Process Troubleshooting in Chemical Plants Training Course

Professional Development Training Course Outline

Category	General Training	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Efficient chemical plant operations hinge on the ability to anticipate, diagnose, and resolve process deviations swiftly. Process Troubleshooting in Chemical Plants Training Course empowers professionals with advanced problem-solving techniques, real-world case studies, and industry-proven methodologies. Participants will gain hands-on experience in identifying root causes, implementing corrective actions, and optimizing plant performance to minimize downtime and maximize profitability.

Designed for engineers, operators, and process managers, this course leverages cutting-edge troubleshooting tools, real-time simulation exercises, and industry best practices. By combining theory with practical insights, attendees will develop the skills required to tackle complex chemical processes, improve operational safety, and enhance process efficiency in today’s competitive chemical industry landscape.

Programme Curriculum

Process Troubleshooting in Chemical Plants Training Course

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5 days

Course Objectives

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

1. Master root cause analysis (RCA) techniques for chemical process issues.
2. Implement advanced process control (APC) strategies for optimized operations.
3. Troubleshoot distillation, reactor, and heat exchanger systems effectively.
4. Analyze process flow diagrams (PFDs) and Piping & Instrumentation Diagrams (P&IDs) for process anomalies.
5. Identify and mitigate safety hazards using HAZOP principles.
6. Optimize chemical reaction efficiency and minimize off-spec production.
7. Apply predictive maintenance and condition monitoring in plant equipment.
8. Develop data-driven decision-making using process simulation and digital twins.
9. Minimize energy consumption and environmental impact through process optimization.
10. Implement continuous improvement techniques such as Six Sigma and Lean principles.
11. Resolve corrosion, fouling, and scaling issues in critical plant equipment.
12. Enhance team-based problem solving for multi-disciplinary plant challenges.
13. Integrate real-time troubleshooting tools with plant automation systems.

Target Audience

1. Chemical Process Engineers
2. Plant Operators and Supervisors
3. Maintenance Engineers and Technicians
4. Production Managers
5. Safety and HSE Professionals
6. Quality Assurance/Control Personnel
7. Technical Consultants in Process Optimization
8. Engineering Graduates aspiring for plant operations expertise

Course Modules

Module 1: Introduction to Process Troubleshooting

- Fundamentals of process troubleshooting in chemical plants
- Common process deviations and their impact
- Importance of **root cause analysis**
- Troubleshooting tools and techniques overview
- Case Study: Reactor performance deviation analysis

Module 2: Process Flow and Instrumentation Analysis

- Reading and interpreting **PFDs and P&IDs**
- Identifying critical control points and bottlenecks
- Signal and control loop analysis
- Process parameter trending and anomaly detection

- Case Study: Distillation column instrumentation failure

Module 3: Root Cause Analysis Techniques

- **5 Whys**, Fishbone, and Fault Tree Analysis
- Data collection and historical trend analysis
- Equipment vs. process fault identification
- Prioritizing corrective actions
- Case Study: Heat exchanger fouling diagnosis

Module 4: Reactor and Unit Operations Troubleshooting

- Key reactor troubleshooting strategies
- Identifying side reactions and yield loss causes
- Distillation column, absorber, and stripper analysis
- Process optimization for unit operations
- Case Study: Reactor temperature excursion handling

Module 5: Advanced Process Control & Optimization

- Implementing **APC and control loops**
- Use of **digital twins** for process simulation
- PID tuning and controller performance evaluation
- Performance benchmarking
- Case Study: APC implementation in a chemical plant

Module 6: Safety, HAZOP, and Risk Management

- HAZOP analysis methodology
- Safety incident troubleshooting
- Risk assessment and mitigation strategies
- Process safety management (PSM) principles
- Case Study: Identifying hazard causes in a chemical plant

Module 7: Maintenance and Equipment Troubleshooting

- Predictive and preventive maintenance strategies
- Equipment degradation and failure analysis
- Troubleshooting pumps, compressors, and heat exchangers
- Maintenance planning for process efficiency
- Case Study: Pump failure root cause analysis

Module 8: Continuous Improvement and Process Analytics

- Lean, Six Sigma, and 5S in chemical plants
- Data-driven performance improvement
- Process efficiency and cost reduction strategies
- Digital tools for ongoing monitoring and analysis
- Case Study: Energy optimization in a chemical unit

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

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