Process Plant Troubleshooting 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

Modern process industries oil & gas, petrochemicals, mining, water treatment, power generation, and manufacturing rely heavily on safe, efficient, and continuous plant operations. Unexpected downtime, equipment failure, process instability, and human error can result in significant financial losses and safety risks. Process Plant Troubleshooting Training Course is designed to equip engineers, technicians, and operations personnel with advanced diagnostic thinking, systematic fault-finding skills, and real-world problem-solving capabilities to ensure high plant reliability, operational excellence, and asset optimization.

This training integrates root cause analysis (RCA), predictive maintenance strategies, condition monitoring, process optimization, and reliability-centered maintenance (RCM) approaches. Participants will learn how to quickly identify deviations, interpret process data, analyze equipment behavior, and implement corrective actions using structured troubleshooting frameworks. The course emphasizes real-world case studies, digital plant diagnostics, and Industry 4.0-enabled monitoring tools, ensuring learners are prepared for modern smart plant environments and data-driven operations.

Programme Curriculum

Process Plant Troubleshooting Training Course

Introduction

Modern process industries oil & gas, petrochemicals, mining, water treatment, power generation, and manufacturing rely heavily on safe, efficient, and continuous plant operations. Unexpected downtime, equipment failure, process instability, and human error can result in significant financial losses and safety risks. Process Plant Troubleshooting Training Course is designed to equip engineers, technicians, and operations personnel with advanced diagnostic thinking, systematic fault-finding skills, and real-world problem-solving capabilities to ensure high plant reliability, operational excellence, and asset optimization.

This training integrates root cause analysis (RCA), predictive maintenance strategies, condition monitoring, process optimization, and reliability-centered maintenance (RCM) approaches. Participants will learn how to quickly identify deviations, interpret process data, analyze equipment behavior, and implement corrective actions using structured troubleshooting frameworks. The course emphasizes real-world case studies, digital plant diagnostics, and Industry 4.0-enabled monitoring tools, ensuring learners are prepared for modern smart plant environments and data-driven operations.

Course Duration

5 days

Course Objectives

1. Master systematic troubleshooting methodologies for complex process plants
2. Apply Root Cause Analysis (RCA) for failure elimination
3. Improve plant reliability and uptime optimization strategies
4. Develop skills in predictive maintenance and condition monitoring
5. Interpret process data analytics and real-time trends
6. Enhance fault diagnosis in rotating and static equipment
7. Implement Lean Manufacturing and Six Sigma problem-solving tools
8. Strengthen process safety management (PSM) awareness
9. Identify and reduce equipment failure modes
10. Apply digital twin and smart plant diagnostics concepts
11. Improve energy efficiency and process optimization techniques
12. Strengthen alarm management and control system troubleshooting
13. Build capability in shutdown, turnaround, and emergency response troubleshooting

Target Audience

1. Process Engineers
2. Maintenance Engineers
3. Plant Operators and Supervisors
4. Reliability Engineers
5. Instrumentation & Control Technicians
6. Mechanical Engineers
7. Production Managers
8. Industrial Safety & Operations Personnel

Course Modules

Module 1: Fundamentals of Process Plant Troubleshooting

- Troubleshooting lifecycle and structured thinking models
- Deviation detection in process operations
- Equipment behavior fundamentals
- Process flow analysis techniques
- **Case Study:** Unexpected plant shutdown due to pressure imbalance in a distillation column

Module 2: Root Cause Analysis (RCA) & Failure Investigation

- 5 Whys technique and Fishbone (Ishikawa) analysis
- Failure mode identification

- Data collection and evidence validation
- Human error vs mechanical failure classification
- **Case Study:** Compressor failure due to lubrication breakdown

Module 3: Rotating Equipment Troubleshooting

- Pumps, compressors, turbines failure modes
- Vibration analysis fundamentals
- Cavitation, misalignment, and wear detection
- Seal and bearing failure diagnostics
- **Case Study:** Centrifugal pump cavitation in refinery operation

Module 4: Static Equipment & Pipeline Troubleshooting

- Heat exchangers fouling and performance issues
- Corrosion and leakage detection methods
- Pressure vessel integrity assessment
- Flow restriction and blockage analysis
- **Case Study:** Heat exchanger efficiency drop due to scaling

Module 5: Instrumentation, SCADA & Control System Faults

- Sensor calibration errors and signal faults
- PLC/SCADA alarm troubleshooting
- Loop tuning and control instability
- Communication failures in automation systems
- **Case Study:** False alarms causing production interruptions in DCS system

Module 6: Process Optimization & Energy Efficiency

- Process parameter optimization techniques
- Energy loss identification
- Lean energy management strategies
- KPI monitoring for plant performance
- **Case Study:** Energy inefficiency in steam distribution system

Module 7: Predictive Maintenance & Condition Monitoring

- Vibration, thermography, and oil analysis
- AI-driven predictive maintenance systems
- Digital twin monitoring concepts
- Asset health indexing
- **Case Study:** Early bearing failure detection using vibration analytics

Module 8: Emergency Troubleshooting & Shutdown Management

- Emergency response decision-making
- Safe shutdown procedures
- Start-up and commissioning troubleshooting
- Crisis communication in plant operations
- **Case Study:** Emergency shutdown due to pipeline rupture prevention protocol

Training Methodology

- 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:

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com