Process Plant Start-up and Shutdown Operations 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

Process Plant Start-up and Shutdown Operations Training Course is designed to equip operators, engineers, and technicians with advanced competencies in safe commissioning, controlled start-up, efficient shutdown, and emergency handling of process plants. This training emphasizes operational excellence, process safety management (PSM), hazard identification (HAZID), HAZOP awareness, SOP compliance, and energy optimization strategies across oil & gas, petrochemical, chemical, power generation, and manufacturing facilities. Participants gain practical insights into minimizing downtime, preventing equipment failure, and ensuring seamless transitions between operating states using globally recognized best practices.

In today's highly regulated industrial environment, mastering start-up sequencing, shutdown protocols, interlock systems, process control logic, and risk-based operational decision-making is critical for maintaining plant integrity and production efficiency. This course integrates real-world case studies, digital plant simulations, incident analysis, and reliability-centered operations to strengthen decision-making skills under dynamic conditions. It also aligns with Industry 4.0 operational standards, predictive maintenance systems, and advanced process control (APC) to improve plant safety, uptime, and productivity.

Programme Curriculum

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Course Duration

5 days

Course Objectives

1. Master safe plant start-up and shutdown procedures
2. Understand process safety management (PSM) frameworks
3. Apply standard operating procedures (SOPs) effectively
4. Identify and control operational hazards and risks
5. Optimize equipment warm-up and cool-down sequences
6. Manage emergency shutdown (ESD) systems efficiently
7. Improve process stability during transitional operations
8. Enhance energy efficiency during plant operations
9. Develop skills in control system monitoring and interlocks
10. Reduce downtime through preventive operational practices
11. Strengthen incident prevention and root cause analysis (RCA)
12. Implement digital and automated plant control strategies
13. Ensure compliance with international safety and environmental standards

Target Audience

1. Process Plant Operators
2. Control Room Engineers
3. Maintenance Technicians
4. Production Supervisors
5. Commissioning Engineers
6. Safety Officers (HSE Professionals)
7. Chemical & Mechanical Engineers
8. Industrial Operations Managers

Course Modules

Module 1: Fundamentals of Process Plant Operations

- Plant types: chemical, oil & gas, power plants
- Basic process flow diagrams (PFDs) and P&IDs
- Equipment overview: pumps, compressors, heat exchangers
- Operational terminology and plant hierarchy
- **Case Study:** Startup failure due to incorrect line-up in refinery unit

Module 2: Start-up Procedures and Sequencing

- Cold start vs hot start operations
- Equipment pre-checks and readiness validation
- Line-up procedures and valve alignment
- Instrument calibration and loop checking
- **Case Study:** Delayed startup in LNG plant due to instrumentation mismatch

Module 3: Shutdown Planning and Execution

- Normal shutdown vs emergency shutdown
- Depressurization and isolation techniques
- Drainage, purging, and flushing systems
- Safe handover to maintenance teams
- **Case Study:** Compressor shutdown mishandling leading to equipment damage

Module 4: Process Safety and Risk Management

- HAZOP and HAZID fundamentals
- Permit-to-work (PTW) systems
- Lockout/Tagout (LOTO) procedures
- Hazardous material handling
- **Case Study:** Chemical leak incident due to bypassed safety interlock

Module 5: Control Systems and Automation

- Distributed Control Systems (DCS) overview
- SCADA monitoring and alarms management
- Interlocks and safeguarding systems
- Advanced Process Control (APC) basics
- **Case Study:** Reactor instability due to control loop failure

Module 6: Emergency Operations and Incident Response

- Emergency shutdown (ESD) activation procedures
- Fire and gas detection systems
- Crisis communication protocols
- Evacuation and containment strategies
- **Case Study:** Refinery flare system activation during pressure surge

Module 7: Energy Optimization and Efficiency

- Energy balancing in start-up/shutdown phases
- Utility management
- Loss minimization techniques
- Process optimization strategies
- **Case Study:** Power plant efficiency loss due to poor shutdown sequencing

Module 8: Reliability and Performance Improvement

- Root cause analysis (RCA) techniques
- Predictive and preventive maintenance integration

- KPI tracking for plant performance
- Continuous improvement methodologies
- **Case Study:** Increased uptime after implementation of predictive shutdown strategy

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

Start Date	End Date	Location	Price
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
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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