Safety in Process Equipment Design and Operation Course

9 – 13 August 2027
Addis Ababa

AGILE LEADERS
Training Center

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Ref: 1387_224550 **Date:** 9 – 13 August 2027 **Location:** Addis Ababa **Fees:** 4500 Euro

Overview

Safety in Process Equipment Design and Operation Course is a one-week advanced course for process safety, engineering, integrity, operations, and maintenance professionals who leave with a Process Equipment Safety Pack. Participants apply process equipment design safety, operational safety controls, mechanical integrity interfaces, safe operating limits, and design-to-operation verification to prevent gaps between engineering intent and field practice. Agile Leaders Training Center presents process equipment safety as a lifecycle engineering and operating discipline.

Who Should Attend

- Functions responsible for process equipment design basis and technical assurance
- Teams that evaluate process hazards, failure modes, and safeguards
- Functions responsible for equipment reliability, inspection, and integrity decisions
- Operations teams that control startup, shutdown, and abnormal conditions
- Maintenance teams that plan interventions and restore equipment safely
- Functions responsible for change control and operational readiness

The course assumes participants already work with process equipment, engineering documents, operating procedures, inspection records, or hazard reviews and leaves out introductory occupational safety and jurisdiction-specific compliance.

Departments and Industries

The course serves departments and industries that design, operate, inspect, and maintain process equipment.

- Process engineering, mechanical engineering, and technical assurance functions
- Oil, gas, chemical, and energy operations
- Utilities, water treatment, and industrial manufacturing facilities
- Asset integrity, reliability, and inspection teams
- Operations, maintenance, and turnaround functions
- Process safety, project, and commissioning teams

Learning Objectives

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

- Analyze equipment design bases and service conditions
- Evaluate failure modes and engineered safeguards
- Build safe operating limit and deviation controls
- Diagnose inspection, integrity, and maintenance interface gaps
- Apply change control and operational readiness checks
- Integrate design-to-operation verification evidence

Course Agenda

Day 1: Equipment Safety Basis

- Process Equipment Design Basis Register
- Equipment Boundary and Service Conditions Matrix
- Material Compatibility and Containment Review Method
- Design Hazard Review Plan
- Engineering-Operations Responsibility Interface Map

Day 2: Failure Modes and Safeguards

- Equipment Failure Mode and Effect Review
- Overpressure and Relief Scenario Register
- Isolation and Containment Safeguard Map
- Rotating and Static Equipment Protection Checklist
- Alarm, Interlock, and Operator Response Matrix

Day 3: Operating Envelopes and Integrity

- Safe Operating Limit Register
- Startup and Shutdown Risk Review Method
- Abnormal Operation Response Guide
- Inspection and Maintenance Interface Plan
- Equipment Degradation and Integrity Evidence Record

Day 4: Change and Readiness Verification

- Equipment Change Impact Assessment
- Pre-Startup Safety Review Checklist
- Safeguard Verification Test Plan
- Design-to-Operation Handover Dossier
- Equipment Exception and Action Closeout Log

Day 5: Process Equipment Safety Practice

- Exercise: Validate an Equipment Design Basis
- Exercise: Map Failure Modes to Safeguards
- Exercise: Diagnose an Operating Envelope Deviation
- Exercise: Test Change and Readiness Evidence
- Capstone Exercise: Process Equipment Safety Pack

Practical Exercises

The course uses chemical processing, energy, water treatment, and manufacturing equipment scenarios.

- Suggested activity: reconcile design basis, service conditions, materials, boundaries, and ownership in an equipment safety record.
- Suggested activity: connect credible failure modes to relief, isolation, alarm, interlock, and operator safeguards.
- Suggested activity: analyze startup, shutdown, abnormal operation, inspection, and degradation evidence against safe operating limits.
- Suggested activity: integrate change review, readiness checks, handover evidence, and closeout actions into a Process Equipment Safety Pack.

FAQs

Who suits process equipment design and operation safety training, and what does it assume?

Process equipment design and operation safety training suits professionals who already work with equipment specifications, process hazards, operating procedures, inspection records, maintenance decisions, or technical assurance.

How does process equipment safety training differ from general process safety management training?

Process equipment safety training concentrates on equipment design basis, failure modes, safeguards, operating envelopes, integrity interfaces, and readiness evidence rather than the wider management system.

What are safe operating limits for process equipment?

Safe operating limits define the acceptable conditions for equipment operation and support clear recognition, response, and escalation when pressure, temperature, flow, level, or other critical conditions deviate.

How does mechanical integrity support process equipment operational safety?

Mechanical integrity supports operational safety by connecting equipment identification, inspection, testing, maintenance, deficiency management, and documented acceptance criteria to the intended service.

Why is design-to-operation verification important for process equipment?

Design-to-operation verification checks that equipment, safeguards, documents, procedures, training, and outstanding actions support safe startup and continued operation.

Conclusion

The course integrates equipment design basis, failure analysis, safeguards, operating envelopes, integrity evidence, change control, and readiness verification. Participants take back a Process Equipment Safety Pack that connects engineering intent with operational decisions. The pack strengthens technical handover, deviation control, inspection interfaces, and action closeout across the equipment lifecycle.