QUEST
Professional Center

PROFESSIONAL TRAINING COURSE

Course No. 1346

Process Troubleshooting, Debottlenecking & Yield Improvement

PROCESS ENGINEERING
INDUSTRIAL ENGINEERING, MAINTENANCE & OPERATIONS

DURATION
5 Days

DELIVERY
Classroom

LOCATION
London, United Kingdom

DATES
30 Nov – 4 Dec 2026

Scheduled Event Details

CITY	London, United Kingdom
DATE	30 Nov – 4 Dec 2026
DELIVERY TYPE	Classroom
COURSE FEE	€5,800

Course Overview

The Process Troubleshooting, Debottlenecking & Yield Improvement Training Course provides a practical and systematic framework for improving process performance, resolving operational problems, and increasing yield across industrial, utility, manufacturing, and asset-intensive environments. The course equips participants with the methods needed to identify the causes of variability, losses, constraints, and underperformance that affect production, quality, energy use, reliability, and operating cost.

Organizations in oil and gas, petrochemicals, power, water, utilities, manufacturing, mining, transport, and major infrastructure operations often face challenges such as reduced throughput, unstable quality, recurring equipment interruptions, excessive energy consumption, material losses, delayed process flow, and inconsistent operating practices. Effective troubleshooting and debottlenecking enable organizations to move beyond treating symptoms and instead use operational evidence, process data, engineering analysis, and cross-functional knowledge to address the real sources of performance loss.

This Process Troubleshooting, Debottlenecking & Yield Improvement Training Course covers the full improvement process, from defining the problem and establishing a performance baseline to collecting and analyzing data, mapping process flows, identifying constraints, developing solutions, testing changes, and verifying results. Participants will learn how to use process flow analysis, trend analysis, Pareto analysis, root cause analysis, mass and energy balances, capacity assessment, and operational performance review to make decisions based on facts.

The course focuses on bottlenecks as the equipment, process step, resource, control limit, procedure, or operational condition that constrains overall system performance. Participants will learn how to distinguish genuine bottlenecks from secondary or temporary issues, assess their impact on throughput and yield, and prioritize improvement opportunities according to safety, quality,

technical feasibility, operational risk, cost, and expected benefit.

Through case discussions, practical exercises, and implementation workshops, participants will develop the capability to build realistic troubleshooting, debottlenecking, and yield improvement plans. The course supports executives and managers in making informed operational and investment decisions, while providing engineers, supervisors, specialists, and technical teams with practical tools for improving process flow, reducing waste, increasing yield, and sustaining operational performance.

Objectives

- Analyze process performance and relate throughput, yield, quality, energy use, reliability, and operating cost to relevant operational indicators during the course.
- Assess operational, production, maintenance, quality, and process-control data to identify performance deviations, variability, and improvement opportunities.
- Develop a clear and measurable problem statement that defines the operational issue, scope, impact, baseline, and improvement objective.
- Apply process troubleshooting methods to identify technical, procedural, human, organizational, and equipment-related causes of underperformance.
- Design process, material, energy, and information flow maps that reveal constraints, delays, losses, rework, and non-value-adding activities.
- Evaluate actual and potential bottlenecks according to capacity, throughput, cycle time, equipment availability, quality impact, and resource utilization.
- Apply mass and energy balance principles to assess losses, yield performance, material efficiency, and energy utilization in practical scenarios.
- Develop debottlenecking and yield improvement options while considering safety, quality, reliability, cost, operational risk, and ease of implementation.
- Improve process performance by reviewing operating set points, equipment loading, sequencing, start-up practices, shutdown routines, and control methods.
- Implement a structured approach for testing improvement actions, verifying results, documenting learning, and managing operational change.
- Strengthen collaboration between operations, engineering, maintenance, reliability, quality, and energy management through common analysis and review practices.
- Develop a time-bound action plan to improve process troubleshooting, debottlenecking, and

yield performance after the course.

Who Should Attend

The Process Troubleshooting, Debottlenecking & Yield Improvement Training Course is designed for operations managers, production managers, engineering managers, maintenance managers, reliability managers, quality managers, energy managers, utilities managers, asset managers, plant managers, project managers, and technical services leaders. It is particularly relevant for executives, directors, and decision makers responsible for throughput, yield, product or service quality, operating efficiency, energy performance, asset availability, operational resilience, and cost control.

The course is suitable for process engineers, production engineers, chemical engineers, mechanical engineers, electrical engineers, instrumentation and control engineers, maintenance engineers, reliability engineers, utilities engineers, energy engineers, quality engineers, technical analysts, operations supervisors, production supervisors, planners, and continuous improvement specialists. It supports professionals working in oil and gas, petrochemicals, energy, water and utilities, manufacturing, mining, food and beverage, pharmaceuticals, transport, and other environments involving interconnected equipment, processes, and operational systems.

HSE, supply chain, procurement, finance, risk management, internal audit, project management, digital transformation, data management, and operational excellence professionals may also benefit where their responsibilities involve process risk, operating cost, resource use, asset performance, material availability, performance reporting, capital investment, or improvement governance. The course is especially valuable for teams experiencing reduced output, unstable process conditions, low yield, repeated equipment downtime, high energy or material consumption, delayed delivery, or recurring constraints in critical processes.

Learning Outcomes

- Explain the relationship between process troubleshooting, debottlenecking, yield improvement, quality, reliability, energy efficiency, and operational performance.
- Define operational problems clearly by identifying the impact, scope, baseline, performance target, and analysis requirements.
- Collect and interpret production, operational, maintenance, quality, and control-system data to identify trends, deviations, and variability.

- Develop process, material, energy, and information flow maps that reveal constraints, losses, delays, and performance gaps.
- Identify actual bottlenecks and distinguish them from secondary constraints, temporary restrictions, and isolated equipment issues.
- Assess the effect of bottlenecks on throughput, cycle time, yield, quality, energy use, equipment availability, and operating cost.
- Apply mass and energy balance principles to identify material losses, inefficiencies, and improvement opportunities.
- Use Pareto analysis, trend analysis, variance analysis, and root cause analysis to develop and test practical improvement hypotheses.
- Develop options to improve process capacity, flow, operating conditions, equipment readiness, control settings, and work sequencing.
- Evaluate proposed solutions using safety, quality, technical feasibility, risk, resource, cost, and lifecycle considerations.
- Prepare a trial, implementation, and verification plan with clear owners, measures, milestones, and effectiveness criteria.
- Produce an initial process troubleshooting, debottlenecking, and yield improvement roadmap for the participant’s workplace.

Course Outline

DAY 01

Process Performance and Troubleshooting Foundations

- Process performance concepts and the relationship between throughput, yield, quality, energy use, reliability, and operating cost.
- Defining operational problems, setting the scope, establishing baselines, selecting performance indicators, and setting measurable objectives.
- Data sources for process troubleshooting: operating records, production information, quality results, maintenance history, control-system data, and field observations.
- A structured troubleshooting approach: observation, data validation, hypothesis development, cause analysis, solution testing, and performance verification.

DAY 01 — CONTINUED

> **PRACTICAL APPLICATION OR DISCUSSION**
>
> Identifying a priority process-performance issue and preparing a problem statement and initial data collection plan.

DAY 02

Process Flow Analysis and Bottleneck Identification

- Process, material, energy, and information flow mapping to understand system interaction and process behaviour.
- Capacity, throughput, cycle time, work in progress, resource utilization, and the theory of constraints.
- Identifying genuine bottlenecks, shifting bottlenecks, and constraints related to equipment, materials, procedures, skills, utilities, and process controls.
- The effect of downtime, waiting, rework, quality variation, supply constraints, and poor coordination on process flow.

> **PRACTICAL APPLICATION OR DISCUSSION**
>
> Developing a process flow map and analyzing bottlenecks for a selected process, unit, facility, or production line.

DAY 03

Data Analysis, Yield Improvement, and Resource Efficiency

- Trend analysis, variance analysis, Pareto analysis, and data segmentation for identifying high-priority sources of loss.
- Mass and energy balances for evaluating inputs, outputs, losses, yield, material efficiency, and energy performance.
- Yield, quality, reprocessing, rejects, waste, emissions, and their relationship to process performance.
- Process control, set points, operating envelopes, equipment conditions, and their effect on stability and yield.

DAY 03 — CONTINUED

PRACTICAL APPLICATION OR DISCUSSION

Reviewing sample yield data, identifying loss mechanisms, and developing measurable improvement opportunities.

DAY 04

Debottlenecking and Solution Development

- Debottlenecking strategies: operational optimization, workload redistribution, scheduling improvement, downtime reduction, process redesign, and capacity enhancement.
- The contribution of maintenance and reliability to improving critical equipment availability and reducing unplanned interruptions.
- Optimizing operating sequences, equipment loading, control settings, start-up, shutdown, cleaning, changeover, and utility use.
- Evaluating alternatives through safety, quality, technical feasibility, operating impact, risk, cost, and lifecycle value.

PRACTICAL APPLICATION OR DISCUSSION

Developing and prioritizing debottlenecking options for a process-performance scenario.

DAY 05

Implementation, Verification, and Continuous Improvement

- Developing implementation plans that define improvement scope, responsibilities, resources, schedules, communication, and risk controls.
- Testing solutions and verifying results using throughput, yield, quality, energy, reliability, and cost performance indicators.
- Managing operational change, updating procedures, revising maintenance plans, maintaining data records, and supporting workforce readiness.
- Performance governance, management reviews, action tracking, lessons learned, and sustained process improvement.

DAY 05 — CONTINUED

FINAL WORKSHOP, ACTION PLAN, OR IMPLEMENTATION EXERCISE

Developing a 90-day Process Troubleshooting, Debottlenecking & Yield Improvement action plan with priority issues, solutions, accountable owners, milestones, performance measures, and review mechanisms.

Register or Request More Information

Course page: https://quest-training.com/courses/process-troubleshooting-debottlenecking-yield-improvement
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