

Course No. 1358

Integrated Commissioning for Major Industrial Projects Training Course

COMMISSIONING, START-UP & SHUTDOWN & OPERATIONAL
READINESS
INDUSTRIAL ENGINEERING, MAINTENANCE & OPERATIONS

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The Integrated Commissioning for Major Industrial Projects Training Course is a comprehensive professional program designed to develop the technical, operational, coordination, and management capabilities required to plan and execute integrated commissioning activities across complex industrial projects. The course focuses on the transition from engineering and construction completion to operational readiness, commissioning, start-up, performance verification, and final handover, with particular attention to system integration, project interfaces, risk management, and operational performance.

Integrated commissioning is a critical stage in major industrial projects because multiple disciplines, systems, contractors, technologies, and operational teams must work together before a facility can safely enter service. Mechanical, electrical, instrumentation, control, process, utility, safety, and communication systems must be progressively tested and integrated to confirm that the complete facility performs as intended. A structured commissioning approach helps organizations identify deficiencies early, reduce project risks, improve handover quality, and establish reliable operational conditions.

The program provides participants with a complete view of the commissioning lifecycle, covering commissioning strategy, planning, systemization, turnover, readiness assessment, pre-commissioning, functional testing, integrated system testing, energization, start-up, performance verification, and final acceptance. It also addresses the interfaces between engineering, procurement, construction, commissioning, operations, maintenance, quality, inspection, project controls, and health and safety functions.

A major focus of the course is the integration of commissioning activities across multiple contractors, disciplines, and work packages. Participants will examine how to establish clear system boundaries, define commissioning priorities, control outstanding work, manage interfaces, track readiness, coordinate testing sequences, and maintain effective communication throughout the project. The course also addresses practical challenges such as incomplete work, technical deviations, late design changes, documentation gaps, equipment problems, and competing project priorities.

Through practical applications, case studies, workshops, and project-based exercises, participants will learn how to develop integrated commissioning strategies, assess project readiness, coordinate

multidisciplinary commissioning activities, manage risks, resolve interface issues, and support a controlled transition into operations. The Integrated Commissioning for Major Industrial Projects Training Course supports organizations seeking to strengthen commissioning governance, improve project delivery, increase operational readiness, and achieve a more effective transition from project execution to sustainable operations.

Objectives

- Analyze the complete integrated commissioning lifecycle for major industrial projects and identify key activities, interfaces, deliverables, and decision points throughout the training program.
- Develop integrated commissioning strategies and execution plans that align engineering, construction, testing, start-up, and operational readiness requirements.
- Evaluate system boundaries, commissioning priorities, work packages, and turnover requirements to establish an effective commissioning sequence.
- Apply structured methods for pre-commissioning, functional testing, integrated system testing, energization, start-up, and performance verification.
- Design commissioning readiness reviews, checklists, status controls, and reporting mechanisms that support informed project decisions.
- Improve coordination between engineering, procurement, construction, commissioning, operations, maintenance, quality, inspection, and safety teams.
- Strengthen the management of project interfaces, system handovers, outstanding work, technical queries, and cross-disciplinary dependencies during commissioning.
- Assess commissioning risks, operational constraints, safety requirements, and potential failure points and establish appropriate mitigation measures.
- Implement practical approaches for managing commissioning progress, documenting test results, tracking deficiencies, and closing outstanding actions.
- Align integrated commissioning activities with project schedules, operational readiness requirements, maintenance strategies, and asset management objectives.
- Develop structured approaches for troubleshooting commissioning problems and resolving technical and coordination issues affecting start-up.
- Evaluate final commissioning performance and establish effective handover processes that support stable and sustainable operations.

Who Should Attend

This course is designed for commissioning engineers, project engineers, construction engineers, process engineers, mechanical engineers, electrical engineers, instrumentation and control engineers, operations engineers, maintenance engineers, reliability professionals, and technical specialists involved in major industrial projects. It is particularly relevant to professionals working on oil and gas facilities, petrochemical plants, power generation projects, utilities, manufacturing facilities, infrastructure projects, processing plants, and other complex industrial developments.

The program is also suitable for project managers, commissioning managers, construction managers, engineering managers, operations managers, maintenance managers, project controls professionals, quality managers, inspection personnel, HSE professionals, system completion managers, turnover coordinators, and discipline leads responsible for coordinating project completion and operational readiness. It is valuable for executives and decision makers who oversee major capital projects and require greater visibility into commissioning progress, readiness, risks, and the transition to operations.

Government entities, ministries, public sector organizations, energy companies, industrial corporations, engineering and project organizations, and large asset-owning organizations can benefit from this training when establishing or improving integrated commissioning frameworks for major projects, expansions, modernization programs, and new facility developments.

Learning Outcomes

- By the end of the course, participants will be able to:
- Explain the principles, stages, and governance requirements of integrated commissioning for major industrial projects.
- Develop a structured commissioning strategy that connects project completion, system turnover, testing, start-up, and operational readiness.
- Define commissioning system boundaries and organize complex facilities into manageable systems and subsystems.
- Establish commissioning priorities, sequencing, readiness criteria, and key decision points for major project activities.
- Apply practical approaches to pre-commissioning, functional testing, integrated system testing, energization, and start-up.

- Evaluate the readiness of mechanical, electrical, instrumentation, control, utility, process, and safety systems before commissioning.
- Manage project interfaces and coordinate multidisciplinary teams throughout system completion and commissioning.
- Use commissioning dashboards, status tracking, readiness reviews, and progress reports to monitor project performance.
- Identify and manage technical risks, incomplete work, deficiencies, non-conformities, and interface issues affecting commissioning.
- Analyze commissioning and test results to identify performance gaps and determine appropriate corrective actions.
- Develop structured handover documentation and verify that operational, maintenance, and technical requirements are satisfied.
- Prepare an integrated commissioning implementation plan that supports safe start-up, operational stabilization, and final project acceptance.

Course Outline

DAY 01

Integrated Commissioning Strategy and Project Readiness

- Fundamentals of integrated commissioning for major industrial projects
- The role of commissioning within the overall project lifecycle
- Transition from engineering and construction to commissioning and operations
- Commissioning strategy, philosophy, objectives, and governance
- Development of commissioning organization structures and responsibilities
- Systemization, system boundaries, and identification of commissioning systems
- Defining commissioning priorities, milestones, and decision gates
- Integration of commissioning activities with the project execution schedule
- Key interfaces between engineering, construction, commissioning, operations, and maintenance

PRACTICAL APPLICATION

Developing an integrated commissioning strategy for a major industrial project

DAY 02

System Completion, Turnover, and Pre-Commissioning

- Mechanical completion and system completion principles
- System turnover and documentation requirements
- Development and management of completion and handover packages
- Pre-commissioning planning and readiness requirements
- Inspection and verification of equipment, piping, electrical systems, and instrumentation
- Management of punch list items and outstanding work
- Cleaning, flushing, pressure testing, calibration, and functional checks
- Verification of utilities and supporting systems
- Readiness assessment for critical systems and equipment

PRACTICAL APPLICATION

Conducting a multidisciplinary readiness review and developing a system turnover plan

DAY 03

Multidisciplinary Commissioning and Integrated System Testing

- Functional testing of mechanical and process systems
- Electrical system commissioning and energization planning
- Instrumentation and control system commissioning
- Testing of alarms, trips, interlocks, and protective functions
- Integrated testing across interconnected systems
- Coordination of utilities, process systems, control systems, and safety systems
- Development of commissioning test procedures and acceptance criteria
- Managing testing sequences and multidisciplinary dependencies
- Recording, evaluating, and approving commissioning results

CASE STUDY

Coordinating an integrated commissioning sequence across multiple plant systems

DAY 04

Commissioning Risk Management, Troubleshooting, and Start-up

- Identification and assessment of commissioning and start-up risks
- Process safety and operational risk considerations during commissioning
- Permit-to-work, isolation, energy control, and safe system energization
- Managing simultaneous operations and conflicting work activities
- Management of Change during commissioning and start-up
- Troubleshooting equipment and system failures
- Root cause analysis of commissioning problems and performance deviations
- Managing technical queries, non-conformities, and corrective actions
- Communication and decision-making during critical commissioning activities

PRACTICAL APPLICATION

Analyzing a complex commissioning problem and developing a coordinated recovery plan

DAY 05

Performance Verification, Handover, and Operational Readiness

- Integrated performance testing and verification of project requirements
- Evaluation of commissioning results against design and operational criteria
- Monitoring start-up performance and identifying remaining constraints
- Commissioning documentation, records, and final reporting
- Close-out of punch list items, technical observations, and outstanding work
- Preparation of operations and maintenance handover packages
- Operational readiness, training, procedures, and organizational preparation
- Integration of commissioning results with maintenance, reliability, and asset management requirements
- Lessons learned, commissioning performance review, and continuous improvement

DAY 05 — CONTINUED

FINAL WORKSHOP

Developing a complete Integrated Commissioning Implementation Plan for a major industrial project, including systemization, readiness, testing, risk management, start-up, performance verification, and final handover

Register or Request More Information

Course page: <https://quest-training.com/courses/integrated-commissioning-for-major-industrial-projects-training-course>

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