Building Commissioning: MEP Functional Testing, Retro-Commissioning and Handover

5 – 9 April 2027
Amsterdam - Zuidas business district hotel



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Introduction:

Building commissioning is where owners discover whether chillers, air handlers, switchboards, fire alarms and controls actually work together as the design intended. When the Owner's Project Requirements are vague, test scripts are written late and the issues log is left open, buildings reach occupancy with hot zones, nuisance alarms and untrained operators. This Core Concept course builds practical skill in the whole-building commissioning process for MEP systems, from OPR and Basis of Design to functional performance testing, seasonal checks and retro-commissioning. Participants produce a Building Commissioning Plan and Functional Test Pack.

Course Objectives:

- Define commissioning scope, team roles and deliverables for a new or existing building using the ASHRAE Guideline 0 process
- Write and review Owner's Project Requirements and Basis of Design documents that give the design team measurable acceptance criteria
- Review design documents and equipment submittals for commissionability, access, controls points and testability
- Prepare pre-functional checklists and functional performance test scripts for HVAC, electrical, fire and life safety and BMS systems
- Verify TAB reports, witness integrated systems tests and drive the commissioning issues log to closure
- Plan operator training, systems manual handover, seasonal testing and retro-commissioning of occupied buildings

Target Audience:

- Mechanical and electrical engineers responsible for designing or installing building services that must pass acceptance
- Commissioning providers responsible for planning, witnessing and reporting on building systems tests
- Facility and operations staff responsible for accepting, running and maintaining handed-over buildings
- Owner-side project engineers responsible for construction quality and handover of new facilities
- Controls and BMS technicians responsible for sequences of operation, trending and point-to-point checks

Course Outline:

Day 1: Commissioning Process, Roles and Owner Requirements

- Commissioning Types Compared: New Construction Cx, Retro-Commissioning, Re-Commissioning and Ongoing Cx
- Commissioning Team Structure: Owner, Commissioning Provider, Designer, Contractor and Operator Roles
- Owner's Project Requirements Workshop Template and Measurable Acceptance Criteria
- Basis of Design Document Structure and Traceability to the OPR
- Commissioning Maturity Assessment of a Current Project Portfolio

Day 2: Commissioning Standards, Plans and Specifications

- ASHRAE Guideline 0 Commissioning Process Phases from Pre-Design to Occupancy
- ASHRAE Standard 202 Minimum Requirements and ASHRAE Guideline 1.1 for HVAC&R Systems
- Commissioning Plan Contents: Schedule, Systems List, Communication Protocol and Sampling Strategy
- Division 01 Commissioning Specification Clauses and Contractor Cx Responsibilities
- Design Review and Submittal Review Checklists for Commissionability and Maintainability

Day 3: Pre-Functional Checks, Functional Testing and TAB

- Pre-Functional Checklists for Chillers, Air Handling Units, Pumps and Fan Coil Units
- Functional Performance Test Scripts: Modes, Setpoints, Failure Responses and Pass Criteria
- TAB Report Verification: Air and Water Flow Readings and Spot-Check Sampling
- BMS Point-to-Point Checks, Sequence of Operations Testing and Trend Log Analysis
- Electrical Systems Functional Tests: Generator Transfer, UPS Runtime and Lighting Controls

Day 4: Integrated Systems Testing, Issues and Existing Buildings

- Integrated Systems Testing: Fire Alarm, Smoke Control, Lifts and HVAC Shutdown Cause and Effect Matrix
- ASHRAE Guideline 1.5 Smoke Control Commissioning at Overview
- Commissioning Issues Log: Severity Rating, Ownership, Retest and Closure Rules
- Seasonal and Deferred Testing Plans for Peak Cooling and Part-Load Conditions
- Retro-Commissioning Under ASHRAE Standard 230 and Guideline 0.2: Investigation and Low-Cost Measures

Day 5: Handover, Green Building Links and Commissioning Case Work

- Systems Manual and O&M Documentation Handover per ASHRAE Guideline 1.4
- Operator Training Plan, Attendance Records and Warranty Phase Review
- Commissioning Requirements in Green Building Rating Systems and Envelope Cx under NIBS Guideline 3 at Overview
- Hospital and Office Tower Cases: Failed Functional Tests and Late Handover Recovery
- Building Commissioning Plan and Functional Test Pack Drafting and Peer Review

Skills You Will Gain:

- Owner Requirements Definition
- Commissionability Review
- Functional Test Scripting
- TAB Data Verification
- Controls Sequence Validation
- Integrated Systems Testing
- Issues Log Management
- Retro-Commissioning Investigation

Why Attend This Course:

- Return with a Building Commissioning Plan and Functional Test Pack prepared for a building from your own project or estate
- Catch missing controls points, inaccessible dampers and untestable designs at review stage rather than during occupancy
- Hand over buildings with trained operators, a complete systems manual and an issues log closed to agreed rules
- Compare commissioning practice with MEP and facilities peers from healthcare, commercial, hospitality, education and data centre projects

Conclusion:

Buildings perform as intended when commissioning starts with clear owner requirements and ends with trained operators and closed issues. The one week move from commissioning roles, OPR and Basis of Design, through ASHRAE Guideline 0 and Standard 202 plans and specifications, to pre-functional checklists, functional tests, TAB verification and BMS sequence checks. Integrated systems testing, issues management, seasonal testing and retro-commissioning follow, before case work produces a Building Commissioning Plan and Functional Test Pack ready for the next project.