

SECTION 3-10 COMMISSIONING

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3-10-00 POLICY

This section describes the HHS policy and procedures for commissioning on all major renovation and construction projects for federally-owned real property assets. Each OPDIV will develop, implement and maintain a commissioning process for all new and renovated facilities that meet or exceed the Capital Investment Review Board threshold (\$10M). In developing the commissioning process, OPDIVs shall employ commissioning practices tailored to the size and complexity of the building and its systems components. For projects below the HHS major capital construction threshold, the complexity and nature of the facility will determine the level of commissioning appropriate to meet the intent of Executive Order 13514 *Federal Leadership in Environmental, Energy and Economic Performance*.

Commissioning is the process of making sure all building systems are working when occupants move in. It involves making sure all systems are: installed properly and perform according to design; cost effective; meet the users' needs; adequately documented and well understood by operators. Commissioning serves to accomplish the following goals:

- Reduced number of deficiencies at completion.
- Lower utility costs attributable to efficiently operating systems.
- Lower maintenance costs due to properly trained maintenance crew.
- Higher productivity of the building occupants because of properly balanced ventilation system.
- Design for Maintainability.
- Reduced outages and downtimes due to better diagnosis of failures.
- Well-documented and successful system tests.
- All building systems perform in accordance with the design requirements.

Retro-commissioning, re-commissioning and continuous commissioning for existing facilities are addressed in Volume II, Section 4-12 of this Manual.

3-10-10 PROCEDURES

- A. Each OPDIV will develop a commissioning process utilizing industry wide standards such as ASHRAE Guideline 0-2005, "The Commissioning Process." The process should include an experienced commissioning provider, inclusion of commissioning requirements in construction documents, a commissioning plan, verification of the installation and

performance of systems to be commissioned and a commissioning report. The process will include the early programming phases of the project and extend through the end of the warranty phase for the facility.

A draft of the ASHRAE Guideline 0-2005 can be downloaded at the following link.

<http://www.nccx.org/LinkClick.aspx?link=ASHRAE+Guideline+1+draft.pdf&tabid=78&mid=411>

The final version can be purchased at the ASHRAE website.

- B. Each OPDIV will develop a plan to implement the commissioning process. The implementation will include staff training to ensure clear understanding of the process. Commissioning requirements will apply to any applicable project with a design start date after the implementation of the OPDIV's Commissioning process.
- C. The OPDIV will continue to maintain the process by:
- Ensuring that appropriate funding is requested within each project budget.
 - Reviewing the projects and process to determine if the aforementioned goals are being met.
 - Updating the process appropriately to ensure continual improvement.
- D. OPDIVS should draw from their own technical expertise, knowledge of each facility and industry standards available to develop their commissioning process. This document is general in nature and not to be considered a manual to develop a commissioning process.

3-10-20 GUIDANCE AND INFORMATION

Commissioning functions as an advocacy service to the OPDIVS. Rigorous operational testing provides a high level of assurance that building systems are properly installed and will operate within performance guidelines set forth in the design documents.

A. Quality Assurance for Building Systems

Commissioning affords the owner an unbiased expert's perspective of a building's system installation, operation, and performance and provides for monitoring of specified building system service training events. The commissioning process does not alter the responsibilities of design professionals, installing contractors or their vendors, but rather augments the efforts of all parties toward the common goal of achieving a quality-building product. It promotes the delivery of a safe, healthy environment for building occupants by turning over functionally tested building systems with appropriate documentation and training for owners and operators. Commissioning, with its quality management focus, should be part of the project from its inception because an early start provides maximum benefits. Commissioning bridges the gaps between the Government, the design team, the construction team and building system vendors using a methodical process employing:

- Identifying and documenting the needs and the requirements of the facility to ensure that the designed systems are efficient, cost effective and commensurate with the identified needs.

- Thorough review of design and submittal documents.
- Ensuring that the systems installed are operable and maintainable.
- Functional performance testing of the systems to ensure that they are interacting and performing optimally.
- Progress and coordination meeting attendance.
- Resolution tracking forms.
- System verification checks.
- Start-up and operator involvement for HVAC equipment.
- Functional performance testing.
- O&M and as-built documentation corroboration.
- Specified factory service and off-season mode testing enforcement.
- O&M training facilitation and recording.
- Ensuring that the design intent, the installations and the O&M requirements are clearly and thoroughly documented.
- Training of the operators and the facility staff to ensure they operate and maintain the facility per the design intent..
- Integration of subsystems.

B. Functions and Responsibilities of the Commissioning Agent

The methodology for carrying out a comprehensive commissioning process is organized by project phase: pre-design, design, construction, acceptance, and finally post-acceptance. The functions and responsibility of the Commissioning Agent during each phase shall include:

- Share Information - The primary responsibility is to inform the General Contractor (Construction Manager), the Government and A/E on the status, integration, and performance of systems within the facility. The Commissioning Agent shall function as a catalyst and initiator to disseminate information and assist the design and construction teams in the completion of the construction process. This shall include system completeness, performance, and adequacy to meet the intended performance of each system. Services include construction observation, spot testing, verification and functional performance testing, and providing performance and operating information to the responsible parties.
- Quality assurance - Assist the responsible parties in maintaining a high quality level of installation and system performance.
- Observation of testing - The Commissioning Agent shall observe and coordinate testing as required to ensure system performance meets the design intent. The construction contractor performs testing required by the contract to ensure that the facility meets or

exceeds the contract requirements. The Commissioning Agent doesn't coordinate the construction contractor's work but does verify required systems and component testing has been performed by the construction contractor.

- Documentation of tests - The Commissioning Agent shall document the results of the performance testing directly or ensure that the appropriate technicians document all testing. The Commissioning Agent shall provide standard forms to be used by all parties for consistency of approach and type of information to be recorded.
- Technical Expertise - The Commissioning Agent shall provide technical expertise to review and edit operating and maintenance descriptions by systems.
- Deficiencies - The Commissioning Agent shall provide technical expertise to oversee and verify the correction of deficiencies found during the commissioning process.
- Acceptance - The Commissioning Agent shall work with and advise the Construction Manager, Government, and A/E concerning the date of acceptance for each system for the start of the warranty period (if different than the overall Beneficial Occupancy Date).

C. COMMISSIONING PHASES

Suggested objectives for each commissioning phase are outlined below.

1. Program & Pre-design commissioning phase

Document initial design intent

Develop commissioning plan

- Document requirements as specified in Owner's program
- Select commissioning Agent

2. Design Commissioning Phase

- Ensure clear design intent documents are developed
- Develop commissioning plan & specifications
- Coordinate building systems with HVAC equipment & systems

3. Construction Commissioning Phase

- Verify system/equipment start-up and operation
- Verify building management controls
- Verify Testing Adjusting & Balancing report
- Document all tests, observations, and issues
- Verify system installation
- Verify installed equipment is maintained in accordance with O&M while project is under construction and prior to final acceptance
- Coordinate as-built drawings
- Coordinate O&M training

4. Acceptance Commissioning Phase

- Enforcement of Warranty
- Verify functional testing of all systems
- Verify all systems comply with contract documents
- Verify accuracy of final TA&B report
- Conduct O&M training
- Complete systems manual
- Complete training program
- Review and verify the contractor's commissioning related as-built documents

5. Post Acceptance Commissioning Phase

Shall be done before warranties expire

- Continued adjustment, optimization of the building systems
- Maintain performance of the systems per the contract requirements
- Revision of as-built records
- Testing, adjusting & balancing of affected systems

D. The Commissioning Report

The commissioning report will generally consist of the following:

- Detailed narrative of commissioning results.
- Verification checklist data sheets.
- Functional performance test data records.
- System operation description and final design intent.
- As built drawings/ shop drawings.
- Final updated operation & maintenance manuals.
- Training documents.

These records will be beneficial to the owner for as long as the building serves its occupants. The records are helpful to the maintenance personnel that operate and maintain the equipment. The records would also be helpful to the OPDIVS should there be any question regarding air quality and working environment.