

(This annex is not a mandatory part of the referring ASHRAE SSPC 300 standard or guideline. It is merely informative and does not contain requirements necessary for conformance to the standard or guideline.)

(The following informative annex is provided to illustrate, explain, or support the ASHRAE SSPC 300 commissioning process. The information presented herein represents consensus good practice but does not contain mandatory commissioning process provisions. This informative annex supports more than one ASHRAE SSPC 300 commissioning standard or guideline and is not intended to serve as a standalone document. See the referring ASHRAE SSPC 300 standard or guideline for mandatory commissioning process requirements and guidance.)

ASHRAE SSPC 300 INFORMATIVE ANNEX 03—INITIATING THE COMMISSIONING PROCESS

Commissioning is a team effort, and the entire Project Team is part of the Cx. The Cx Plan summarizes the Project Team's roles and responsibilities defined in the contract documents and professional services agreements with the Owner, Cx communication protocols, Cx activities, and the schedule of Cx activities. Success depends on each team member's understanding of what is expected of them and obtaining their buy-in. That is why it is essential that the Owner clearly define, contractually, each team member's role and responsibility in the Cx and in the achievement of the defined objectives and criteria defined by the OPR.

The Owner is head of the project and should be engaged in defining the team's goals and objectives and verifying they are clearly documented in the OPR documents and requirements the CxP uses to implement the Cx for the Owner's benefit.

The Owner should require the update of the OPR as defined objectives and criteria contained in the document are changed as the project progresses.

The Owner should mediate and provide direction to the project team for Cx issues that are identified but cannot be resolved among the team using the established issues resolution process. The Owner should approve, in writing, the resolution directed by the Owner.

03.1 Commissioning Process Provider Request for Qualifications

ASHRAE SSPC 300, Informative Annex 19, "Commissioning Process Request for Qualifications," outlines a recommended process for obtaining and contracting for CxP services.

03.2 Setting Contractual Requirements

Appropriate contract language must be developed for each activity applicable to a specific project or building, such as the following.

03.2.1 Owner's Project Requirements. Assist the Owner by developing the Owner's Project Requirements (OPR) in accordance with ANSI/ASHRAE/IES Standard 202, *Commissioning Process for New Buildings and New Systems*, and applicable Cx technical resources. The commissioning process provider (CxP) should conduct workshops necessary to determine Owner's objectives, criteria, and sustainability goals and provide a written document that clearly expresses the Owner's requirements prior to the start of the design process. The CxP Team should update the OPR as directed by the Owner throughout the Cx.

03.2.2 The Cx Plan. The CxP should develop a Cx Plan that outlines the project's organizational structure and defines the team's roles and responsibilities, deliverables, communication protocol, and schedule of activities.

03.2.3 Basis of Design Documentation. Design professionals should provide Basis of Design (BoD) documentation as part of the design submittals defined in Owner/designer agreements. The BoD documentation should contain the designer's narratives of their intent, assumptions, calculations, and product cut sheets used in development of their design. The BoD should be updated as design decisions are made using track changes to delineate modifications as the design progresses through its phases to completion of the project. Refer to ASHRAE SSPC 300, Informative Annex 06, "Basis of Design."

03.2.4 Cx Specifications. Develop Cx specifications to meet the OPR that clearly define activities during construction and warranty periods for inclusion in the construction documents project manual. Cx

specifications should include contractor scope of commissioning work, construction checklists, testing, training, and Systems Manual deliverables.

03.2.5 Cx Design Review

- a. Designers should participate in the Cx in accordance with their professional services agreement requirements and in accordance with the Cx Plan, which includes design review and issue resolution; updating the BoD; inclusion of Cx specifications in project manual; reviewing and considering comments from the CxP Team; keeping the CxP informed of supplemental instructions, RFI responses, approved submittals for commissioned systems and assemblies, and modifications directed by the Design Team.
- b. The CxP should perform focused reviews for the purpose of verifying that the design drawings and specifications meet the OPR at completion of schematic design, 100% design development, and 95% construction documents or other progressive design submittal schedule established by the Owner. CxP should perform a back-check of all design issues discovered against 100% construction document completion prior to bid date. Maintain a record of all issues and recommendations, including the status and outcome of each.

03.2.6 Construction Submittals Review. The designer should require by specification that the contractor provide construction submittals to the CxP and designers concurrently. The CxP should provide review comments to the designer in accordance with the Project Team's agreed-to submittal process prior to designer approval of the submittals with a copy to the Owner. Designers should review and consider comments received before giving approval of the submittals and should notify the CxP of their selected action. The CxP should review contractor submittals for the systems and assemblies being commissioned for compliance with the OPR.

03.2.7 Observation and Testing

- a. The CxP should maintain and distribute a master issues and resolution log that documents issues discovered through the Cx, recommendations for correction, and the outcomes of each issue. Include issues identified through observations and testing that do not meet the OPR. The CxP should define in the OPR the number of evaluations/tests to be performed, any sampling strategy that will be implemented, if any, for commissioned systems and assemblies.
- b. The CxP should develop specific acceptance evaluation/testing procedures for commissioned systems and assemblies for review and approval by the designers that are included in the project specifications. During construction, contractors should review acceptance evaluation/testing procedures and provide input for designer and CxP consideration and adjustment as appropriate. The CxP should coordinate, witness, and document evaluations of installed work and, where applicable, coordinate, direct, witness, and document performance tests conducted by the installing contractors. The CxP should define sampling procedures of commissioned systems, if sampling is used, and the number of evaluations/performance tests included in the CxP scope. The CxP should coordinate and retest as necessary until satisfactory performance is achieved. The acceptance testing should verify the achievement of the design intent and the OPR, i.e., equipment testing should include operating the system and components through each of the written sequences of operation and other significant modes and sequences, including startup, shutdown, unoccupied mode, manual mode, staging, miscellaneous alarms, power failure, security alarm when impacted, and interlocks with other systems or equipment. System sensors and actuators calibration should be checked during testing by the installing contractors and spot-checked by the Cx Team.

03.2.8 Field Report. The CxP should document issues in field reports for each site visit performed by the CxP Team. Field reports should contain a summary of the issue, photographic documentation if practical, locations where the issue was observed, and description conveying the extent of the issue. Each issue should be listed separately in the issues and resolution log.

03.2.9 Issues and Resolution Log. The CxP should maintain an issues and resolution log that summarizes the issues and the disposition of each issue until resolved. It is recommended that the log contain column for designer, general contractor/construction manager responses to issues identified, a CxP column for responses/comments, and date of resolution.

03.2.10 Systems Manual

- a. The CxP Team should include in the Cx specifications contractor deliverables defined in the OPR to become a part of the Systems Manual assembled by the CxP Team. The specifications should define the format and information to be included in the submittal.
- b. The designer should provide BoD information in CxP-defined format for inclusion in a Systems Manual.
- c. Refer to ASHRAE Guideline 1.4, *Preparing Systems Manuals for Facilities*, for guidance covering both electronic and written documentation and defining location of Systems Manual information.

03.2.11 Training

- a. The CxP Team should include in the demonstration and training section of the commissioning specifications the training described by the OPR. The demonstration and training specifications should specifically define training to be provided, hours per topic, level of training, the training approval process, and documentation requirements.
- b. Training documentation includes requirements defined in the OPR and project contract documents that define training deliverables.

03.2.12 Final Cx Report. The CxP should provide a final Cx Report no later than two months prior to the end of the warranty period.

03.2.13 Cx Process Report. The CxP should provide Cx Progress Reports at the end of each month (or at intervals designated by the Owner).