(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 11—ISSUES AND RESOLUTION LOG

The issues and resolution log is an ongoing listing of issues and questions on a project that needs to be communicated to the Project Team for resolution or action. These are often shown in table format and supplemented with pictures and drawings where necessary.

The requirements for and format of the issues and resolution log should be included in the Owner's Project Requirements (OPR) and supplemented in the Cx Plan. The log should be updated and distributed as often as required based on project progress and installation quality. It can also be supplemented by site visit reports that include routine reporting information that does not require further actions.

The following items may be included in an effective issues and resolution log:

a. Project title
b. Project location
c. Name of the Cx Provider (CxP) managing the issues and resolution log, with e-mail address and phone number
d. Issue number
e. Issue description
f. Pictures of item if available and appropriate
g. Date issue discovered
h. Issue found by name
i. Effects of issue on project or building operation
j. Possible cause of issue or problem
k. Recommendation for resolution if available
l. Person(s) assigned to resolve issue
m. Actions taken
n. Approvals of issue resolution, including approver's name

A distinction should be made between the following types of deliverables, which are all used to clarify construction-related events:

a. **Punchlists:** These are very common lists which are created to ensure that incomplete work is identified and completed. For this type of entry, the path to completion is generally not in question, and no complexities requiring creative input from various stakeholders are required; it is simply work that needs to be finished by a certain deadline. Typical items of this nature are incomplete casework, paint requiring touch-ups, light fixtures requiring new bulbs, etc. There may be multiple punchlists, from the general contractor, subcontractors, Owner, and CxP; it is a good idea to coordinate who will maintain punchlists, and whether there should be a coordinated effort by various parties to use common methods to reduce duplication. Many cloud platforms for project tracking offer the ability to let multiple parties edit the same document simultaneously.

b. **RFIs (Requests for Information):** Unlike punchlist items, the topics of RFIs usually require clarification and indicate that a party cannot proceed until the engineer provides clarification. However, while being potentially more complicated than punchlist items, RFI resolutions are typically still very structured, and result in the engineer of record producing responses to contractors' questions about how to implement the design as shown on the contract documents.

c. **Issues Log:** An issues log is used to address questions for which there may be neither a clear resolution nor a clear party responsible for providing a response. An issue may arise in response to a previously undiscovered site condition, a change in the OPR, a decision by an inspector to reverse permission for a previously permitted design element, etc. An issue is usually a more complex problem than those addressed in either a punchlist or an RFI, although items that appear in a punchlist or an RFI may also surface in an issues log, and often do if their resolution is delayed, and becomes a schedule-critical item that impacts other events.

The CxP maintains an issues log for commissioned systems. The general contractor typically maintains logs for RFIs and punchlist items on all systems (commissioned or not). There may be duplication between these logs, so finding a mechanism which reduces duplication while still allowing easy access to up-to-date information for all stakeholders is desirable. It is up to the Owner, the CxP, and the Project Team in general to decide how the various project elements requiring resolution are tracked, and by whom. All three types of document are commonly employed, and multiple instances of each may also be used.

The Owner should be empowered to maintain an overview of all resolution items that appear in the project; these may be tracked in a Systems Manual, or the electronic project management platform maintained by the architecture/engineering team or the general contractor. The OPR and Cx Plan should include details about the methods selected for the project.

The following "rules of engagement" have also proven to be useful in issues log maintenance, in particular where multiple stakeholders can edit the issues log, as is often the case.

a. **Tagging (or using consistent search terms)**
   1. The larger the project, the more systematic the organization of issues log items should be. A decision could be made up front to identify locations (e.g., with grid coordinates, by room name, etc.) or by CSI division, or other identifiers.
   2. These tags need to be agreed upon before project issues are tracked; it is too late to reorganize the log structure once tens or hundreds of issues present themselves and are being tracked.
   3. It is important that issues can easily be found by various stakeholders, so that resolutions can be tracked consistently. Where an issue is not clearly identified, multiple stakeholders may open a parallel issue with a different name for the same problem, leading to parallel but disconnected threads of information.
   4. Agreements should be made about who enters information into the log, how they do this, and how existing issues are identified and found to ensure that new information related to the issue is located in the correct place. See also the description above on multiple logs kept by multiple companies for the same project; where this is the case, a mechanism should be set up to periodically compare lists (either manually or digitally) and to ensure the resolution statuses are synchronized.
   5. Most likely, almost all of the tracking methods described here will be computerized. From the simple "CTRL-F" for finding text, to hashtags, to advanced queries in databases, methods exist to find information in one or more issues logs. The team should discuss how complex searches are likely to become, compare available tracking methods, and then agree to implement a suitable method. Team members who do not follow agreed upon conventions for entering issues will likely make it impossible for others to conclusively report to the owner on the status of issues and the ability to bring the project to substantial completion, and ultimately to Owner acceptance; as such, maintaining discipline in this area is a key component of successful systems commissioning.

b. **Prioritization**
   1. Toward the end of the project, meetings often revolve around the issues log, because it becomes the source of action items when most other activities are completed.
   2. Meetings are typically of limited duration, such as a weekly meeting lasting an hour. However, depending on project size, there may well be more than an hour's worth of issues to discuss, for weeks or months.
   3. A mechanism for prioritizing issues should exist in the issues log, to ensure that the most important issues are discussed with the relevant stakeholders at a meeting. For example, if the CxP knows that a manufacturer's representative (e.g., chiller start-up technician) will be in attendance at a particular meeting and will be unavailable thereafter, the CxP should be able to filter for the issues relevant to that representative and prioritize them in the meeting agenda.
   4. Priorities will continually change as issues appear and are resolved. Priorities may also change depending on

who attends a meeting; if a person who is expected to attend does not join a meeting, priorities may shift on short notice.

5. Selecting a computerized mechanism that allows the CxP leading the meeting to change priorities and reorder the effective meeting agenda quickly and easily is vital to maintaining productivity on large projects.

c. **Assignment of Responsibilities**

1. Noting that an issue requires resolution is unlikely to produce progress unless a specific party is identified to undertake the specific action. The issues log mechanism should be capable of showing, on a continual basis, who is currently tasked with an action, the specified completion time for the action, and what follow-up is required.

2. Many issues take weeks or months to resolve, and in the course of resolution, have multiple independent stakeholders assigned to complete various independent activities. Person A may have to install something that Person B then has to inspect, followed by Person C, who removes something else. Issue log mechanisms with a single entry per issue, with a single spreadsheet cell showing "response," are generally unsuitable for all but the simplest projects.

3. Larger or more complex projects typically require issues logs that allow for a narrative-based tracking of issues that can extend over time and allow for periodic and automatic notification of stakeholders to whom actions have been assigned.

4. It is worth noting that the CxP who typically maintains the issues long may not be authorized to decide who has responsibility for taking action on a particular issue. In such cases, the Owner or general contractor may have to be a regular co-author of the issues log to assign responsibility for resolving an issue, particularly in cases where issue resolution may entail significant cost. This mechanism should also be clarified in the OPR and Cx Plan.

d. **Level of Responsibilities**

1. A good issues log remains readable and manageable, even as the number and length of issues increases.

2. It is not uncommon for project spreadsheets to begin spontaneously; such a solution often sees the number of columns grow as the resolution of an issue becomes more complex. This in turn leads to difficult-to-read printouts handed out at the beginning of meetings. Such a method is unsuitable on all but the simplest projects.

3. The CxP largely controls the amount of information shown in an issues log; if there is too much information, the stakeholders may fail to "see the forest for the trees." If there is not enough information, someone to whom a task is assigned may be unclear about what is expected of them, or the reason for the task. A good balance between too much and too little information is therefore also key to making the issues log an effective tool, and this often requires some experience from the CxP.

4. Many computerized tools allow the attachment of pictures, reports, etc. to an issue entry, and allow for cross-referencing between issues and various project documents. Such tools should be considered to allow the main body of the issues log to remain limited in size, while enabling those assigned with certain tasks to focus on details and ensure that their actions are efficient and well-coordinated with others.