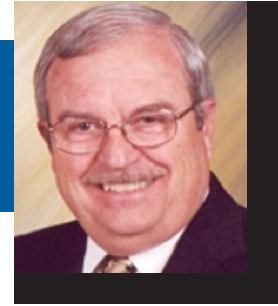


# Commissioning Techniques

*Jim Bochat | Chairman of NEBB's Building Systems  
Commissioning Committee*



## Commissioning Meetings

Commissioning (Cx) meetings are one of the most challenging aspects of the new building commissioning process, not enough meetings and the coordination of the process falters, too many meetings and much time is wasted and the quality of the commissioning process can also falter, so what is the best practice for commissioning meetings?

The basics for commissioning meetings are: (i) that they be managed by the commissioning authority, (ii) that they be scheduled in advance, and (iii) that a meeting agenda be used and distributed in advance of the meeting. Meetings should be short and to the point as required, meetings that linger on wasting everyone's time do not help the commissioning process nor do they help your relationship with the contractors.

I have found that there are some key meetings that help the process while limiting the number of meetings to as few as possible and still have a coordinated commissioning process. These meetings are:

### **A few things not to do in commissioning meetings are:**

- Do not let the owner put you in between the General Contractor (GC) and his schedule
- Do not try to direct the subcontractor's schedules but let the GC do that
- Do not let the GC make you responsible for obtaining subcontractors check sheets

### **Design Kick off Meeting**

At the beginning of the design phase the commissioner should hold a design kick off meeting where he introduces the design team to the design

commissioning plan. The commissioner needs to review what will happen during the commissioning of the design including what a commissioning focused design review is and what it is not. The commissioner needs to make sure he has the correct contact information for the design team and that the lines of communication are clear between the owner, Cx and the design team. The commissioner needs to make sure the design schedule is clear and when his design review and commissioning specifications are required:

Always attempt to use your standard Cx specifications for a project. It is much easier to change your standard specifications to match the project than to change their specification to your process.

### **Construction Kick Off Meeting**

The construction kick off meeting should be held before the Mechanical Electrical and Plumbing (MEP) systems are over 50% installed. This meeting is where the commissioner reviews the commissioning plan with the contractors and explains their responsibilities for the commissioning process. The most important aspect of the Construction Kick Off meeting is to establish the lines of communication, how the commissioner communicates with the team and who is responsible for communicating back to the commissioner from the team. Normally it is the GC Project Manager who is charged with the responsibility for commissioning communications but it could also be the owner's representative. As a part of the project communication you need to obtain the contact information of each the contractor, subcontractors and key vendors who will be involved in the commissioning process. Other important items to establish during the kick off meeting is the construction schedule and how commissioning

activities will be scheduled. It is also important to establish the schedule for future commissioning meetings:

### Sequence of Controls Workshop

After the kick off meeting is held the next critical meeting is the sequence control workshop which is held after the control contractors submittal has been submitted for approval. The people who must be a part of this meeting are the control contractors engineer, the owners lead control operator, the commissioner and the engineer of record, others may attend such as the GC, Mechanical contractor or other team members but they are not critical to the success of this meeting. This meeting is to fully vet the control sequences. The reason this is necessary is because the control contractor will copy and paste the engineer's sequence of controls onto his submittal instead of writing exactly what sequence he is going to program into the controllers. He does this to make sure his submittal is not rejected due to sequence of operation issues. The reason we need exact sequences is that the Engineer writes an English language sequence that describes what he wants the system to do, the control contractor's sequence is written in much more technical language that explains what he has to do to get his system to perform the engineer sequence. The commissioner cannot effectively create functional tests without knowing what the technical sequence will be for the controllers. This meeting is also an excellent opportunity to make sure the owner fully agrees with the sequence of controls, many times the engineer has not asked the owner what sequences he prefers. Once the meeting is done the commissioner documents the changes that were agreed to in the meeting. The control contractor is then expected to "As Built" his sequences to match the meeting agreements.

#### Sequence of Control Workshop Do's

- Whenever possible try to use standard sequences from the control manufacture (Fully Tested)
- Include standard alarms and reports
- Include type of control, PID, Trend and Respond, etc.
- Change Engineers complex sequences into the simplest sequences possible

### Contractor Check Sheet Workshops

If the project subcontractors or their project managers have never been through a commissioning project using your system, a check sheet workshop may be an easy way to train them on the use of contractor completed check sheets. This workshop is used to review how each installation and startup check sheet is used, and what the process is for the completed check sheets being approved and forwarded back to the commissioner. Remember the purpose of these check sheets is to document the work is complete, and to document that the contractor states he has installed it correctly to plans and specification. This will be the only place where you will have documentation of the contractor's statement that he is done. It is also important that the contractor record actual data on the check sheets for future reference by the owner. Make sure the GC understands that it is his responsibility to manage his subcontractors to complete the installation check sheets prior to start up and the startup check sheets prior to commissioning testing of the systems.

### Scheduled Commissioning Meetings

Most projects will require a normally scheduled commissioning meeting which can be problematic if the owner assumes that there will be a weekly or monthly meeting. The problem is that early in the project you do not need to meet very often, but later on, during start up and Cx testing, you will need to meet more often. I would recommend establishing a commissioning meeting schedule that schedules the meetings in accordance with your requirements and your estimate of costs. If the owner or GC wants to piggyback the meeting onto an owners meeting or subcontractor meeting that is OK, as long as it is established that you will only be in the ones that matches your schedule dates. These meetings are used for the following:

1. Review check sheet progress by craft
2. Review the most recent commissioning field report and issue logs. Obtain commitment for issue log resolutions
3. Review the commissioning schedule
4. Review any project changes that will affect commissioning
5. Answer any commissioning questions

### **Minimum Cx Meetings**

- Monthly during MEP rough in.
- Every Two weeks during MEP start up.
- Weekly during functional testing.
- Change Engineers complex sequences into the simplest sequences possible.

### **Owners Update Meetings**

It is beneficial to have regular meetings with the owner to keep him updated on the commissioning process and any issues you are having with the project. This meeting can be a casual meeting but it is important to keep connected to who hired you, and to make sure they understand you are functioning on their behalf. This may be the only way you have of getting some issue log items resolved.

### **Warranty Cx Meeting**

If your project has warranty commissioning in your scope of work this is normally accomplished by having a warranty meeting or workshop where all warranty issues are discussed, and accumulated onto a warranty issue log by the commissioner. This meeting can also be used for a follow up on the owner's performance verification system, and to validate it is working as intended. The resultant performance verification information should be kept for future use of results of your commissioning efforts.