PFTs: Useful Tool or "A Complete Waste of My Time"?

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Synopsis

The discussion will open with a short presentation on the purpose of the PFT or Construction Checklists, how they can benefit the contractor and provider, how they should be used (the PFT process), and sample documents.

Discussion Points:

Contractor's Opinion – Are CxA-provided PFTs of any use? Are they viewed as just more paperwork? Do they aid in keeping a project on schedule? Is there a better way to format them?

Owner's Opinion – Are PFTs cost affective? Do you see them as a benefit? Are you willing to pay the CxA to more closely monitor their use in the field?

Provider's Opinion – Are you successful in getting real PFTs with meaningful information? Do you find that even though the PFTs are meticulously filled out they are not a good representation of field conditions?

Final questions – Are they worth it? If so, how can the process and documentation be improved?

About the Authors

Gretchen Coleman, P.E., CCP, Branch Manager for Engineering Economics, Inc.'s Roanoke, Virginia office, is a leader in the building commissioning industry. As one of the early pioneers in the field, Gretchen has progressed through the ranks of the industry. Gretchen has extensive hands-on experience commissioning HVAC equipment and the DDC systems that control them, as well as lighting controls systems and mission critical electrical systems, and has been instrumental in standardizing written functional performance test procedures and other reporting documentation. As a commissioning authority, she has managed air/water Test and Balance (TAB) services as part of the commissioning process. Gretchen has spoken on the subject of commissioning at various venues, including the National Conference on Building Commissioning. She is a past Board Member of the Building Commissioning Association and is currently serving as Vice President of the Building Commissioning Certification Board, and as President of the National Capital Chapter. Gretchen was the recipient of the BCA's 2007 President's Award.

Definition

A prefunctional test checklist (AKA Construction Checklist in the ASHRAE vernacular) is a detailed list of Installation, Operational, and Documentation requirements that need to occur or be submitted before a piece of equipment or system can be functionally tested.

Purpose of the PFT

The commissioning prefunctional test checklist has many purposes. It is the responsibility of the contractors to provide operating building systems within the guidelines of the contract. The PFTs are one tool that helps the contractors fulfill that responsibility.

- Indicates that systems are ready for functional testing. Answers the question, "What does 'complete' mean?"
- Reduces the amount of time the CxA spends functionally testing.
- Allows the information reported by the DDC system to be used for testing purposes.
- Delineates for the contractor what is required in the specifications.
- Reduces the chance of contractor backcharges due to systems not being ready when the CxA arrives to conduct functional testing.
- Saves money for everyone!

How Are They Supposed to be Used?

Each subcontractor – mechanical, electrical, test and balance, controls – has a part to play in any HVAC system. One way to use PFTs is to provide a checklist for each subcontractor. The idea is for subcontractors to use the list as they install and start up the piece of equipment to ensure that they have not forgotten a task. Some examples of common issues that the PFTs are designed to eliminate are vibration isolation components in the shipping position instead of the operating position; fans running backwards; overcurrent protection devices in the wrong size; missing gauges; valves stroking the wrong direction or slipping on the actuator rods; setpoints not input, etc. The PFT will help the contractor eliminate issues such as these – which is the contractor's responsibility – instead of relying on the CxA team to develop a punchlist for them.

Controls Contractors typically play a very important role in the commissioning process. Additionally, they are usually the most time-compressed sub. They are often times hired long after construction is underway, and they are very dependant upon the other subcontractors to complete their work.

How Can the PFT Process be Improved?

- Add stronger specification language and include sample PFTs in the specifications.
- Include submission of PFT documentation as a milestone on the CPM schedule.
- Create forms that are easier to use.
- Use forms for each individual piece of equipment instead of each type of equipment.

How can the PFT Documentation be Improved?

It seems to be standard practice to have one PFT form for each piece of equipment.

Suggestions:
One idea is to have 3 "Pre-Functional Test" forms per contractor.

- The first would be an installation checklist with a one-line diagram.
- The second would cover startup information and include submission of manufacturer's startup sheets.
- The third would cover information required before the CxA comes out to start functional testing and would include the following:
  - ✓ O&M Manuals
  - ✓ Control Point to Point and Control Calibration sheets
  - ✓ Preliminary TAB reports
  - ✓ Duct Pressure Tests
  - ✓ Piping Pressure Tests
  - ✓ Acknowledgement that all resources and tools will be available when the CxA reaches the job (the right contractors with the right tools).

Submission of the first would be a signal that start-up activities are ready to commence. Submission of the second and third would signal that functional testing is ready to commence.

Is this an improvement? Would it make life easier for the owner and the contractors? Is it cost effective?