Non-Third Party ("Abbreviated") Commissioning: Managing Conflict of Interest

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Synopsis

"Abbreviated" commissioning presents contractual and organizational challenges for the building ownership team when they choose not to hire an independent third-party Commissioning Provider. However, this process may provide substantial benefits over the traditional third party model for small and medium-sized buildings that do not contain complex engineered systems.

About the Author

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Introduction

After more than 20 years of commissioning buildings in the United States, many in the industry disagree on the fundamental issue of who can properly provide commissioning services. The Non-Third Party debate centers on whether or not a conflict of interest exists for Non-Third Party commissioning providers who are members of the design, construction, or ownership team. Some argue that an inherent and insurmountable conflict of interest exists when any member of a new construction project takes on the responsibility of ensuring that the building is operating per the owner's project requirements and the project's design intent. Others argue that, since design professionals and contractors each have codes of conduct and are experts in their field of work, they need not be excluded from playing a large role in the commissioning process as long as the commissioning process is structured to reflect various contractual relationships and manage potential conflicts of interest.

One of the underlying causes of this debate may reside in the application of a single definition of commissioning to the entire new construction industry. The National Institute of Building Sciences, in conjunction with ASHRAE and other professional organizations, are working on a holistic suite of documents that describe the Total Building Commissioning Process. This process involves detailed accounting of the owner's project requirements and independent testing for each part of the building from the roofing to the sewage sump pumps.

A non-third party team composed of members from the design, construction, and ownership organizations can successfully commission buildings less than 100,000 square feet that do not contain highly mechanized systems by employing a commissioning model that is less holistic than the Total Building Commissioning Process. Only the more complex mechanical and electrical systems are commissioned in these buildings. Suitable building projects would not often have complicated systems such as automated window switches or zone-level direct digital controls. However, they would have systems such as electrical dimming in the conference room, an emergency generator with an automatic transfer switch, or thermostatically controlled packaged rooftop air conditioning units.

Buildings that are too complicated for non-third party commissioning are ones with multiple complicated systems that involve a host of subcontractors interacting closely with one another. An example of a control system that that would be inappropriate for this commissioning model is a multi-story office building with central lighting controls that are installed by the electrical contractor but are operated by equipment that is installed and programmed by the HVAC control sub-contractor. Also, lighting systems with two different sources of electrical power such as a turnkey photovoltaic system and utility power might be too complicated. In the same manner, a building with many types of occupancies such as kitchen, office, computer room, and commercial or industrial process areas might not be suitable for a non-third party commissioning model.

The "Abbreviated" Commissioning Process

One Non-Third Party commissioning model developed by Pacific Gas and Electric Company is called "Abbreviated" Commissioning. The "Abbreviated" commissioning process applies to

small and medium-sized buildings (less than 100,000 square feet) without centralized control schemes or highly integrated mechanical and electrical systems. Within these building projects, the more complex mechanical and electrical systems are commissioned. These systems may include:

- Thermostatically-controlled packaged or split-system HVAC equipment
- General occupancy exhaust fans and stand-alone HVAC equipment
- Constant- or variable-volume terminal units and HVAC interlocks with room lighting
- Stand-alone lighting controls such as occupancy sensors, photocell controls, and timers
- Domestic hot water re-circulation loops and heaters

"Abbreviated" commissioning combines key checks and test procedures into a single set of on-site testing procedures performed by a qualified Commissioning Provider (CP) who may be part of the contractor or ownership organization. The process includes the following components:

- Commissioning Plan: A narrative document developed by the Commissioning Provider that describes the steps that need to be completed during design, construction, and closeout phases of the building. Portions of this document may eventually become specification language for the contractor.
- Design Intent document: This document must provide the CP with acceptance criteria to be met during functional testing. The document does not have to be a report nor must it contain long, detailed narratives (see Figure A, below). The CP may be able to gather the design intent information using construction documents but ideally coordinates with the owner and design professionals to clarify the design intent.
- Specification Language: In addition to one or more Division 1 sections devoted solely to the commissioning process and testing requirements, specification writers integrate commissioning fully with several Division 1 sections including Scheduling, Project Meetings, Submittals, Quality Control, Contract Closeout, and Maintenance Materials.
- Functional Tests: The CP develops functional tests for the systems included in the commissioning process that focus on verifying that system sensors are calibrated, that the commissioned systems are operating in a stable and correct fashion, and that the Design Intent acceptance criteria are met. The functional tests may be included in the construction documents.
- Operator Training: At the option of the owner, the CP will coordinate and may perform operator orientation and training. The training agenda and handout materials should reference the day-to-day activities, equipment warranty & contact information, and a description of the owner's requirements for the system operation and performance.
- Systems Manual: In lieu of a final report, the CP provides a brief systems manual. The manual is a practical day-to-day reference guide and will be a stand-alone document that can be provided to the maintenance contractor or building operating staff. It includes: Design Intent document (final version), list of contact information for installing contractors and manufacturers, description of equipment included in the building that must be maintained, list of routine and seasonal operations and maintenance procedures,

copy of the most recent maintenance contract, and a copy of the training materials and agenda (if training is included in commissioning).

Category	Power/Lighting System INTENT (owner goals).	Power/Lighting System Design.	Lighting Controls	Describe equipment sequence of operations.	Lighting Power Density (W/sf)	Interlocks. List interlocked equipment and how interlock functions (Switch turns on EF). Describe each interlocks in each building area.
	SCHEMATIC DESIGN	**DESIGN DEVELOPMENT**	**DESIGN DEVELOPMENT**	**95% CONSTRUCTION DOCUMENTS**	**50% CONSTRUCTION DOCUMENTS**	**50% CONSTRUCTION DOCUMENTS**
Entire Project	Exceed Title 24 by XX% Daylighting (light shelves, etc.):_____ Note exceptions below. Maintain light levels when occupied. Lighting enabled at all times (including loss of utility grid electricity)	XXX Volts, X phase, X W, XXXX Amp service. Code/design basis (e.g. UBC, IES, etc.) for Electrical Systems: _____ Describe emergency lighting system:_____ _____	T-24 lighting shut-off requirements are met by: ____Occupancy sensors ____Time clock	Building shut-off schedules _____Occupancy sensor delay time (note exceptions below. Otherwise, leave cells blank) _____Time clock schedule	Average building LPD=XX W/sf	N/A
Restrooms & Lockers	Light Levels: XX fc	General lighting equipment (T8 w/ electronic ballast, HID, etc.):_____	____Occupancy sensors ____daylight control ____time clock ____toggle switch ____3-way switch _____other	_____Occupancy sensor delay time _____Time clock schedule	XX W/sf	*EXAMPLE: First floor exhaust fan (Room #XXX) turns on with the light switch (occupancy sensor).*

Figure A: A template Design Intent document for electrical power systems that prompts CP for information in a spreadsheet format rather than the traditional narrative format.

The Commissioning Provider (CP) should be a qualified individual with knowledge of the common installation, maintenance, and operational pitfalls for the commissioned systems. A qualified CP has experience troubleshooting the commissioned systems and prior commissioning experience for at least two (2) other commissioning projects of a similar nature. Contractually, the CP should be able to provide an objective and unbiased point of view. A Non-Third Party CP should not hold other responsibilities related to the project.

Non-Third Party Commissioning Teams

The buildings that are best suited for the non-third party model are built under a variety of contractual relationships including:

- Traditional Design-Bid-Build
- Design-Build
- Construction Manager

Each of these relationships has fundamental impacts on the way that a commissioning process must be developed. The primary difference between a traditional independent commissioning model and a non-third party process is to avoid a situation in which a conflict of interest arises. A conflict of interest would exist if a member of the commissioning team held ultimate responsibility for reporting commissioning deficiencies for equipment or systems and was also ultimately responsible for designing or installing that system. Further, a conflict of interest would exist if the Commissioning Provider is under contract with a firm who is has ultimate authority and responsibility for design and/or installation of a commissioned system. Such a

conflict would compromise the commissioning process and jeopardize the successful completion of the project's design intent.

Before developing a commissioning process, the possible conflicts of interest inherent in different types of contractual arrangements should be understood. Without a third-party commissioning provider, some "in-house" member of the ownership, design, or construction team must develop the project's commissioning process and write the Commissioning Plan. This development will depend on how the owner chooses to structure the project's team and what type of contractual arrangements they make with the team. In the same way, there are several other questions that depend on the project's contractual arrangements. These other questions include:

- When must commissioning begin?
- What are the ways that conflicts of interest arise?
- How should an owner manage these conflicts of interest?

To understand the three types of contractual relationships listed below, each of these questions will be addressed.

Non-Third Party Contractual Arrangements

Traditional Design-Bid-Build

In a traditionally-contracted building project, the owner must either include commissioning provider services in the design professional's scope of work or perform this service within their own organization. If the owner does have the foresight to request commissioning with the design team's proposal, either the architect or the mechanical engineer will most likely spearhead the commissioning effort during design and continue most of the Commissioning Provider (CP) services through construction.

Ideally, the person who begins the commissioning process during design will be available to assist the contractors during construction. One recent municipal public works building requested a commissioning plan and specification language from one party but intends to use a different group to act at the CP for the rest of the process. If responsibility for the commissioning process must be transferred from one CP to another, a good way to accomplish this is with a face-to-face "scoping" meeting. However, additional meetings and support may be required after the scooping meeting to make sure the new CP understands their responsibilities.

Commissioning Milestones

To avoid delaying the completion of the construction documents, the abbreviated commissioning process must begin in parallel with the design team preparing the 50% construction documents. The Design Intent document, the Commissioning Plan, and the construction specifications must be prepared prior to the completion of construction documents and bidding.

In a design-bid-build project, it is very important that the construction specification language clearly define the contractor's responsibilities to complete commissioning. Since the specification language will be the contract between the owner and the construction team, the owner and the CP must ensure that the contractor understands the commissioning process prior to awarding a bid. One way to provide more clarification is to have the CP attend a bidding meeting where they can point out the commissioning requirements and explain how commissioning activities will integrate with the traditional construction process.

Potential Conflicts of Interest

Traditional design and construction projects require a high level of coordination and integration between the architect, the project engineers, and other specialty consultants. The architect is often responsible for this coordination. If a member of the architectural firm is also serving as the Commissioning Provider, the CP may overlook or hesitate to point out coordination deficiencies with the design. Likewise, if the design engineer acts as the Commissioning Provider, a similar conflict of interest is possible. In this case, the engineer may miss design errors or may be too embarrassed to point out mistakes.

Managing Conflicts of Interest

To manage these conflicts of interest, the ultimate authority and responsibility for the commissioned systems must be split between two parties. In the traditional construction model, this contractual split naturally occurs between the design team and the construction team. As such, the traditional request for information (RFI) process is adequate to overcome these conflicts of interest. It is in the contractor's best interest to identify and resolve coordination and engineering design issues early in construction. If these issues go unresolved, they may result in "punch list" issues, construction delays, or even "call-backs" after building occupancy. These activities all add cost to the construction process thereby reducing the contractor's profit.

The traditional design-bid-build commissioning process can be structured so that the CP from either the architect or the engineer's firm is keeping installation deficiencies in check. If the CP visits the site at key construction milestones with the goal of forestalling construction defects, the commissioning process has a better chance of resulting in well-functioning systems, a smaller "punch list", faster closeout, and a happier building owner. The Non-Third Party abbreviated model emphasizes the coordination, RFI, and acceptance testing portions of a traditional construction project and requires that the CP focus their attention on these activities in order to achieve the design intent acceptance criteria.

Design-Build Contracting

Design-build contractors are able to provide cost effective buildings by reducing time delays and paperwork that are a part of the building process when separate organizations design and construct the project. However, since they have the authority and responsibility to deliver a complete building to the owner, they are not well suited to be an objective commissioning

provider for the project. Because a conflict of interest might occur if the design build contractor or any of their subcontractors conceived the commissioning process, the owner's company must provide these services.

This situation applies equally well to any project that has a major design-build component. For example, one recent headquarters building had traditional design-bid-build contracts for the majority of the building but a design-build contractor provided the mechanical systems. In this situation, the design engineer was not well positioned to provide objective commissioning services nor was the installation crew able to objectively scrutinize the drawings and engage in a traditional RFI process. Due to the complexity of this project, the owner chose to hire an independent third party commissioning provider.

Commissioning Milestones

Ideally, commissioning should be included in the design-build contractor's scope from the beginning of the project. Prior to hiring the contractor, a CP designated by the owner should be familiar enough with the commissioning process to direct the development of a Commissioning Plan and include contractor requirements in the design-build contract. These requirements should include major commissioning milestones as well as a requirement to work with and report to the owner's CP regarding commissioning progress.

The complexity of the building project will determine whether or not the design professionals will play a major role in commissioning. For most buildings, the design professionals' role will be limited to providing engineering design assumptions and acceptance criteria for key building systems and ensuring that specification language provided by the owner is integrated with Division 1 and other relevant divisions of the construction documents.

At the very least, the commissioning plan must be added to the design-build contractor's scope prior to the beginning of sitework. Although adding project scope after agreements have been made is not ideal, the abbreviated commissioning model may be initiated up until this stage of the process. If the project proceeds beyond this point, the level of effort needed to develop the commissioning plan, Design Intent document, and construction specifications in time to submit and purchase equipment may become a burden on the project schedule.

Potential Conflicts of Interest

The reduced paperwork and cost efficiencies enjoyed by design-build contractors is also a potential conflict of interest. If the design engineer for the design-build contractor is asked to functionally test their work, they may be less likely to require the construction team to correct installation deficiencies since the engineer's company would make more profit if the construction team finishes the job quickly. The design engineer is also less likely to recognize design deficiencies and, if he or she recognized a deficiency, might be too embarrassed to ask the builder to correct it.

In the same manner, asking a design-build construction team to oversee the commissioning process is a potential conflict of interest. Since the contractor is focused on on-time delivery of

the project, they may perceive that a change to the acceptance criteria or the functional testing might streamline construction, thereby obtaining substantial completion earlier and resulting in greater profit for the company. This conflict of interest might lead the design-build contractor to not report or correct deficiencies that might delay construction.

Managing Conflicts of Interest

To avoid these conflicts of interest, a member of the ownership team should direct the commissioning process as the Commissioning Provider (CP). In addition to developing the Commissioning Plan, the CP should prepare and direct the functional testing, review the systems manual, and accept the commissioned systems as a condition of the substantial completion.

At the beginning of construction, the CP should meet with the design-build contractor and sub-contractors to outline the commissioning process. Ideally, the sub-contractors should work directly with the CP throughout construction to verify equipment installation and system functional performance.

Construction Manager

A construction management firm is well positioned from a contractual standpoint to oversee the commissioning process. As long as the owner includes the commissioning process as part of the contract, a qualified member of the construction management organization can be designated as the Commissioning Provider.

Because the construction manager assigns responsibility for completing the building's design to the architect and for delivering a functional building to the general contractor, the construction manager can act as the CP without a conflict of interest. Ideally, the member of the ownership team who works with the construction management firm will also understand the commissioning process and be available to provide a second layer of verification that commissioning is proceeding according to the Commissioning Plan.

Commissioning Milestones

To be successful, the project's Commissioning Plan should be drafted prior to hiring design professionals or contractors. The Commissioning Plan should have enough detail that the CP can include commissioning activities in the contracts for the design professionals and the contractor. Ideally, the Commissioning Plan is finalized along with the agreements for the building's design and construction so the CP can track commissioning in parallel with the rest of the project.

Potential Conflicts of Interest

A conflict of interest may arise if the construction manager is directly responsible for the design or performance of the commissioned systems. A Construction Manager at Risk contract is an

example of an arrangement where the construction management firm accepts the responsibility for delivering the completed building. If an construction manager "at-risk" was also asked to act as the CP, they might be tempted to not report design or installation deficiencies in order to increase their company's profit or meet scheduling deadlines.

Managing Conflicts of Interest

To avoid the Construction Manager at Risk conflict of interest, a member of the owner's organization should act as the Commissioning Provider. In this scenario, the construction management firm might be asked to assist in some of the day-to-day commissioning coordination tasks. However, the owner's CP should retain the responsibility to:

- Approve the commissioning plan and design intent
- Define specification requirements and verify they are included in construction documents
- Develop and direct functional testing
- Review and approve the systems manual

Depending on the complexity of the building, the sub-contractors might work directly with the CP. Alternately, the CP could structure the process such that the construction manager submits documents from various parties to the owner for review and approval. If desired, the construction manager might even attend functional testing along with the Commissioning Provider and the relevant sub-contractors.

Begin Commissioning Early

The common thread in all three of the commissioning contractual relationships is the need for the owner to identify commissioning as a requirement early in the project. Without an independent commissioning provider to lend extra support and focus to the commissioning process, it is essential that the owner fully support the idea of commissioning. If the commissioning process is started after the building is under design, the owner should expect their contractors and design professionals to request extra fees to integrate commissioning into the project. If the owner initiates the commissioning process after 50% construction documents are completed and/or after sitework begins in a design-build project, then the commissioning team will have "catch up" work to do that may result in a higher initial level of effort or scheduling delays.

Conclusion

As the commissioning industry continues to train owners and design teams in commissioning basics, the "abbreviated" commissioning model can be used by Non-Third Party teams to commission less complex buildings. Increased experience with commissioning, better information dissemination via the Internet, and growing sophistication in the market place mean that in-house commissioning will become more prevalent over time.

The challenge facing the commissioning industry is to transform the construction market prior to or in parallel with market drivers such as municipal and statewide energy efficiency requirements and the LEED Green Building Rating System™. The construction market must be educated to maintain well-structured commissioning processes that, at minimum, meet design intent acceptance criteria and avoid conflicts of interest. The market must also learn to balance the first-cost savings and convenience of Non-Third Party commissioning against the benefits and life cycle cost savings of independent review.