

## Commissioning “Lite” An Affordable Commissioning Service

Commissioning appears to be traditionally classified as a *desired*, in lieu of a *required*, professional scope of services. A project’s deterrent to this service has been the perception of commissioning as a cost prohibitive scope. However, we believe that a proper understanding of the commissioning process will demonstrate that the **total project** cost will be either cost neutral or marginally above the estimated project budget.

To achieve a proper understanding of the commissioning process, we would like to introduce “*Commissioning Lite*.” It is our position that a building system’s lifecycle project costs will be reduced commensurately with the incorporation of “*Commissioning Lite*.” Utilization of this service will provide the following system advantages:

1. Introduction of Commissioning Agent (**CxA**) to the design early
2. Quality Assurance begins with the design phase and ends with the activation phase
3. Quality Control is with the contracted professionals
4. Enhanced functional performance
5. Minimal maintenance costs
6. Reduced warranty callbacks

### ***Bridging***

Commissioning cost issues are relative to all projects. The question then is will it be a *required* or merely a *desired* scope of service? The answer lies in the approach. The Owner and design team must not equate this vital scope as a desired service, but rather build it into the basis of the design and integrate it into the construction process to attain the derived benefits.

An Owner’s conscious decision to consider commissioning as a *desired* scope is purely a reactionary concession to the teams’ insistence that scope cutting to relieve cost issues associated with **Traditional Commissioning** services is the only alternative. At this point the Owner willingly relinquishes scope and restructures its program and requires the designers to improve technical specifications and more specifically, performance criteria that will at its best improve the quality of system components. To comply, design teams will be enthralled into a “Value Engineering” and “Scope Reducing” frenzy to reduce project costs enough so that by absorbing traditional commissioning costs they meet the project’s budget.

## **Commissioning**

**Traditional Commissioning** involves a **CxA** contracted through the Owner well into the construction phase of the project. Immediately the **CxA** is plunged into commissioning specifications written by the Architect of Record and discipline specific sub consultants. They are digesting construction documents to develop a project specific pre-functional and functional performance testing program. The **CxA** is always behind on the information curve and will still be pressured to perform. This arrangement does not involve team coordination and cooperation. It is very laborious and expensive. As expected, commissioning is considered a desired service.

The objective of “**Commissioning Lite**” is to derive an integrated building systems commissioning model that will provide similar yet suitable results as a **Traditional Commissioning** service would, but at a streamlined palatable budget expense. How can we redistribute commissioning scope and reduce costs without sacrificing the intent to provide a required service to all projects?

Harris & Associates has witnessed a commissioning disconnect between the design phase and the construction phase. We began to assess the intent of commissioning. It became obvious that responsibilities lapped in many cases and some were duplicated among the commissioning agent, prime sub-contractor and general contractor. Where and how do we separate responsibilities and maintain shared accountability? What are the defined roles? Traditional thought maintains that design responsibility stays with the design team and construction responsibility stays with the contractor. But we espouse that in the vertical building process the **CxA** is a common thread, similar to the Inspector of Record, between the building system’s design and the construction that enforces the specification and compliance with the derived quality plan.

Historically the **CxA** has been added to the project team well into the construction phase. Commissioning specifications are drafted by the architect with input from the engineers. This approach merely provides system component commissioning. The contractors would have completed most if not all the rough-ins. This negates some of the value of hiring a **CxA**, as it would be too late to incorporate their design review input into the design. In a **Traditional Commissioning** approach, the **CxA** is often onsite conducting quality inspections and functional testing. Frequent aggregate testing is extensive and results in increased costs of the commissioning.

Start-up operations for all equipment would be witnessed by the **CxA** including all systems tested that were documented. The challenge to this team was determining how “**Commissioning Lite**” scopes of service could be provided without losing the benefit of the commissioning process. Other questions were asked such as, what would be the relationship and roles played by each team member during the process?

We determined that commissioning experts need to be involved early in the project design phase especially when pre-construction services are scoped into the design

process. This enables the **CxA** performing a third party review of the system's design to offer input to the design team. This input can functionally enhance the system's performance as well as help to improve the field installation process. In addition the **CxA** and prime-sub contractors would develop the commissioning specification and the pre-functional and functional quality program. We believe this approach empowers and solidifies their willingness to accept accountability and ownership.

The **CxA** brings a different viewpoint to the project. Their primary concern is to verify that the Owner's project requirements are incorporated into the project. This includes a focus on the Owner's operations staff's concerns, such as maintainability and proper equipment access, and how the systems function in both near term and in the future. In addition, the **CxA** has a vested interest in making sure the control systems include all required information, and that they function according to the manufacturer's specifications and design intent.

Harris & Associates believes that pre-construction service team members will benefit from the **CxA's** early involvement. The mechanical, electrical, and plumbing contractors will display an enhanced awareness of specific equipment and the system's pre-functional and functional components as they are engaged in the design phase with the engineers and **CxA**. This is believed to be a reminder to the contractors that controls need to be in place to ensure the system's intelligence interface with the equipment thus resulting in greater efficiency, improvement in user confidence, and the reduction in maintenance down time.

Our challenge was to provide a seamless transition especially when the construction team would be different than the pre-construction services team. It was decided that a partnership had to be forged. The bonding bridge between each team member would be through the derivation and implementation of the quality plan. The quality plan includes the following:

1. Early identification of the system's equipment and controls incorporated into the "Basis of Design."
2. Detailed intervals when the **CxA** would perform efficiency and constructability reviews relative to the "Basis of Design," experiences, and project constraints.
3. Strategic milestones involving coordination between designer, prime sub contractor, and **CxA** take place to evaluate system locations, interference potentials, installation techniques, and fabrication.
4. Development and enhancement of field Quality Control and Quality Assurances check lists derived from the manufacturer's pre-function and function requirements and the prime sub-contractor, designer, and **CxA's** experiences.
5. Defined roles and responsibilities
  - a. Provides efficient commissioning services
  - b. Places ownership
  - c. Eliminates duplication of scopes of services
  - d. Eliminates wasted hours and inflated fees

The **CxA**, periodically, will evaluate performance through observation of quality check lists and select equipment pre-functional and functional test procedures performed by the prime sub-contractor. The **CxA** will observe all systems functional testing. The **CxA** is now an observer in lieu of a technician. This also precludes the possibility of someone other than the prime sub-contractor from operating equipment prior to activation and acceptance.

Harris & Associates hopes this narrative has provided insight to “**Commissioning Lite**” as an affordable benefit and not as an intrusive budget issue. This approach mitigates

the Owner’s risk by involving the design team in the commissioning process and linking accountability to the prime sub-contractors. “**Commissioning Lite**” is an approach that reunites the past with the present galvanizing our seamless commissioning theory.

“**Commissioning Lite**” is intended to serve as a template for providing commissioning services for future projects. Please note that this service has been provided to the Mercy Medical Center Replacement Hospital, a Catholic Healthcare West affiliate, at approximately one third the **Traditional Commissioning** services cost.

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