

What Emory University Looks for in a Commissioning Service Provider

Robin F. Smith

Emory University

This paper is about Emory University's quest toward consistently high quality efficient production of new facilities, buildings that could be effectively cared for and would provide an excellent working environment for the users of these facilities. The qualifications of commissioning consultants and the needs of Emory's Facilities Management Department are highlighted.

Robin F. Smith is the Commissioning Manager of Emory University in Atlanta, Georgia. He has over 30 years experience in construction, project and facilities management. He has a Masters in Business from Georgia State University in Atlanta. He has been married to his wife, Marilyn for more than 40 years, with two fine sons and one very special granddaughter. His hobby is making concert violins.

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As a short background, Emory University is a private school located in Atlanta, Georgia, on a campus of approximately 150 major buildings and 740 acres. Emory has had written construction and commissioning standards for about four years. We have a full time staff position in our plant operations area for the support of the commissioning process and we are extremely committed to the practice and improvement of construction commissioning.

The primary purpose of all of Emory University's web-based standards, which include commissioning, is to help us build a better building. In our definition of "better" we address efficiency of energy usage, occupants needs and expectations, maintainability and other issues. We are totally committed to the commissioning process, having almost 800 million dollars now in planning , design or construction – all of which is being commissioned or is budgeted to do so. We look on the commissioning function as a quality assurance process for construction.

We are rather specific in what services we ask our commissioning consultants to provide, fully outlining these requirements in various sections of the standards. We ask and indeed expect these providers to read and comply with these written instructions. Our written standards are updated on regular intervals and are considered a living document.

We have a good start in developing the commissioning program for construction at Emory University but we are well aware we have only started to learn. Knowing this, we purposely spend our commissioning consultant dollars with firms that we feel will teach us something we do not already know or something we need to know more about. The management of commissioning at Emory is housed in Facilities Management Plant Operations. This is by design and reinforces our belief that this department more nearly represents the owner than any other on our campus. This provides us with an internal check and balance for our construction quality effort. This mix of personnel between maintenance and construction is, I believe, unique to Emory University. We think this approach gives the best and most consistent results.

In addition to the usual construction skills, we like a firm with some understanding of maintenance or long term facility care as this aids in addressing our day-to-day operational needs. It is essential that our commissioning consultants are able and willing to become a strong part of the team we assemble to create a new building. We ask our team to produce a Design Intent document that is to become the goal for the entire team. We ask that our operations staff be involved in the commissioning of our new buildings, by strong training in the technical aspects of the building and by actual participation in the functional performance testing, serving as helpers to the commissioning provider and gaining invaluable hands-on training in the process.

We are looking for a better way to do our job and for help in doing it.

Given the above, let us look deeper into commissioning as adapted and modified at Emory University. Our version of commissioning has produced improved teaching and

research facilities that operate more efficiently than before and provide a higher quality work environment for our facility users, faculty, research scientists, students and staff.

Building commissioning at Emory University became an integral part of our planning, design and construction program when the President declared in 1996 that all new construction on campus would be commissioned. Since that time funds for full building commissioning have been allocated and approved as part of the total project budgeting process. At Emory, funding for commissioning is a line item in the capital budget for each new project. Currently there are 53 projects in planning, design or construction valued at approximately \$850 million, all of which are either being commissioned or budgeted for that purpose. In every case commissioning has not or will not be compromised. To date, Emory has completed the commissioning process on five major new buildings, totaling approximately 645,000 square feet.

This adaptation of commissioning and the University's commitment to it, led to Emory's decision to develop complete design standards, assuring the owner's preferences were made a matter of record. A logical progression of this was the publishing of these standards on the World Wide Web (www.emory.edu/FMD/web/emory-std/design.htm) in order to share our work with everyone. The response to this has been most encouraging.

We select professional, state of the art, practitioners to guide our commissioning work here at Emory. We try to modify our professional selection by fitting each new building's challenges to the individual skill sets of the commissioning agent as we understand them. We like to learn something specific from each project and we facilitate that learning by having our frontline building maintenance staff participate in the testing done by each commissioning professional. This practice saves commissioning fees while concurrently providing invaluable hands-on training to our frontline people. Additional training is gained from our regular tours of new construction for all interested parties and helps greatly to familiarize us all with each building and all its systems. Our permanent building mechanic is placed in each building three months prior to its completion to give him/her a better understanding of the structure and greatly improves our ability to provide excellent customer service once the building becomes occupied.

As a natural extension of the quality function that is commissioning, we have progressed into other good construction practices, such as the pursuit of the U.S. Green Building Council's Leadership in Energy and Environmental Design Guidelines (LEED) certification for our new buildings. The activity with the LEED program will become part of our quality effort and a linkage to our commissioning Program. The LEED program is a new quality and environmentally friendly practice that has thus far certified only a handful of buildings in the entire United States. Emory has submitted certification applications for three buildings in various states of construction. The LEED program gives considerable weight for commissioning of buildings in its evaluation process. The activity with the LEED program is a direct result of and a benefit to our commissioning program. Also, we are honored to have been asked to pursue a pilot program for the new LEED branch for existing buildings. Given the close relationship of the LEED

certification and commissioning, cutting edge knowledge of the whole LEED program is an important qualification for the commissioning providers we need and select.

We have developed several tools and resources to implement our version of commissioning. We ask that commissioning providers become familiar with these tools so that they can better follow our preferences and be better able to help us improve the processes. Probably the earliest and biggest resource developed was the creation of our construction standards which incorporate commissioning, all catalogued according to the universally accepted Construction Specification Institute (CSI) outline. All facets of our division, including architectural, engineering, various crafts shops, building services (cleaning), roads, grounds & recycling & waste management, wrote these standards. The format of our commissioning portion of these standards was strongly influenced by the pioneering efforts of the University of Washington and the commissioning guidelines by PECCI for the federal government. Emory researched several major universities to learn from their work in the formulation of our standards. Our standards, complete with commissioning, were a composite of all the information available to us at that time. From this beginning we modified the work as changes were needed.

The second major tool for implementation of our particular commissioning program is our Close-out Checklist. This powerful, adaptable tool was presented to the annual SRAPPA meeting in Roanoke last fall. We freely distribute this checklist and are constantly improving it with the help of users. This tool is the focal point of our building turnover process, which appears to be unique to Emory University. The primary benefit of the checklist is the rather complete listing of the various elements of a construction project of the kind in which most of us are involved. This listing can be used by almost anyone to monitor the separate events on their project. Our commissioning providers play a major part in the completion of this checklist with the O&M manuals, training, etc. This is indeed a work in progress and is in fact meant to be tailored to fit each project to which it is applied.

A recent nationally published article on construction stressed a very important point in the facility building world; “occupancy should not validate completion.” Think carefully about what that says. The article goes on to discuss the almost universal problem of building users moving into a new facility before it is ready, at least before it can be properly maintained or adequately function to produce the environment needed by the occupants. The building is up, it looks done, what is the problem?

Each of the many construction issues leading up to the customer move-in can potentially cause a problem that will compound or prevent a smooth transition to the occupancy of the building. Just because people are in and using a new building does not mean it is finished. In fairness, we should define “finished” as this word means different things to different people. We in plant operations like to think “finished” is when we have all the materials and documentation we need to properly care for the facility. We think we should have training on all the systems. We think the building should work. Often the builder of a new building thinks a building is done when he can obtain a certificate of occupancy and collect his money. Usually the builder’s retainage for punchlist items is

small and his effort toward this finishing of details is not of a level with his prior activities. The most notable difference is the change in urgency of the two efforts. The commissioning provider's oversight of project completion and quality is key to this process.

We have struggled with this problem for a long time, as have most of you, I am sure. We have devoted considerable resources and energies here at Emory in the past four years to address the entire issue of building construction, quality control, and maintenance management issues. We still have difficulties with this, even after the development and implementation of complete construction standards. These regulations included full commissioning, with all the control and discipline that process brings to the table. Our oversight of the multitude of tasks that become construction management -- and most particularly the closeout and move-in of building occupants -- has been strained and difficult.

This quality enhancing process for construction is just beginning to take hold in our field and is moving rather slowly, probably due to the complexity and fragmentation of all entities involved. commissioning a project assures the construction of a facility that meets the needs of the building occupants and verifies functional performance prior to move-in. This verification of performance goes to the heart of the commissioning process. It is accomplished by the writing of specific functional performance tests and the controlled, monitored execution of these tests.

These project specific tests are the very essence of commissioning, and must be written very specifically for components, systems and the interaction of one system to another. Building commissioning is a meticulously detailed process involving a great deal of repetition, much unexciting checking, testing, recording and re-testing. The primary reason commissioning produces better buildings is that this process physically checks and verifies nearly everything. Nothing is left to luck or chance -- it is checked! This is all really simple and straightforward. commissioning is a relatively new process and is a different way of thinking that requires new mixes of people working together

One really good way to start the process of commissioning construction projects is with the use of a document called "Design Intent," or as ASHRAE is starting to call it, "Owner's Project Requirements." Have you ever heard of this document? Have you ever seen one? Most have not. At the very first of the planning process or the programming stage this simple, plain-English document is developed. It is constructed with input from the future occupants, the construction specialists, as well as the people who will care for and clean the structure. All operational issues are spelled out, such as HVAC requirements, loading dock needs, maintenance and custodial storage spaces, etc. These rules become the goal of all the participants in the project. Stated simply -- this document lists the owner/occupant's expectations for the building or project. The Design Intent document is basis for the commissioning of the building. One of the single most important capabilities of a potential commissioning provider to Emory University is experience in developing this design intent document.

Since commissioning is to give the owner what the owner wants, it is necessary for the owner to write down just exactly what the owner does want. It is not sufficient to hope the consultants will be able to remember the specifics of our preferences, although they will try to do so. Designers really do prefer to have well-defined goals and not be forced to hit a moving target. It is understandable that we each have different motivations, but herein lies the challenge -- we must combine our separate interests into one common thread. It is to all our advantage to develop and strengthen this collaborative effort that is the heart of commissioning and will indeed produce a better building. This is a formalized process that brings us together in a planning mode to anticipate and avoid the problems we have seen in the past. Our commissioning consultants must be able and willing to help this happen.

The entire construction process has continued to become more complex in the quest for better and more energy efficient buildings. These buildings are more dependent on computer controls and complicated sequences of operation. As ever-increasing budget pressures vie with ever-increasing budget demands, the whole process gets harder to manage. On the other hand, many of the problems discovered in our new buildings are very simple and basic, such as specified components missing or not even being installed, or units upside down or running backwards. There often seems to be a lack of even rudimentary inspections on many projects -- and if a project starts to go bad, it certainly seems to continue down that path. This all too common situation cries out for the quality control of the commissioning process and the services of a seasoned commissioning provider.

Now, let us look at Emory's standards and see just what we do ask our commissioning providers to do. Let's start with Section 00010, "Facility Management Organization for Design and Construction Management" which explains the necessity of the commissioning provider working with all four parts of facilities management.

Section 00030, "Facilities Programming/Predesign" introduces the Design Intent document and its essential role in the owner's commissioning program. This is, as I have said, one of the most crucial services we ask of our commissioning consultant.

Section 01810, "Commissioning" gives the basic outline and lists the critical participants in Emory's commissioning function, as well as a general introduction to commissioning. It spells out the design team commissioning requirements and the commissioning provider's role. It further stipulates the commissioning provider will be an independent agent not otherwise associated with the A/E team or the contractor, but work directly for Emory University. This section further lists in detail the commissioning provider's various responsibilities.

Section 01830, "Operation and Maintenance" explains the relationship between the plant operations department at Emory University and the commissioning provider for new construction as well as discussion on value engineering and plant operations' role in this.

Section 17100, "Commissioning Requirements." At Emory, we add division 17 to the standard CSI outline. We call this division "commissioning." This section lists all the responsibilities and requirements of the entire commissioning function and duties we assign to the commissioning provider. This section is extensive and complete and serves as the basis of our contractual requirements and relationships with the people we hire to provide commissioning services. This section covers all of the normal commissioning tasks, such as design intent, functional performance testing, staff training, inspections, O&M manuals and project close-out.

In parting, I would like to thank each of you for sharing this time together. We must not squander this opportunity we have to make a difference. That is up to each of us, we have the experience, the drive, and the motivation. Let us just work together and see how good a job we can do. We are looking for help in doing a better job, not just different - but better.