

Commissioning as Evidence in Litigation: Are you ready to take the stand?

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Synopsis

Commissioning of building systems verifies that the systems are installed and operating in accord with the design intent and owners requirements. However, what if commissioning, rather than solving problems, reveals a persistent pattern of poor workmanship, under-design, communication mishaps or misapplied technology? When the potential for litigation looms, the findings of the commissioning authority can represent a key element in the dispute. This article contains no legal advice, but rather provides crucial information regarding methodology and verification of results throughout the commissioning process in the event that Cx agent becomes subject to the rigors of cross examination and legal scrutiny.

About the Authors

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Introduction

Building commissioning ensures that a building's systems are designed, installed, and tested to perform according to the design intent and the building owner's operational needs. Commissioning is a quality-assurance process that guarantees the building systems operate efficiently, meet the needs of the end user, and maintain occupant comfort. Engaging a commissioning authority also includes the promise that the initial costs of commissioning can be recovered through increased operating savings, improved staff performance, and avoidance of costly construction or warranty period problems.

Although the objective of commissioning is to verify that components and systems are installed and operating in accord with the design, sometimes functional testing, rather than solving problems, reveals a persistent pattern of poor workmanship, under-design, communication mishaps or mis-applied technology.

When the potential for litigation looms between owners, architects, engineers and contractors in under-performing building construction projects, the findings of the commissioning agent can represent a key element in the dispute. The commissioner can find himself or herself thrust into the unfamiliar territory of depositions, affidavits, and as an expert challenged by attorneys defending their clients. In such cases, it is imperative to thoroughly document communication, methodology and verification of results throughout the process in the event that the project is in dispute, and the commissioning agent becomes subject to the rigors of cross examination and legal scrutiny.

Projects in Dispute

There are many reasons why a building project can become embroiled in litigation. It is helpful to recognize the signs and be prepared for the legal discovery process.

Litigation, after a building project is complete, is frequently considered if the systems do not perform as expected and the efforts to rectify those problems have been unsuccessful. Some reasons why a building is not performing up to expectations may be design errors, contractor errors, poor workmanship, miscommunication, misapplication of technology, equipment coordination problems, lack of start-up, or controls programming errors.

In a new building project, if a construction or performance deficiency is not rectified, the responsible contractor may have their retainage withheld by the general contractor or owner. Traditionally in the construction industry, retainage has been used by owners as a security device by holding back, or retaining, a certain percentage of progress payments made to contractors. The same device is frequently employed by contractors on progress payments made to subcontractors. The holdback is intended to provide an owner with a bank of funds to be used to finance completion or correction of a defaulting contractor's work. Retainage is usually held until completion of construction of the project and is then released along with the final payment to the contractor.

If the findings of the commissioning authority are wholly or partially responsible for the withholding of contractor retainage, and the project develops into a dispute, the commissioning authority will certainly be asked to substantiate and defend their findings.

Another situation that can result in litigation is when a commissioning authority is asked to retro-commission a building that has significant occupant complaints and or high energy bills. If it is discovered that the building has significant performance deficiencies, the tenant may seek financial compensation for contract default, loss of productivity and higher than expected energy costs. In response, the owner may decide to litigate the case in order to recover damages from the contractor and or engineers.

Finally, when a building is for sale and there is an interested buyer, the buyers agents may require due diligence as part of the process to discover the true value and condition of the property. Due diligence (also known as *due care*) is the "effort made by a prudent or reasonable party to avoid harm to another party." Failure to make this effort may be considered negligence. Quite often a contract will specify that a party is required to provide due diligence. Due diligence is a term used for a number of scenarios involving the performance of a professional inspection with a certain standard of care.

If during the performance of due diligence the commissioning authority discovers significant performance deficiencies, that discovery can impact the sales price of the property - if not the sale itself. Again, the owner may elect to initiate a lawsuit to recover the costs associated with the loss of value in the building, or repairing the deficiency. In that case, the findings of the commissioning authority may come under scrutiny by the opposing attorneys.

What to Expect

If a building project comes under dispute, and you or your commissioning firm is named in the lawsuit, both sides will initiate a discovery process to assemble all the documents pertinent to the case. Each side will schedule depositions to interview individuals whose testimony might aide in the discovery process. A *deposition* is evidence given under oath and recorded for use in court at a later date. A deposition is a part of the discovery process in which litigants obtain information from each other in preparation for trial. Some jurisdictions recognize affidavits as a form of deposition.

At trial, deposition testimony can be used to cast doubt on a witness's testimony or to refresh the memory of a suddenly forgetful witness.

During the deposition, attorneys from either side may potentially interview the commissioning authority with the specific intent to discover:

- What are your qualifications?
- What were your findings?
- How were your measurements made?
- How did you come to your conclusions?

Qualifications

The attorney conducting the deposition will address the question: *Why are you qualified as a commissioning authority?*

Extensive experience with the systems being commissioned either as a designer, (professional engineer or architect), builder or technical service person is desirable, in addition to commissioning experience. Be prepared to document that experience. All experts are required to produce a curriculum vitae. Curriculum vitae is Latin meaning "course of life", and is a professional resume documenting experience, expertise and qualifications.

To date there is no nationally recognized certification for commissioning agents. However several organizations do provide commissioning certification programs and validate the qualifications of commissioning providers. Several are listed below. These certifications are one way to present sufficient qualifications as a commissioning authority, and the elements of these programs may well be used as a standard of performance.

Organization: National Environmental Balancing Bureau (NEBB)
Certification Program: Systems Cx Administrator
Website: www.nebb.org

Organization: The Building Commissioning Association (BCA)
Certification Program: Certified Cx Professional (CxP)
Website: www.bcxa.org

Organization: Association of Energy Engineers (AEE)
Certification Program: Certified Building Cx Professional (CBCP)
Website: www.aeecenter.org

Organization: The Associated Air Balance Council (AABC) Commissioning Group (ACG)
Certification Program: Certified Commissioning Authority (CxA)
Website: www.aabchq.com

Methodology

When the deposing attorney asks: “What methodology did you use to come to your findings?” be sure you are familiar with the commissioning community’s standard of care and professional standards. *Standard of care* is “the degree of prudence and caution required that a reasonable individual would be expected to exercise under such circumstances.”

In other words, what would a professional commissioning authority do to identify the deficiencies in such a system? One resource for documenting accepted procedures in commissioning are the commissioning certification organizations listed in this article. In general, accepted standards of care suggest that the commissioning authority review designs for completeness, review equipment submittals for conformance with design documents and specifications, provide pre-functional test plans, perform construction observations, review start-up documentation noting its adherence to the manufacturers suggestions for service start-up, review controls point-to-point documentation, review test and balance reports, devise functional test plans based on the controls sequence documentation, and execute those test plans. In complicated or critical applications commissioning protocols are more stringent.

Having a carefully constructed commissioning plan and specification that outlines the commissioning methodology along with documentation of the process will go a long way when defending the specifics of your findings.

Measurements

Another question the deposing attorney is likely to ask is, “How did you make your measurements?” If you discovered the system performance to be in some way deficient by measuring temperature, pressure, voltage, amperage, wattage, humidity, air velocity, or infrared thermography, those measurements and the instruments that made them may come under scrutiny.

Three key issues to consider when defending your measurements are calibration, instrument use training and the management of instruments.

1. Calibration

In a deposition it is likely that the accuracy of your instrumentation will be questioned. The easiest way to deflect that inquiry is to have an applied *metrology* protocol in place. Applied metrology, (the science of measurement), refers to the application of measurement science - ensuring the suitability of measurement instruments, their calibration and quality control of measurements.

A core concept in metrology is traceability, defined as "...the property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards." Traceability is most often obtained by calibration,

establishing the relation between the indication of a measuring instrument and the value of a measurement standard.

A well established standard of traceability is having a NIST traceable calibration vendor check your sensors or equipment. NIST, The National Institute of Standards and Technology, is a federal technology agency that develops and promotes measurement, standards, and technology.

Calibration protocols have a cost associated with them. For example: Performing in-house calibration against a known reference (say an ice bath) is cost effective but will not produce a third-party certification of the accuracy of your instruments. A more expensive option is having a NIST traceable calibration vendor check your sensors or equipment against NIST traceable instruments. A NIST traceable calibration vendor will provide a certified NIST traceability document that can be produced in a deposition or trial. Even more rigorous, and expensive, would be having a NIST Accredited Calibration performed by a laboratory with NVLAP accreditation (National Voluntary Laboratory Accreditation Program).

2. Instrument Management Program

Besides the accuracy of your instruments, the deposing attorney may raise the issue of how your instruments are being managed. Is every measurement easily traced back to a specific instrument with a carefully documented history of calibration, service and repair? Has the person operating the instrument received training on the use of the instrument and how to make proper and accurate measurements?

To defend against allegations that your measurements are questionable, have an in-house instrumentation program that consists of an up-to-date database documenting the following:

- Equipment ID's
- Equipment checkout and tracking protocols
- Calibration schedules, dates and certificates
- Operator training certification
- Standard Testing procedures
- Incident reports (equipment that didn't work) and service records

Professional Standards

Finally, the deposing attorney may ask, "How did you come to your conclusions? If you have discovered some deficiency in function, operation or construction, be sure you are familiar with the building and engineering community's standard of care and professional standards. In other words, *what professional standard is relevant to the issue?*

As an example, I was once deposed in a case where the general contractor had installed a vapor barrier in a critical humidified space. The HVAC system couldn't keep up with the real humidification load because the vapor barrier had numerous open seams and unsealed

penetrations. As a commissioning authority, and mechanical engineer, my conclusion was that the vapor barrier was improperly installed. Upon hearing that statement, the attorney interviewing me asked to see the standards of design and installation that governed the application of vapor barriers that I had based my conclusion on. Under cross examination, even the obvious requires the precision found in any engineering discipline.

To give expert testimony, become an expert familiar with the standards of design and installation that govern the application that is the subject of your conclusion. Below is a partial list of the source of standards as they relate to commercial, industrial and institutional building projects:

ASHRAE –An international technical society organized to advance the engineering science of heating, ventilation, air-conditioning and refrigeration. Publishes technical transactions, standards, handbooks and guidelines.

SMACNA – An organization that publishes standards and manuals addressing all facets of the sheet metal and HVAC industry, from duct construction and installation.

NEBB – National Environmental Balancing Bureau (NEBB) is an international certification association for firms that perform testing, adjusting and balancing (TAB) of heating, ventilating and air-conditioning systems in addition to building systems commissioning, sound and vibration measurement, and clean room performance certification. NEBB Procedural Standards provide guidelines for work to be performed.

NFPA–National Fire Protection Association (NFPA), an organization providing scientifically-based consensus codes and standards regarding fire protection, retardant materials, and smoke ventilation.

IBC– International Building Codes (IBC). Develops building code information, standards and resources for residential, commercial and institutional building construction regarding architectural, mechanical, plumbing, electrical, and fuel gas systems.

ANSI – The American National Standards Institute (ANSI) coordinates the development and use of voluntary consensus standards.

ASME – American Society of Mechanical Engineers produces codes and standards for boilers, pressure vessels and piping manufacture and installation.

Documentation

Finally, if a building project does not meet performance expectations after commissioning, the deposing attorney may suggest that the commissioning agent is partially responsible for the failure of the building systems to operate efficiently, meet the needs of the end user, and maintain occupant comfort.

To defend against such allegations, carefully document all agreements that pertain to scope of work, roles, responsibilities and the resolution of deficiencies.

Be sure to document in your commissioning specification(s) the scope of work of the commissioning authority, define the roles and responsibilities of all the participants in the commissioning process, and outline your limits of liability when there is non-compliance by any of the participants in the commissioning process.

For example, was the commissioning authority invited to participate in the design process? If so, document all responses to commissioning reviews, and if positive responses were integrated into the contract documents. Where all of the issues raised during functional testing resolved? If not, what does the specification, or your contract, state about your responsibility when a contractor is non-responsive to the list of issues you raise? What is your liability if a contractor is uncooperative during the process of commissioning?

The commissioning specifications should be referenced in all other specification sections that pertain to the work of the participants in the commissioning process. For example: a mechanical commissioning specification should be referenced in sub-sections regarding facility operations - division 0100, and sub-sections referring to general mechanical instructions, controls, and test and balance - division 15000. This practice insures that all participants in the commissioning process are informed about the process in the contract documents.

Conclusion

Concerns about building performance, employee productivity, indoor air quality, energy consumption and the rise in popularity of the LEED building certification programs are providing increasing opportunities for commissioning providers. With increased opportunity comes the increased risk of being involved in a project that results in a legal dispute. Mitigate your risk by thoroughly documenting your scope, roles and responsibilities, communication, methodology, and verification of results throughout the commissioning process.

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