Energy usage accounts for more than half of a typical hospital’s annual budget, according to the American Society for Health Care Engineering (ASHE). As the health care industry continues to face pressure to cut costs, hospitals are relying on the commissioning process to ensure that operational expenses and procedures are optimal.

ASHE’s Health Facility Commissioning Guidelines defines commissioning as a process intended to assure that all building systems in a facility are installed and perform in accordance with the design intent, that the design intent is consistent with the owner’s project requirements, and that operations and maintenance staff are adequately prepared to operate and maintain the completed facility.

History of Commissioning in Health Care

Because of the cost benefits and energy savings, the commissioning process has become more common in all types of new construction and is now considered crucial in health care facilities, due largely to the strict codes and standards for hospitals. Despite advocacy for commissioning in all hospitals, the process has not always been formalized. In 2010, ASHE published the “Health Facility Commissioning (HFCx) Guidelines.” The publication was the first set of standards that were specific to addressing the challenges of the commissioning process in health care facilities. According to the American Hospital Association (AHA), the guidelines assign accountability for actual building performance to an entire team, including the health facility commissioning authority (HFCxA). For two years, the HFCx guidelines set a new standard for health care commissioning and provided hospitals with the resources to maintain a meaningful commissioning process.

In 2012, ASHE published a follow-up publication to the HFCx Guidelines, the “Health Facility Commissioning Handbook: Optimizing Building System Performance in New and Existing Health Care Facilities.” The follow-up provides program examples and how-to prescriptive instructions for health facility managers on achieving the standards. Most recently, the Facility Guidelines Institute (FGI) published “Guidelines for Design and Construction of Hospitals and Outpatient Facilities.” The 2014 guidelines includes increased requirements for commissioning infrastructure systems.

Existing Building Commissioning

Existing building commissioning (EBCx) usually occurs when a system upgrade is necessary. Existing building commissioning is valuable because it allows for hospitals to identify operational problems that may have occurred during construction. Hospitals that were not commissioned during new construction are likely to perform below their operational potential and use an excess amount of energy and pay higher costs to operate the facility.

According to the U.S. Department of Energy, the EBCx procedures must be performed consecutively, but certain aspects of the process should be repeated periodically to ensure ongoing building performance. Commissioning an existing hospital requires the evaluation of the entire building. All of the hospital’s systems (including interactions among the systems) are required to be tested and proven to be satisfactory. The EBCx process can achieve both short-term and long-lasting results. By documenting exact specifications for the facility’s building envelope, equipment, and processes, EBCx provides a baseline for future commissioning projects and guidance for preventative maintenance strategies.1

The EBCx process takes place in the basic phases listed below.2

- **Planning.** Develop goals, determine facility requirements, and create a commissioning plan
- **Investigation.** Conduct field inspections, collect data, analyze system performance, and identify improvement opportunities
- **Implementation.** Make desired facility improvements and repairs and verify results
- **Turnover.** Conduct a project hand-off meeting between the commissioning team and the operations and maintenance team and hand off final documents, including the final report
- **Persistence.** Develop and apply systems to support continual

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Choosing the Commissioning Provider and Design Phase

For new construction, the commissioning process starts as early as the design and programming phase of the project. If a hospital elects to have commissioning done on new construction, the HFCxA can be selected and become part of the team prior to the completion of the new construction’s design.

A suggested procedure for choosing a HFCxA includes the following steps:

- Establish an experienced selection committee
- Provide a common basis for HFCxA selection (e.g., a request for qualifications)
- Short-list qualified HFCxAs
- Interview qualified HFCxA candidates
- Make the selection
- Negotiate the HFCxA fee and contract

Once the HFCxA is selected, it is crucial that the commissioning process includes design reviews throughout the duration of the project. The HFCxA will then develop commissioning specifications that should be included in the final construction project plans. The specifications should clearly delineate the responsibilities of the commissioning provider, owner, design team, construction manager/general contractor and subcontractors. It is important that the specifications provide clear detail about the process of special systems commissioning.

Going Green

As more and more hospitals participate in the commissioning process, many health care professionals are turning to the “go green” initiative to cut back on a hospital’s energy consumption and reduce its impact on the environment. Many hospitals rely on Leadership in Energy and Environmental Design (LEED), a rating system for buildings developed and promoted by the U.S. Green Building Council (USGBC). A hospital may obtain one of the four levels of the LEED certification; certified, silver, gold and platinum. The rating system judges the design, construction and operation of hospitals that are going green. The “LEED-New Construction (NC) Reference Guide” states that “a commissioned building provides optimized energy efficiency, indoor air quality and occupant comfort” and goes on to say that “conventional commissioning has limited the focus to heating, ventilation and air cooling (HVAC) systems but that coordinating other building sustainable design systems in the commissioning process results in higher performance, sustainable buildings.”

As seen in the chart below, hospitals have improved their overall efficiency since 1999. Total energy use (British thermal unit (BTU)/square foot) declined between 2013 and 2014, but energy costs ($/square foot) are increasing, despite a slight drop during the economic crash in 2008.

More Efficiency, More Savings

With the commissioning process, persistence is key. Undertaking such efforts involves a process of tests, analyses, and follow-ups but the savings can exceed the initial investment. The process allows building systems to operate and perform efficiently and effectively which, in return, reduces capital expenditure costs. Further, as new guidelines are published, hospital standards and codes will continue to evolve. Whether it’s for new construction or existing hospitals, the commissioning process allows health care organizations to achieve efficient facilities that provide significant value to staff and patients.

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