



Building Diagnostics  
& Property Science



www.bldgdiagnostics.com

## BUILDING COMMISSIONING

Many new buildings perform poorly during their first years of occupancy. Problematic buildings are typically those with complex HVAC systems and/or convoluted building envelopes and located in rainy and hot/humid climates. **Performance problems include excessive energy use, occupant comfort problems, and even degraded indoor air quality.** Building system failures can result in moisture intrusion problems that require very expensive repairs and litigation.

### HOW COST EFFECTIVE IS IT?

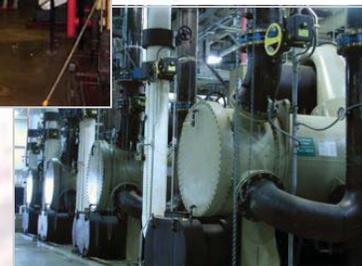
The benefits of commissioning sound like a building owner's dream come true: fewer change orders during construction; fewer call-backs after construction; lower energy bills; avoided premature equipment replacement costs; proper training of the building's operational staff; safer and healthier indoor environment; long-term tenant satisfaction and improved profit margin.

Although it is becoming increasingly common, many building owners still don't fully understand what commissioning involves, or are skeptical of the cost-effectiveness claims made by energy-management and commissioning professionals.

An important new study by Lawrence Berkeley National Laboratory (LBNL), funded by the U.S. Department of Energy, may go a long way toward changing the minds of decision makers who are sitting on the fence when it comes to commissioning. **In fact, the study concluded that commissioning is one of the most cost-effective means of improving energy efficiency in commercial buildings.**

### WHAT DOES IT REALLY COST?

The researchers found that for new construction, median commissioning costs were \$1.00 per square foot, representing 0.6% of total construction costs. The energy-savings alone yielded a median payback time on the commissioning cost of 4.8 years. For existing buildings, the researchers found median commissioning costs range of \$0.30 to \$0.50 per square foot, with whole-building energy savings of 15% and a payback time of 0.7 years.



# COMMISSIONING SERVICES

THE PLAN	DESIGN	CONSTRUCTION	ACCEPTANCE	POST OCCUPANCY
<p>Successful commissioning starts with a plan to identify the owner's requirements and a strategy to integrate commissioning throughout the project.</p> <ul style="list-style-type: none"> <li>Assist Owner in developing design requirements from an operational perspective (design Intent Document)</li> <li>Perform assessment to quantify existing conditions</li> <li>Educate team on commissioning goals</li> <li>Prepare the construction checklist</li> <li>Maintain a record of progress</li> </ul>	<p>With the program set, the design is validated for its ability to meet the client's goals.</p> <ul style="list-style-type: none"> <li>Review Design Intent</li> <li>Document for focus on the Owner's needs</li> <li>Prepare commissioning specifications for the contractor</li> <li>DD and CD design review from an operational perspective</li> <li>Identify, describe and assign each commissioning task for the project, including owner and specialist subcontractor responsibilities</li> </ul>	<p>Monitoring and validating that commissioning milestones are met during construction minimizes mistakes, oversights and delays.</p> <ul style="list-style-type: none"> <li>Integrate commissioning milestones into the Master Schedule</li> <li>Verify completion of required submittals, tests and records</li> <li>Verify installation as it occurs and witness the tests</li> <li>Verify completion of contractor start-up documentation</li> <li>Verify the quality and accuracy of Test, Adjust and Balance process</li> <li>Verify DDC controls</li> </ul>	<p>Before you use your building, we shake it down to see if it's ready.</p> <ul style="list-style-type: none"> <li>Verify accuracy, relevant and user-friendly owner training and manuals</li> <li>Perform assessments to verify all systems are ready for operation, complete, tested and clean</li> <li>Prove full integration of HVAC systems</li> <li>Conduct functional acceptance testing</li> <li>Conduct full operational training for facilities operators by using practical cause and effect drills</li> </ul>	<p>Supporting your operations through the learning curve of new facility.</p> <ul style="list-style-type: none"> <li>Opposite seasonal testing under live load conditions</li> <li>Review with facility operators trend logs, alarms and failures</li> <li>Assist in tuning control loops to meet actual and not design conditions</li> <li>Provide system manual for re-commissioning</li> <li>Provide a report to verify that owner requirements were met</li> <li>Operations review prior to the end of the project</li> </ul>



## BUILDING DIAGNOSTICS & PROPERTY SCIENCE

◦ Commissioning ◦ Retro-Commissioning ◦ Envelope Diagnostics ◦ Energy Economics ◦ Indoor Air Quality