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Energy Management Must Precede Capital Projects

By **Bill Holmes, P.E.** May 14, 2012 01:58:40 pm[Email](#)[Print](#)

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A letter to Editor in Chief Paul Studebaker:

I read your article "The Energy Performance Contract: It's Better than Doing Nothing" in Sustainable Plant with much interest. We are both very concerned and have had a number of discussions during the past year about energy, sustainability, technology, awareness, internal politics, operation and maintenance and much more. I understand that you must be objective and try to fairly examine and present the many activities occurring in this exciting field.

I think your publication is great and from feedback to some of my articles, I know it is being read and enjoyed all over the world. While we agree on many things and respect each other's experience and opinions, we have agreed to disagree on others. I am very biased. I have worked in this field for nearly 40 years and have a wealth of varied experiences. I have some very definite opinions upon which I am not willing to compromise. The primary one is that there is no substitute for applying basic engineering and management principles to actual, valid, unbiased, monitored data on an ongoing basis. Our profession has been slow to adopt this approach for reasons I have never been able to understand.

I am quite familiar with Performance Contracting and, in fact worked on a number of projects for an Energy Services Company in Boston about 10 years ago. Their objective was to sell new equipment; that was how they made their money.

While buying a new car to replace one that needs a tune up, brakes and tires would be better than doing nothing, tuning up the car, and replacing the tires and brakes offers what might be a much better solution for many people.

My recent article, "Energy Management Starts with the Art of Problem Solving," discusses the process and in some detail, the role of the primary goal or objective. Where I differ with many people in this field, not just performance contractors, is when a project starts with the assumption that new equipment - capital projects - are required. Since 1979, I have been able to produce savings of 20%, 30% and more with existing equipment in existing buildings by installing comprehensive energy monitoring instrumentation as the first step in every project and using the data to improve the management of the existing systems - the operation, control and maintenance - simply by tuning up the energy systems. The instrumentation, when designed and installed properly, is very affordable, paying itself back in every project within weeks or months.

I start each project with the goal of saving energy without a bias toward capital equipment. Where data shows it to be a good investment I present the data and recommendations to the owner. But capital projects should be the last step after all of the no-cost and low-cost changes have been made, not the primary objective. It often is not required. Where new equipment is required, I believe the environmental impact and net energy savings when considering the mining, transporting, manufacturing of the new and disposal of the old should be taken into account. Good management of existing equipment has none of those penalties.

I am not alone in my beliefs. Lawrence Berkeley Laboratories has been conducting research involving the use of comprehensive energy monitoring instrumentation for many years and their results have been very similar to my experience. These techniques are now being referred to as retro-commissioning or fault detection. I have taken the following quote from an article by Jim Sinopoli in the

Sustainability Infographics



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Author Bio

**Bill Holmes, P.E.**

Bill Holmes, P.E. founded Holmes Energy LLC www.holmesenergy.com and developed the AutoPilot Monitoring-Based Commissioning (MBCx) System in 1979. He has a B.S. and M.S. in mechanical engineering and has done additional coursework and research for his PhD. He is a former Purdue professor and taught for several years in the Continuing Education in Energy Management Program at the University of Wisconsin.

Bill has produced savings from 20% to, in a few projects, more than 50% from low-cost, no-cost changes in management, operation, maintenance and control alone in all types of facilities including Industrial Plants owned by Fortune 500 Companies.

He is the recipient of a DOE Award for Energy Innovation and was the Indiana Energy

Smart Buildings, LLC, February 2012 Newsletter titled, "The Killer App: Fault Detection & Diagnostics"

"Another example involving actual deployment and use of fault detection, and probably one of the most recent and best examples, was a pilot program at Microsoft's Redmond campus. Microsoft installed a fault detection application that could "monetize" each fault and identify the annual cost of the fault. Not only did Microsoft discover faults they were never aware of, but their engineers saved significant time in addressing operational issues. This tool allows Microsoft's typical 5-year retro-commissioning cycle for their campus to be accomplished in just one year. Annual energy cost savings for Microsoft from automated fault detection alone may exceed \$1 million.

Lawrence Berkeley Laboratories in a study on monitoring-based commissioning, an element of which is building diagnostics, showed an average energy savings of 10 percent, with as much as 25 percent in some cases. When you have organizations such as USGBC, Microsoft and Lawrence Berkley Labs broadly supporting the results and benefits of fault detection, there's something to its application."

Thanks for reading my comments. I hope "The Art of Problem Solving" article further clarifies my thoughts for you and your readers.

Keep up the great work!

Bill Holmes, P.E.

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Manager of the Year in 1990. He has published numerous papers and been making presentations on his projects and methods for more than 25 years. Bill is a sculptor, a writer and a regular contributor to Sustainable Plant.

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