# BOC Bulletin

A Newsletter for BOC Graduates, Enrollees and their Employers

SUMMER/FALL 2012




# The Evolution of an Action List

The McFarland Clinic PC is a network of healthcare facilities in Iowa that has been serving residents in ten of the state's counties for six decades. Patient well-being is a part of their vision and this extends to the management of their facilities. Over the past decade, facilities management and maintenance staff have been steadily improving the energy efficiency of the buildings in a cost-effective way, without sacrificing occupant comfort. Despite continuing to bring on more energy-hungry equipment, such as MRIs and scanners, total kWh consumption since 2000 actually dropped by over 16 percent. "We're actually doing more with less," states Ron Frantzen, director of facilities management.

*The McFarland Clinic at 1215 Duff Avenue in Ames, Iowa, built in 1962.*

## Lighting Progressions

A twenty-plus year veteran in facilities management, Frantzen started at the McFarland Clinic in Ames, Iowa in 2000. In his position, he has 19 locations to oversee, with buildings ranging in size from 2,600 to almost 130,000 square feet, totaling over half a million square feet in all. Conversant with energy-saving ideas, Frantzen began his tenure at McFarland by assessing the state of all the McFarland facilities and drawing up an action list for each. Attacking the list, Frantzen and his staff started with lighting in 2001.

Most of the clinic's buildings are several decades old. The main clinic (the largest building) was built in 1962 and had undergone three renovations in as many decades. Frantzen notes that these subsequent changes presented challenges because different systems used in the renovations had resulted in over-lamping. The clinic had over 480 can lights ranging from 100 – 150 watts. Over 400 of these used incandescent bulbs. Using CFLs as replacements, they got this down to 38 watts per can and saw an immediate drop in usage. With improvements in CFLs over the years, watt levels are now down to 18 – 28. With usage drops and utility incentives, Frantzen says that ROIs (returns on investment) for the change-outs are usually less than eighteen months. The process was repeated throughout the other McFarland buildings.

The majority of the lighting work was done by the end of 2003, but that doesn't mean it is static. "It's a continuous process as the technology changes. You have to look at everything: the type of bulb, the color-rendering you are after, changes in reflector technology. These are all factors to consider when refining the systems," Frantzen explains. He is currently looking into LED lighting, which would be in the 12-13 watt range. The initial expense is high at about $38 per bulb, but after anticipated utility rebates from Ames City Electric, payback could be less than a year and the LED bulbs and have a 40-50,000 hour life, making savings down the road even more significant with reduced staff hours for light bulb changes.

Rather than making a drastic change, Frantzen has chosen a 20-foot high atrium in the main building as a test site for the LEDs, reasoning that with any newer technology, you have to make sure the lighting suits the needs of the area.

## HVAC System that Yield Surprise Savings

Another major contributor to energy savings at the main clinic building was tying the chilled water and heating systems together from the two separate power plants. The original 1962 building was a stand-alone system. With the 1992 addition, a second power plant was installed to handle this new wing's heating and cooling loads. Neither system worked with the other. Now totalling just over 130,000 square feet, the clinic was cooled with two chillers, a 180-ton Trane chiller unit and a 350-ton York chiller. Both chillers were being used at approximately 50 percent of their capacity. Tying these boiler and chiller systems together with interconnecting piping helped to utilize the current chillers to their fullest capacity between the two buildings. Utilizing the interconnection piping between the chillers and boilers, along with new variable frequency drives (VFDs) on-air handlers, new energy thermo solution boilers, pumps, and the cooling towers has enabled them to shut off


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the 350-ton chiller and run only the 180-ton chiller. This entire interconnecting piping package upgrade investment was just over $150,000.

The total project cost was $650,000, which also included these upgrades:

- Reduced from seventeen old air handlers to eleven new ones, each having capability for full economizer mode.
- Installed three new modulating thermo energy solution boilers to replace two large hot water boilers that were both cycling nearly 60 percent of the time.
- Installed 65 volume air ventilation flow box with reheat coils.
- Achieved control functionality using the Direct Digital Controls (DDC) system with Johnson Controls.
- Installed VFD drives to reduce peak demand charges.

All of this was completed in the main medical clinic (pictured on page one) that had several additions and mixed systems. The ROI by installing interconnection piping and controls was less than two years. Results were dramatic and immediate, with a major utility drop of over $12,000 in just one cooling month. Utility demand factor charges dropped as well, from a yearly average in 2000 at 583 to a new yearly average in 2012 at 541. KWh monthly average in 2000 was 274,457 to a monthly average in 2011 at 232,935 which is a reduction of over sixteen percent. The lowest kWh was in 2009 with 198,235. The cost savings have been equally impressive since 2000. Monthly average billings were $16,376 in 2000 to a lower monthly billing cost of $13,574.

## Innovating with Controls for More Efficiency

Demand control ventilation is a strategy that controls air changes per hour based on occupancy. $CO_2$ is the proxy for occupancy. It costs money to condition air and move it around the building. If air is not needed in a space, for example an unoccupied conference room, the $CO_2$ monitors communicate with the ventilation system to minimize air flow. Frantzen took this concept further than just an individual conference room, including an entire building system. The building's automated system measures $CO_2$ levels, indicating indoor air quality. The $CO_2$ monitors are set up to override air-side economizers to kick into overdrive when needed. This triggers when more fresh air may be needed to bring $CO_2$ levels down, but Franzten reasoned it could be used in reverse.

*Ron Frantzen outside the McFarland Clinic entrance.*

Confirming his course of action with an outside engineering consulting firm, Frantzen had the idea to override this action instead by setting intake to only 5%, while closely monitoring $CO_2$ levels. He explains that when utilizing $CO_2$ sensors, fine-tuning the monitoring of these systems can help control additional energy cost. By simply setting up your DDC system to monitor a maximum $CO_2$ level in your facilities during high outdoor temperatures, for example 90-95 degrees, the mechanical and DDC control systems work together and can keep your chiller load down by reducing the economizer air intake. Remember that 90-95 degrees has to be cooled to 50 degrees or less to meet building demands. As long as your $CO_2$ levels do not rise, you can limit the economizer intake by $CO_2$ monitoring. If the $CO_2$ levels begin to rise, then the economizer is enabled to modulate as needed to bring levels back in line.

Using this method, the chilled water system went from the mid 50s back to 42 degrees in rapid time. $CO_2$ levels stayed under control and the 350-ton chiller was not required. Frantzen does say they run it periodically as a backup for the 180-ton chiller, but so far, that is the only time they do run it.

Installing more controls, more VFD drives throughout the system, and continuing to chip away at older technologies have also been parts of the action list. Water consumption and associated sewer charges are also a concern and Frantzen says that they have dramatically reduced usage and costs by installing low-flow faucets and toilets. Renovations are constant and the priority is to make the best choice at the best cost.

## Thinking Forward

It's not all renovations though. This fall will see the opening of two new medical facilities. There will be a new 45,000 square foot multi-specialty medical clinic in Carroll, and they are also moving into a new 25,000 square foot medical office building in Ames, in both cases utilizing geothermal systems. "While the initial cost is higher and the payback time is longer than other energy efficiency projects we have undertaken, it comes down to be being a community leader in energy conservation projects. Considering the long-term payback with energy efficiencies and knowing it is so good, you can definitely make the case," says Frantzen, excited at the prospect of the technology.

Also, the rebates for building automation and energy efficiencies upgrades have been outstanding. In Carroll, McFarland Clinic will receive over $114,000 in rebates from Mid American Energy. The project in Ames should receive a rebate of approximately $49,000 once completed.

The action list is a great procedural idea, especially when it coincides with the ability to refine and adapt, and to react with new ideas and technologies – to evolve the list. Frantzen's action list of 2000 fits that concept to a tee and, together with his team of BOC grads, the list continues to evolve.

## McFarland's BOC Team

BOC training emphasizes looking at the whole picture. Ron Frantzen first heard of the training three years ago and "thought it sounded like something for me. I took the classes and decided to have my entire facility management team take them as well."

The staff had to do it over two years, but are all 100% BOC certified as of July 2012. Frantzen then hopes to be able to have a level II series training in the area that they can all attend and become BOC II certified as a team. He says, "The staff has truly appreciated the opportunity for credentialing, since many of us have come either directly from high school or trade school."

Congratulations go out to McFarland's BOC graduates: Tom Bell, Randy Bitz, Scott Cochran, Denny Elliot, Matt Pflug, Chuck Pille, Jim Thomas, and Craig Walker.

# BOC Grads Making a Difference

## Out-of-the-Box Thinking in Maine

***Lewiston and Brunswick school districts.***

BOC graduate **Paul Caron** always seems to be moving forward. After high school, Caron trained to be a master electrician, both at vocational school and in the U.S. Army, eventually starting his own electrical services business and then branching out into the data and telecom sectors. Always up for a challenge and with a strong background in "making things work," Caron eventually moved into facilities management, first as director of facilities at Clover Health Care/ Continuum in Auburn and then in the K-12 education sector in both the Lewiston and Brunswick school districts.

**Paul Caron**
*Facilities Manager*

In talking with Caron, his enthusiasm for his work highlights the obvious facts that he 1) likes to learn, 2) relishes a challenge, and 3) combines #1 and #2 to make things happen. As he states on his informational blog, "I have enjoyed working as a facilities & project director for the past ten years and my skills have continued to expand and adapt along the way with special focus on energy, security, and budget reductions."

Caron is both a BOC level I and level II graduate and has a great appreciation for the training. "A lot of light bulbs went off in BOC. As they talk about different aspects of building management, things start to gel and you see more associations and dependencies. You look for alternative ways of doing things that 'fit' your buildings and locations," he states. And his projects have indeed investigated interesting alternatives.

When at Lewiston School District as director of facilities and projects, Caron was tasked with determining the best method for revamping the lighting systems at two of the existing elementary schools, as well as investigating the best options for two new high-performance elementary schools. "Nowadays, I'm all about control versus equipment – controls and measurement," says Caron. He looked into daylight harvesting options. The lighting controls system they chose to use seemed an expensive option initially, but the savings, which came in at better than 60% (as measured at the first school retrofitted on a 20-day cycle by Efficiency Maine, a long-time BOC program sponsor), were undeniable. The vendor savings estimate had been about 50%.

It might seem counterintuitive that Maine could be a location ripe for daylight harvesting, but Caron explains. "So much depends on the situation of the rooms, how much light they actually get, and how and when the space is being used. Sun coming into the classrooms at a lower angle means that more natural light is actually available. The sensors in the system can adjust to the level of light needed, which consistently cuts energy use."

Now facilities director at the Brunswick School Department, Caron's latest challenge is a geothermal energy system at the Harriet Beecher Stowe Elementary School. A big proponent of Peter Drucker's philosophy, "What gets measured, get managed," Caron recognizes that while geothermal energy in the ground is free, there's certainly a cost to getting it out! Since the system was just deployed in the fall of 2011, hard savings numbers cannot yet be gleaned. And the question would also be, how would you measure the savings of the system against the resources being used to harvest the geothermal energy? The various components of the geothermal extraction process would have to be measured separately. He concentrated on the HVAC system for measurement and picked the brains of people in the field to see what he could come up with to do this. Results of his ingenuity to "measure and manage" can be seen on the facilities page of the Brunswick School Department site (www.brunswick.k12.me.us/facilities/ or http://pcaron7.wordpress.com). Each component is tracked individually to determine how much electricity is actually used and what it then costs to *create* geothermal electricity, giving a measure of how sustainable the "free" energy will eventually be.

"I believe that checking the system throughout an entire year would yield the most useful information, but just started posting results in February, measuring at six-minute intervals. So while we know we're saving money and energy, the whole picture is not yet clearly measureable. But it's very exciting," notes Caron.

As Caron says above, BOC training turned on some light bulbs and got him thinking about possibilities he hadn't considered. Another advantage of the training he sees is that class attendees come from a variety of backgrounds and that it is useful to bounce information and ideas around – just to see what people were doing in their own buildings and how they were solving their particular problems. Efficiency Maine's Program Manager Tim Vrabel considers Caron to be one of best facilities managers in the state and certainly, the strides Caron has made at both Lewiston and Brunswick are impressive. Somehow you just wonder what he'll think of next!

## More Proof that Teamwork Works

***Pace Dairy, a Kroger subsidiary in Rochester, Minnesota***

**Tim Hunsucker**
*Maintenance Supervisor*

For the last five years, Tim Hunsucker has been the maintenance supervisor at Pace Dairy, a Kroger subsidiary in Rochester, Minnesota. A BOC grad of both levels I and II, he and his group understand the importance of improving energy efficiency at their facilities, and so began that process earlier in his tenure by targeting the usual suspects, such as lighting retrofits. One of the first tasks though, was to engage the rest of their associates and give them an insight to their impact on the various building systems and the associated costs.

Efforts paid off and for 2010, Pace Dairy received the Energy Star Challenge for Industry Award from the Environmental Protection Agency for having reduced its energy use by 12.6% over the previous year. The process began with an internal energy audit targeting energy use, but became much more in 2011, with efforts expanding beyond energy savings.

Sustainability was and is a corporate goal and they needed a plan to accomplish this. Bringing in outside experts to verify and expand the findings of their own internal audit, they partnered with local utility (and BOC sponsor) Rochester Public Utilities (RPU) to develop a strategy. "A plethora of people were involved in the project," says Hunsucker, noting that

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***BOC GRADS** (Continued from page 3)*

RPU's Jan Blevins and Tom DeBoer, along with the University of Minnesota's MNTAP (Technical Assistance Program), were exceptionally good resources, helping with data, networking, and in navigating the rebate/incentive system.

A chief factor in the success of the venture has been communication – a focus from inception of the project. Communication makes it much likelier to get buy-in and cooperation from all involved. "You can engineer all you want but if you can't change the culture, it won't work. You have to have the people on board," says Hunsucker, noting that employees have been "outstanding" in this regard.

To accomplish this, they developed a procedure to enable employees to easily report inefficiencies they spot or any ideas they have for improvement in energy savings or recycling and waste reduction. Yearly incentives are provided by way of a "return bonus" and good ideas are publicly acknowledged. Success stories are also highlighted on the company's internal website and newsletter. The team meets monthly to review employee ideas and recommendations and these, as well as the latest accomplishments, are shared at the corporate level. One example of employee input was Lisa Fox, an overwrap operator at the plant, who implemented the startup/shutdown procedures for the plant's equipment on the process side of the operations.

> ***"You can engineer all you want but if you can't change the culture, it won't work. You have to have the people on board."***
>
> *– Tim Hunsucker*

In its efforts at sustainability, the company is also concerned with its responsibility to the community. "As we developed our plan and prioritized the next steps by cost and return, we also looked at our impact on the community and ways to reduce our carbon footprint," Hunsucker explains. An example: For 2011, 2.6 million pounds of waste was produced. Of that, 1.6 million was recycled and the remainder went to the local Olmsted incinerators. Nothing went to landfill.

A number of efficiency measures were taken in 2011 under the auspices of the energy/sustainability team: air leak repairs, a load profile program to determine and adjust demand, relighting and occupancy sensor installations, upgrading and scheduling boilers. The list goes on, and with the efforts of the entire team Pace Dairy received RPU's Environmental Achievement Award for 2011.

Dean Laube was one of Hunsucker's BOC instructors. Of his BOC pupil, Laube notes that, "He was really motivated by the energy team concept. The Kroger team success is due in large part to Tim's enthusiasm and willingness to push for projects that clearly made economic sense but may have not gotten the attention because they weren't driven specifically by production, but rather energy. I've taught energy management courses for over a decade now and he would be the poster child for "gold standard."

A plan put in place and well-executed to bring the multiple people and areas affected certainly takes effort and persistence. And when the pieces come together to yield some great results, it means that teamwork, well, works!

## Training Yields an Expanded Outlook

***Rowan-Cabarras Community College***
***North Carolina***

**Mike Efird**
*Maintenance Technician*

Mike Efird, maintenance technician at Rowan-Cabarras Community College's (RCCC) North Carolina Research Center campus in Kannapolis, is one of the many BOC graduates to complete the program under the ARRA/North Carolina Energy Office funded training. *(See details of the program on page seven.)* Fifteen years in the business, Efird is licensed in plumbing, electricity, HVAC, and general contracting and has been with RCCC for three years now. When funds came through for BOC training, Efird was one of the RCCC facilities management staff selected to attend classes.

"To be honest, when I first heard we were to go to the class, I wasn't really enthused about it. Our instructor, Hank Jackson, in particular really made it interesting and had a very broad-based knowledge of facilities." Efird had been thinking that it would be more along the lines of a refresher course for him but was surprised and pleased to find that there were approaches to facilities management the training provided that he had not considered before.

RCCC has five campuses in two counties. Efird's responsibility is the research center, three stories high with 70,000 square feet of space. At only two years old, the LEED-constructed building is state of the art, but buildings don't manage themselves and they also aren't static. Uses change, technology improves, installations that may have seemed correct may have other, more cost-efficient solutions.

> ***"To be honest, when I first heard we were to go to the class, I wasn't really enthused about it. Once they started the class though, I really enjoyed it."***
>
> *– Mike Efird*

For example, one class talked about state building requirements, in particular, lighting standards. Efird examined his building's lighting and found it was over-lamped by about three times state standards. Granted the guidelines generally refer to minimum requirements, but three times is significant. "We may start by cutting back on lighting. Cutting back in the hallways alone would account for 4,000 watts of electricity."

Studies indicate students learn more effectively in well-lit spaces. This evidence drove the design team to configure tall windows in classrooms on the exterior walls of the building and to seek opportunity for daylighting practices. "Of course we have occupancy sensors, but habits die hard and often the first thing someone will do on entering a classroom is turn on the lights, which could be totally unnecessary on sunny days," states Efird. Cultural changes (breaking people's habits) and/or light-level sensors are some options to consider.

To Efird, one of the main purposes of the training is to "make you know your equipment" in terms of how it should be properly used at your specific facility. "The more you know about how they work, the more you know how to maximize their use," he notes.

He also notes that the local utility companies, in his case Duke Energy (for electricity) and PSNC (for gas) have been great resources. "We went to them to get our historical usage data and they also helped with building audits and suggestions on energy tracking. Our other campuses are single meter tracking and we're working with Duke Energy to submeter various buildings so that we can have a better understanding of individual building usage."

A big challenge ahead for Efird's particular building is tackling its per foot energy usage. "One of the projects in the course series was to collect a year's worth of energy consumption data and to use it to generate an energy use intensity (kBtu/sf/year) for the building using ENERGY STAR's Portfolio Manager. We found that, despite being a LEED-constructed building that is only two years old, when measured against the other buildings at RCCC, we had the highest per square foot energy usage," he says. The reason? Unlike the other campus buildings, the research center under Efird's supervision has a biotech building with a laboratory that uses 18 lab hoods that continuously take out the air – removing air-conditioned air in the hot weather and heated air when it is colder. Below the hoods are enclosed storage spaces that require a dry, air-controlled environment. But Efird believes they will find an equitable solution by doing some research of their own, talking with other like-facility building operators.

"Our class had people from eight other community colleges and the networking is such an advantage," says Efird. "Being able to exchange ideas and find out how other people are addressing their issues is a real benefit."

While Efird is in a relatively new and high-tech LEED building, he sees that managing it is a continuous process. "The program's training gave me a greater awareness of the different aspects of energy conservation and sustainability," he concludes.

## Training Promotes a Variety of Applications

***Kaiser Permanente, Oahu, Hawaii***

Donald Yonamine has been with Kaiser Permanente for 20 years, but not always as a maintenance engineer. He actually started with the company as a certified optician and practiced that profession for almost 17 years. "Our department was next door to the engineering and maintenance department and I started to make friends with several of the staff. I asked them a lot of questions!" Yonamine explains. Questions led to classes (he got his HVAC/R certification) and classes led to a career change. He has been in Kaiser's facilities engineering department since March 2005.

Yonamine started at Kaiser's main complex, Moanalua Hospital, in Honolulu but transferred to the clinical side two years ago and is now responsible for 13 facilities on the island of Oahu. His department director, Tony Moiso, had originally been with Kaiser in Oregon and was quite familiar with BOC so that when the program came to Hawaii, he encouraged his staff to take the training. "I was one of the lucky ones on our staff to be among the first to take the course," says Yonamine.

That particular class finished just this past spring and Yonamine hit the ground running. The first project was a test change-out of T12 40w lighting to low wattage T8s 25w. "We used a small sampling of half of one of the departments and came up with a calculated savings of 6,535 kWh per year. Estimated Annual savings for this project is about $2,000. Translating this to the entire building will mean a savings of about 50% annually including LED exit lighting once we've completed the work." With rebates from local utility Hawaii Energy of $7.50 per lamp, $20 per occupancy sensor and $25 per LED exit light, the project has a payback of less than a year.

> ***"... this program really opened my eyes more to what's going on around me and what I can do myself, at work and at home, to contribute to the overall picture of saving energy."***
>
> *– Donald Yonamine*

The next project was an assessment of the HVAC systems. Yonamine identified three bad actuators and a broken three way valve on a chill water air handler unit. Repairs and tuning are key and this tweaking, a no-cost/low-cost solution, makes all the difference to efficient operation. Yonamine also instituted a scheduling program. "We had been running operations 24/7, so I gradually, maybe an hour at a time, rescheduled operations." No one noticed a difference so the transition was smooth. "I was able to shave off 6 hours per day of run time."

One of the major projects they are looking into is using photovoltaic systems. Hawaii is a natural for this type of sun-sourced energy but systems have been costly to implement and thus not always a first choice. "In talking with John Bendon, one of the BOC instructors, I learned that costs had come down and that paybacks could be as little as three years or so," says Yonamine. While one or two sites will be used as tests, Yonamine says that the expectation is that they will eventually have all of Kaiser's buildings throughout the islands committed to using photovoltaic energy.

On the personal side, Yonamine is looking into a photovoltaic system for his home. "Electricity costs can run between $200 to $400 monthly for a house. I have friends that have converted to photovoltaic and have reduced their charges to less than $10. While the initial outlay is high, the shortened payback time makes it a really good option at this point," he says.

*Donald Yonamine (on left) with instructor John Bendon.*

Yonamine says that the BOC training "enhanced my awareness of wasting energy and looking for opportunities to save. Living in Hawaii, I'd like to think we take pride in caring for the Aina (Hawaiian for land), not wasting anything, and utilizing our natural resources. But this program really opened my eyes more to what's going on around me and what I can do myself, at work and at home, to contribute to the overall picture of saving energy and self-sustainability."

"This BOC class has been a great benefit to me and my company. I know we will be taking a very aggressive approach to be a sustainable company, going green, and saving energy in the near future and this means I will have many opportunities to utilize what I have learned." BOC

## Getting Credentials to Gain Employment

A major part of BOC training is its practical hands-on approach, which includes completing a specific set of five projects at the trainee's own facility. But what of those in the field who are unemployed due to cutbacks, enrolled in BOC, and have no facility to use for project work? To address this issue, NEEC and IFMA Seattle partnered for a special BOC training with excellent results.

> *"What a wonderful opportunity I was given participating in the BOC mentor program. Working with Dennis Heller, the program facilitator, we were able to develop a great program for two operators, Michael and Aaron."*
>
> *– Lee Richardson*

In the spring of 2011, the partnership ran a BOC course for unemployed but experienced building operators looking for skill enhancement to improve their job search prospects. NEEC and IFMA recruited five IFMA members to mentor small groups of two or three BOC students each with the in-facility project assignments required as part of the BOC course. The goal was to have a BOC training series with a 50/50 split of employed/unemployed facilities workers. Tuitions for unemployed workers were supported by ComBuild, a Department of Labor partnership grant targeted to preparing building operators to become proficient in energy efficiency and renewable energy.

Lee Richardson, facility manager at Experience Music Project (EMP), was very happy with his experience as one of the five mentors. "What a wonderful opportunity I was given participating in the BOC mentor program. Working with Dennis Heller, the program facilitator, we were able to develop a great program for two operators, Michael and Aaron. EMP Museum is a great facility to study, and providing mechanical rooms, drawings, and hands-on experiences was not difficult." Even better, the program resulted in EMP hiring one of the two BOC trainees and Richardson looks forward to mentoring again.

Four months after the conclusion of the training, 70 percent of the unemployed participants had jobs in their field, supporting efforts in energy management. Feedback from the participants in the training indicated that the mentoring was invaluable in terms of exposure to employment opportunities, as well as giving them updated hands-on experience, which would be attractive to potential employers.

The program model was also successfully implemented in Oakland, California. Three facilities management people, from Macy's, UC Berkeley, and Data Domains, were recruited to participate as mentors and job placement was 38 percent in the two months following completion of the training.

Additionally, BOC partner MEEA (Midwest Energy Efficiency Alliance) is implementing its own BOC training and mentoring program for returning veterans in Illinois. At the June 2012 Clinton Global Initiative America meeting in Chicago, it was announced that MEEA is joining with the Illinois State Energy Office, the State Office of Employment and Training, and the Illinois Department of Veterans' Affairs to ensure that 40 participants will be able to take advantage of BOC training. With an estimated 100,000 returning veterans expected to enter the job market in 2013, the endeavor will address the growing needs of this population. Many of these men and women have skills in building operation and maintenance which could translate readily into facilities management. Industry-related training and credential programs in energy efficiency such as BOC can target these skills and enhance the new job-seekers' marketability.

## NEEC Earns 2012 Energy Star® Award for Excellence

The U.S. Environmental Protection Agency (EPA) has named the Northwest Energy Efficiency Council (NEEC) as a 2012 ENERGY STAR Award for Excellence in ENERGY STAR Promotion winner for its outstanding contributions to reducing greenhouse gas emissions by sponsoring significant consumer education efforts promoting energy-efficient products through its Building Operator Certification (BOC) training program. NEEC's accomplishments were recognized at an awards ceremony in Washington, D.C. on March 15, 2012, which marks the 20th anniversary of ENERGY STAR. Award winners are selected from about 20,000 organizations that participate in the ENERGY STAR program.

Since 2005, BOC has integrated the ENERGY STAR Portfolio Manager benchmarking tool into its training curriculum to advance use of the tool. In 2011, BOC-certified operators using Portfolio Manager in conjunction with operational best practices saved an estimated $45 million in energy costs for their companies.

And we at NEEC thank you, our students and graduates, as well. This would not have been possible without your enthusiastic participation and dedication, as well as the implementation of your BOC training at your facilities!

## Explore BOC's New Updated Curriculum!

The profile of the building operator has changed dramatically over the past several years with new focus on technology and efficiency. Are you keeping up with these changes? How does your skill set match up with the new demands of today's building operator?

The Northwest Energy Efficiency Council (NEEC) conducted a job task analysis for building operators and, with the findings, developed a skills assessment test for building operators interested in assessing their strengths and weaknesses in the dynamic field of facilities management. You can investigate NEEC's findings and take the skills assessment test at the BOC web site: http://www.theboc.info/pdf/ENERGY-CONSERVATION-SKILLS-INVENTORY_FORM_distr.pdf.

Also, in keeping with the BOC's ongoing commitment to maintaining the relevance, quality, and vitality of its training program, in addition to updating all Level I course manuals, the BOC program is pleased to announce the introduction of three new courses. These courses, available in select locations in 2012 and widely available in 2013, will devote more content to the topics of HVAC controls, low-cost operational improvements, and building scoping for energy efficiency.

### BOC Level I Certification

The Level I series comprises 74 hours of training and project work in building systems maintenance. Courses include: Energy Efficient Operation of Building HVAC Systems, Measuring and Benchmarking Energy Performance, Efficient Lighting Fundamentals, HVAC Controls Fundamentals, Indoor Environmental Quality, Common Opportunities for Low-Cost Operational Improvement, and Building Scoping for Operational Improvement.

### BOC Level II Certification

Level II has 61 hours of training and project work in equipment troubleshooting and maintenance. Courses include four core classes and two supplemental classes. The four core classes include: Preventive Maintenance & Troubleshooting Principles, Advanced Electrical Diagnostics, HVAC Troubleshooting & Maintenance, HVAC Controls and Optimization. See the website for supplemental class topics.

To find and register for a Level I or Level II training in your area, please visit the BOC website at www.theBOC.info.

## North Carolina Community Colleges Training Update

The last BOC issue noted that North Carolina's community colleges had received American Recovery and Reinvestment Act (ARRA) funds for BOC training through the North Carolina Energy Office. ARRA funds paid the cost of classes, materials, and travel. Training began in May of 2011 and finished up just this past March, with more than 162 facilities maintenance personnel trained and a certification rate of well over 90 percent.

BOC in the state is administered through the state's community college system, with four colleges taking lead as resources for training: Asheville-Buncombe (A-B Tech) Technical Community College, Caldwell Community College & Technical Institute, Durham Technical Community College, and Edgecombe Community College.

"The focus of the grant was not only training facilities personnel, but also training instructors to continue the curriculum," says Stewart Chason, Coordinator of Workforce Development at A-B Tech. Chason emphasizes that while the focus was on training higher education facilities personnel, having an increasing number of credentialed building operators gives the program a higher profile and a proven track record of energy savings. "One of my goals is to get recognition of the program to a wider audience and more private industry, who could serve as sponsors for the training, either in-house for larger companies, or through our current community college system," continues Chason.



Gayle Phipps, head of facilities maintenance for Rowan-Cabarrus Community College (RCCC), went to the training with four of his staff. "I hope to send five more people in the fall and thought the program was very good, covering a wide range of topics. We are and will implement energy saving techniques learned from BOC, such as tracking energy usage and tweaking the energy management system," states Phipps.

Two graduates of the training from Surry Community College, Dale Jessup and Jerry Snow, were featured in their local newspaper after they completed training and began logging energy efficiency records to determine ways to save energy and money for the college. Jessup, with twelve years of experience in the HVAC/R, electrical, and plumbing fields found training very beneficial. "The topics that were covered were in-depth and relevant to my job," he says. "The classes helped me improve our lighting efficiency and understand all our options for those improvements. It's a great program to improve your skills in facilities management and to train your employees."

*(See page four for a related piece on RCCC BOC grad Mike Efird.)*

## BOC Joins Facebook!

BOC has joined Facebook to provide our audience with the most up-to-date information about continuing education opportunities, BOC classes in their area, industry news and trends, hot tips for their toolbox and more. If you "like" what you see, please share our page with others.

## Call for Feedback and Projects!

Our publication aims to highlight new technologies, relate success stories of graduates and get the word out about new ideas in the facilities management industry. We are open to suggestions: What would you like to read about?

All readers are encouraged to submit their thoughts on content they would like to see, technologies that spark their interest on which they'd like more information, or their own personnel successes as energy-efficient facilities personnel

Please, submit your ideas to email address: news@theBOC.info. You can also submit your own successful project story at the BOC web site (www.theBOC.info) under the "For Graduates" section. We'd love to hear from you.

## National Conferences & Symposiums 2012-2013

### GovEnergy 15th Annual Workshop and Trade Show

St. Louis, Missouri
August 19 – 22, 2012
**More info:** www.govenergy.com

### Labs 21 2012 Conference

San Jose, California
October 2 - 4, 2012
**More info:** www.labs21century.gov/

### NFMT (National Facilities Management & Technology Conference/Exposition) Vegas

Mirage Event Center
Las Vegas, Nevada
October 2-3, 2012
**More info:** http://www.nfmt.com/vegas/

### IFMA World Energy Engineering Conference

Henry B. Gonzalez Convention Center
San Antonio, Texas
October 31 – November 2, 2012
**More info:** www.ifma.org

### GreenBuild International Conference & Expo

San Francisco, California
November 14 - 16, 2012
**More info:** www.greenbuildexpo.org

### Midwest Energy Solutions (MES) Conference

Fairmont Hotel
Chicago, Illinois
January 16-18, 2013
**More info:** www.meeaconference.org

### NFMT (National Facilities Management & Technology) Conference/Expo Baltimore

The Baltimore Convention Center
Baltimore, Maryland
March 12-14, 2013
**More info:** www.nfmt.com/baltimore/

# Bright Ideas from Buildings.com

## *Learn how to save time, save money, and save your sanity*

By Kylie Wroblaski

When it comes to doing your job, what is your greatest resource for learning about new ideas and strategies? BUILDINGS believes that you, our readers, can be your own greatest asset when it comes to implementing new ideas or changing strategies.

Learn how facility managers in buildings across the street and across the country are saving time, saving money, and making their jobs just a little bit easier.

We know bright ideas are not limited to the following small sample. Do you have a great method for cutting your utility bills, reducing maintenance costs, or doing more with less that you would like to share? If so, contact Chris Olson (chris.olson@buildings.com) or another member of the BUILDINGS editorial team.

### 1. LET THE SUN SHINE IN

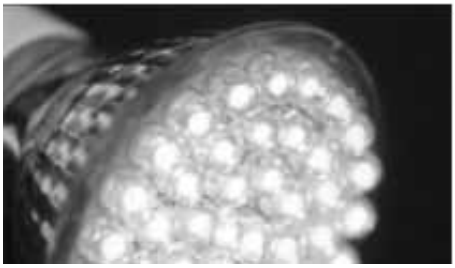
"Why pay for expensive electricity to illuminate your factory floor when you can have Mother Nature do it for free?" asks Keith Hussinger, plant manager for ***Kelly-Moore Paints.*** The company recently renovated part of its production facility in San Carlos, CA, and opted to increase the number of skylights from 4 to more than 20. "What a difference this made in lighting! Not only did we reduce our electricity consumption by more than 40%, but the overall illumination of the factory floor is far better than before."

### 2. INTRODUCE INDUCTION

When the ***University of North Dakota (UND)*** decided to upgrade the campus' outside lighting, it opted to convert from high-pressure sodium to induction lighting due to cost savings and increased life. "The cost savings is anticipated to be $7,800 per year in utility costs," says Larry Zitzow, director of facilities management for UND. "In addition, savings in maintenance should be realized as induction light bulbs last for 100,000 hours compared to 25-30,000 hours for sodium."

### 3. MANUALLY PREPARE

"Someone once said 'If you want to hide something, put it in the manual,'" says Mark Galbraith, manager of design and construction for ***Northwest Missouri State University***. He advocates reading, rereading, and referring to the manual. And age of equipment isn't an excuse. "No matter how old a piece of equipment is (with a few exceptions), information can be found on the Internet. 'I don't know' isn't really a valid answer anymore because Google knows."



### 4. SEE THE LIGHT OF LEDs

***Woodbine Entertainment Group (WEG)*** is embracing emerging technologies as part of its plan to reduce energy consumption, and LED lighting is one of these technologies. WEG recently completed a relamping project at its Woodbine Racetrack in Toronto, replacing the fluorescent fixtures in the main service corridor with LEDs. "This resulted in a 15% combined reduction in electrical consumption fixture for fixture while using 10% fewer lamps," says Wendy Loiselle, senior manager of corporate social responsibility with WEG.

In addition, the main neon entrance sign was replaced with a brighter and more energy-efficient LED lighting system, saving 16,100 kWh per hour, or 70,518 kWh per year. "Based on a 12-hour operating schedule, this represents an annual energy savings of $7,052 plus a further $40,000 reduction in yearly maintenance and repair costs."

### 5. STEP DOWN LIGHT LEVELS

Your city code may require bright lights in your emergency stairwells, but how often are these stairwells – and the lights – actually used? To cut the costs associated with paying to light an area that is rarely used, a ***Jones Lang LaSalle*** property manager at a northern California building worked with municipal officials to allow bi-level lighting in the building's emergency stairwells. "Most of the time, lighting levels are kept low to save energy," explains Hal Brownstone, group manager of property management services for Jones Lang LaSalle. "When anyone enters the stairwells, motion detectors immediately shift to high-level lighting. Putting in the lighting costs $60,000 and returns about $16,500 annually in lower energy costs and utility rebates, for a payback period of 3.6 years."

### 6. "AUTO"-MATICALLY RESTORE FAUCETS

Cleaning automatic proximity-sensing faucets with abrasive media scratches the window that protects the retro-reflective eye, which causes the IR beam to scatter. This leads the faucets to fail and requires you to replace them. Or does it? ***Crockett Facilities Services*** found a simple fix to restore the faucet's functionality instead of opting for a replacement. "A car headlight restoration kit can quickly and inexpensively polish the lens," explains Diane McClelland, marketing director for the company "The time and cost savings are substantial – $40 for the headlight kit compared to $300 for a new faucet."

### 7. ACTIONS SPEAK LOUDER

To get around staff diversity and potential-language barriers, Donald White, director of safety and security for Northern Virginia Mental Health Institute, uses the "look-see-do" method when it comes to training. This method works especially well for training staff members to properly use fire extinguishers and material safety data sheets (MSDS). White demonstrates the correct technique, splits training attendees into small teams, and has each team role-play the challenge. Each team is applauded and rewarded with small,

useful prizes like pocket-sized LED flashlights. "Didactic training engages everybody to their abilities, regardless of any existing disabilities, or even language proficiency," he says. "Animated training is skill-based, memorable, and fun!"

### 8. RE-COMMISSION TO REDUCE REPLACEMENTS

When ***Bible Broadcasting Network*** moved into a building that was more than 25 years old, it began testing every building system because "you cannot assume anything in a more than 25-year-old facility," says Jeff Blodgett, the network's facility manager. Blodgett found that the pressure- reducing valve on the domestic waterline was not just slightly off, but completely broken. "We were passing 125 psi to our entire building plumbing system and having trouble keeping up with flushometer valve replacements. After replacing the pressure-reducing valve, our plumbing issues fell to nearly zero and I am confident that our water usage dropped dramatically."

### 9. INFRARED IS A HOT TECHNOLOGY

Using infrared technology to identify concealed moisture in your roofing system can provide you with significant cost savings and extend the service life of your roof. With this technology, you can avoid complete replacement and prepare your roofing system for recover installation by surgically removing and replacing wet components with new dry components, says Ben Ansley, president and principal with Hixson Consultants, Inc. "Considerable savings may also be achieved by utilizing infrared thermography to identify and correct moisture intrusion issues prior to the end of contractor and manufacturer warranty coverage."

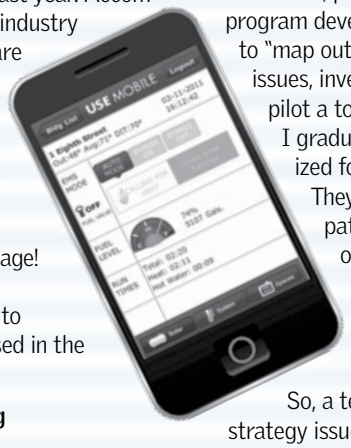
*This edited article originally appeared in the September 2011 issue of Buildings magazine and is reprinted with permission. For the complete version of "Save Your Time, Your Money, and Your Sanity with These Bright Ideas from BUILDINGS" please visit the site at www.buildings.com and choose the published month for the piece. The direct link is:* ***http://www.buildings.com/Magazine/tabid/3070/IssueID/544/Default.aspx***

*You can earn 1 hour of credit towards your BOC renewal by taking a quiz based on the material in this article at* ***www.theBOC.info****. Find it in the "News" section.*

## Mobile Apps in Facilities Management

The January issue of Buildings.com has an extensive article on the use of mobile apps in facilities management. Written by C. C. Sullivan, *Facilities Management Mobile Applications* contends that, while remote control technology has been around since the early 80s, the rise of the smartphone has made the technology much easier to use.

The author points out a research study that indicates smartphone purchases are estimated to quintuple in 2012 over last year. Accompanying this rise is that of an industry dedicated to providing software applications (apps) for mobile devices. Many target facilities management professionals with the aim of making ever more complex facilities easier and more efficient – and mobile – to manage!




The core functions applicable to facilities management discussed in the piece are:

- **reporting and tracking**
- **data collection**
- **maintenance and inventory control**
- **computation and calculation.**

Sullivan details some of the various apps available and how to assess which will work for you and your facility's situation. Discussion of specific products lets you navigate the maze of app possibilities.

To read this article in its entirety, check it out at: http://www.buildings.com/ArticleDetails/tabid/3334/ArticleID/13457/Default.aspx

## Future FM Resource: Online Communities of Practice

Mobile apps becoming more prevalent in facilities management will mean a greater reliance on communications technologies for building operators, which means more smartphones. But while apps facilitate the collection and processing of data, are there other online options for information exchange?

BOC students often cite networking as a training benefit, how meeting their peers always leads to an exchange of knowledge and ideas. Many stay in contact with instructors and fellow students for just this purpose. Would this comfort level of "picking up the phone" translate to an online exchange of ideas format?

Researchers at the City University of New York's School of Professional Studies (CUNY SPS) wanted to find out and crafted a study in concert with facilities maintenance personnel who had completed BOC level I training. They solicited volunteers to participate in an online community of like-professionals that would promote the exchange of knowledge and problem-solving – a sort of facilities management Facebook.

Patrick Dail, project director at CUNY SPS's program development unit, formed a team to "map out the strategy, weigh potential issues, investigate technology options, and pilot a tool." The team invited BOC level I graduates to join a Ning site customized for their online communication. They saw a promising initial participation rate of about 27 percent of the total learner audience. As time progressed, only about 5 percent of participants actually used the site.

So, a technology issue? A program strategy issue? A participant demographic issue? Probably a combination. "While comfortable with cell phones and text messaging, the audience selected for the pilot are not generally smartphone users," explains Dail, "nor are they Facebook or LinkedIn users." The "chat" aspect of the online community of practice was separate from their typical behaviors – perhaps too much of a leap. He suspects that, had the team integrated the Ning site into part of a level I training as a teaching tool, the outcome may have been different.

He's probably right. As smartphones become more commonplace, so too does their functionality. As apps become a part of the FM scenery, so too will online FM communities.

According to a *Building Operating Management* survey, 49 percent of facility managers are on Facebook, 23 percent on LinkedIn and 13 percent have Twitter accounts. But overwhelmingly, it is strictly for personal purposes. Most are passing by opportunities to use these communications tools to help them network, keep up on industry developments, position themselves as thought leaders and advance the business of their organizations.

Read about how facilities personnel can benefit from social media. http://www.facilitiesnet.com/facilitiesmanagement/article/How-Facility-Managers-Can-Benefit-From-Using-Social-Media--13196

## Check out BOC's Technical Webinar Series!

The BOC web site (www.theBOC.info) offers webinars, both live and prerecorded (available for viewing at your convenience). Register and receive a link, with log-in and password information. Successful completion of each webinar and its accompanying quiz earns you 1.5 continuing education hours towards maintaining your BOC certification.

**The final LIVE webinar offered in 2012 will be held from 10 AM to 11 AM Pacific Standard Time on September 19th and will cover:**

- ***Energy Savings through Recovery***

Information on fees and registration is available at the BOC web site listed above. A link to the webinar details can be accessed on the home page.

# New to BOC?

### Listen to a FREE Informational BOC Webcast:

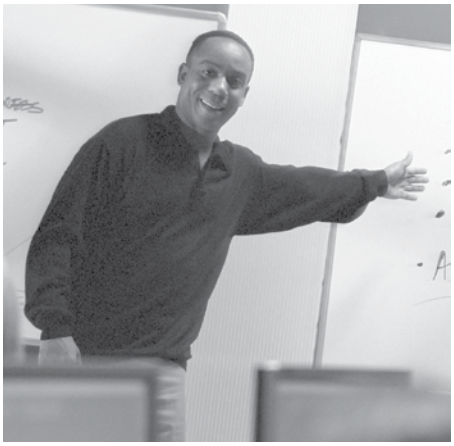
BOC® Informational Webcasts are for newcomers to the program. Learn about Level I and Level II course topics, schedules and certification requirements in detail. Listen in and find out who benefits by attending BOC training and how graduates are improving their facilities.

Informational webcasts last approximately one hour, starting at:

8:30AM - 9:30AM (PST)
9:30AM - 10:30AM (MST)
10:30AM - 11:30AM (CST)
11:30AM - 12:30PM (EST)

The final webcast for 2012 is scheduled for **September 12th.** If you cannot make that final date, please note that pre-recorded webcasts can be downloaded from the BOC website 24/7.

**To sign up go to: www.theBOC.info**

## BOC Explores Online Training Delivery

In June, BOC partners MEEA and NEEC administered a survey about BOC graduates' interest in and experience with blended classroom/online and online-only learning platforms. Over 900 BOC graduates and supervisors participated in the survey across 29 states and gave their views on the pros and cons of each delivery method.

The survey response will allow BOC to provide better options to make continued development of facilities management skills easier and more available to its audience. Survey results show that, generally, participants prefer classroom-based learning, but that many are open to a combination of classroom and online training. Very few (less than one in five) felt that the learning experience should be solely online.

The survey results affirm the need to have a blended learning model (versus online- or classroom-only) and also validates what students find valuable about the classroom training: networking, class participation, discussions, instructor interaction, work feedback, and educational quality.

Going forward, for the coming year BOC is developing a more flexible curriculum format which includes a blended model that will allow for some parts of the class work to be completed online at the convenience of the student, while maintaining the classroom feature that students find so beneficial.

We would like to thank the respondents for their valuable input and congratulate the four winners of the raffle drawing: Lester Mason of Oakland Schools, Michigan; Joseph Boha of DSNY, New York; James Spurling of Josephine County Building Operations, Oregon; and Jeremy Rupp of Promega Corporation, Wisconsin.

## BOC Certification Renewal

To maintain BOC certification, graduates must accumulate continuing education (CE) hours each year following a full calendar year after their graduation. Level I renewal requires five CE hours each year and Level II requires ten. For renewal at both levels, a total of 15 hours is needed. Hours may be earned as follows:

- **Continued employment in building operations**..... *2 hours / year*
- **Continuing education in building operations**.....*Actual hours of classroom time*
- **Energy efficiency projects completed at your facility**..... *Up to 11 hours / year*
- **Membership in a building operations membership association**.....*1 hour / year*
- **Offices held in membership associations**..... *2 hours / year*
- **Awards received for efficient building operations** .....*2 hours / award*
- **BOC newsletter tech article quiz – (see page 3 for details)**.....*1 hour / passed quiz*
- **Completion of an energy consumption benchmark for the previous 12 month period using ENERGY STAR® Portfolio Manager or alternative energy accounting tool**.....*3 hours / year*
- **Enroll in a BOC webinar and complete its quiz *(see webinar announcement on first column this page)*** *1.5 hours / passed quiz*

You will be notified by mail when your certification is up for renewal (anniversary date appears on your wallet card). Once you have received a renewal notice, complete the application form and return it to your program administrator as instructed. Renewal fees are $55 for each level. If you would like to renew for both level I and level II, there is a combined rate of $85.

Please note that if your request for renewal is received after the March 31, 2013 deadline, there will be an additional fee of $25. Those received after June 30, 2013 will be charged an additional $50 late fee. Late renewal will require an extension form that can be found on the BOC web site (www.theBOC.info) under the "For Graduates" section.

## Find A BOC Training In Your Area

There are currently over 10,000 BOC graduates throughout the country and that number will continue to grow because the need for educated facilities operations & maintenance personnel is stronger than ever. BOC training is offered in twenty-six states and that number continues to grow as well. Graduates hail from Washington to Georgia, Maine to Hawaii, and represent companies in education, government, manufacturing, health care and beyond – just about every sector you can name.

### BOC Level I Certification

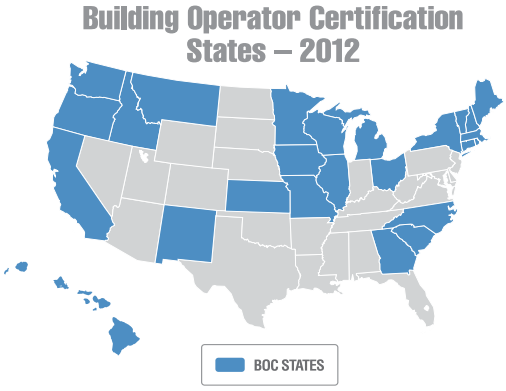
The Level I series comprises 74 hours of training and project work in building systems maintenance. In the fall, updated curriculum that has been developed will be available in select location and widely available in 2013. See page six, column three for details on the new course options.

### BOC Level II Certification

Level II has 61 hours of training and project work in equipment troubleshooting and maintenance. Courses include four core classes and two supplemental classes. The four core classes include: Preventive Maintenance & Troubleshooting Principles, Advanced Electrical Diagnostics, HVAC Troubleshooting & Maintenance, HVAC Controls and Optimization. See the website for supplemental class topics.

To find and register for a Level I or Level II training in your area, please visit the BOC website at www.theBOC.info.

Training is available from Maine to California – and now, even Hawaii!




## Continuing Education Opportunities for Certification Renewal Credit

Below you will find listings for the web sites of various national organizations that offer continuing education courses that are applicable to annual BOC certification renewal. Check out the Education, Professional Development and Events Calendars at these sites.

### APPA:
**The Association of Physical Plant Administrators**
www.appa.org

### BOC: Building Operator Certification
**Live and recorded seminars at**
www.theBOC.info/m-live-webinars.html

### BOMA:
**Building Owners & Managers Association**
www.boma.org/TrainingAndEducation/BEEP/

### BOMI:
**Building Owners & Managers Institute**
www.bomi-edu.org

### ENERGY STAR®:
**Live web conferences, pre-recorded trainings, self-guided presentations**
www.energystar.gov/index.cfm?c=business.bus_internet_presentations

### FEMP:
**Federal Energy Management Program Workshops & Conferences**
www.eere.energy.gov/

### GreenBuild:
**US Green Building Council**
www.usgbc.org

### HVACR Education:
**On-Line Learning for the HVACR Industry**
www.hvacreducation.net/

### IFMA:
**International Facility Management Association**
www.ifma.org

*The International Facility Management Association has several regional chapters, all of which can be accessed from the association's main web site address as above. Be sure to check out the site for the variety of learning options available, both online and via seminar.*

### PNNL:
**Pacific Northwest National Laboratory**
http://retuningtraining.labworks.org/training/lms/

*This interactive online class, Building Re-tuning, enables you to learn the initial steps involved in re-tuning a building controlled with a building automation system (BAS). Interactive exercises are included to provide you "hands-on" practice of the re-tuning process within a virtual building. Training takes about six hours to complete but does not have to be done in one sitting, and entitles you to six hours of CE credit.*

### Utility Energy Training Centers:
www.dsireusa.org

*Your local utilities may offer energy education events and their sites are sources for training opportunities as well. Regional industry associations also offer a number of options for further education. The link brings you to a database of state incentives for renewables and efficiencies.*

## Certification Renewal Reminder: Due March 31, 2013

For those BOC graduates whose certification expires January 1, 2013, the renewal process will begin in that first week of the year. During that first week of January 2013, NEEC will send renewal application notices via email and US mail to all eligible graduates. The deadline for 2013 renewal is March 31, 2013. You will need Continuing Education hours to renew your level of certification so don't wait too long! See page ten for details of renewal requirements for both Levels I and II.

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Partners in the BOC program include: Energy Training Foundation (South Africa), Gwinnett Technical College, Midwest Energy Efficiency Alliance, New York State Energy Research & Development Authority, North Carolina Community College System, Northwest Energy Education Institute, Northwest Energy Efficiency Council, Sacramento Municipal Utility District, Santa Fe Community College, South Carolina Community College System, University of Hawaii – Maui College, and Wisconsin Focus on Energy.

## Thank you to these sponsors of the Building Operator Certification across the country:

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**Editor and Contributing Writer:** *Christine Doonan* • **Graphic Design:** *ThomHarrisDesign.com*