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MAR/APR 2013

WATER MANAGEMENT & SUSTAINABILITY

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CONGRATULATIONS ON THE RETIREMENT OF AN APPA PRESIDENT AND A LONGTIME APPA STAFFER

Harrod, l, with Bill Elvey

After 22 years as director of physical plant at the University of Wisconsin Madison, **John Harrod** recently retired to start a new chapter in his life—to do whatever he wants, whenever he wants. APPA's 2000-01 President served APPA and the Midwest region for many years throughout his career.

Choi

John spent 18 years at Iowa State University, first as a landscape designer and eventually as associate director of physical plant operations. He then became director of physical plant at Northern Illinois University, where he served for four years before heading to UW Madison.

During his year as APPA President, John's theme and message to the membership emphasized the "personal touch" that is important and most effective between member to member, and between APPA leadership and the membership at large.

"There's a real interest and need for members to feel that they are in touch with those who guide and direct the organization, so the personal touch is critical," John said in an interview with *Facilities Manager* at the start of his presidency.

In addition to many other accolades during his time in APPA and MAPPA, John received APPA's 1997 President's Award and the 1998 Meritorious Service Award.

And as of March 1, **Chong-Hie Choi**, APPA's chief financial officer for more than 26 years, has retired. Her tenure with APPA was characterized by her spirit of professionalism—and impeccable financial management. Among her many critical duties for the association, Chong-Hie worked with the APPA Board of Directors and served as the APPA staff liaison to the Pacific Coast region. She also was the recipient of the 2002 APPA President's Award.

"Chong-Hie has been an invaluable member of the APPA staff," said Lander Medlin, APPA's executive vice president. "Her extreme dedication and loyal commitment to APPA cuts two ways. First, she is a true professional in the field of accounting and finance. She logged in 26 clean audits over that period of time—a feat that I don't believe can be beat! Second, she has been a consummate supporter of our members in the field of educational facilities management. She has always been available and responsive when any need arose. She will be sorely missed by both the staff and the facilities management community."

Join APPA in wishing both John Harrod and Chong-Hie a very happy retirement.

Coming in May/June 2013

- Leadership Best Practices
- Mentoring to Pay It Forward
- FM's Role in Organizational Sustainability

FACILITIES manager

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About APPA

APPA promotes leadership in educational facilities for professionals seeking to build their careers, transform their institutions, and elevate the value and recognition of facilities in education. APPA provides members the opportunity to explore trends, issues, and best practices in educational facilities through research, publications, professional development, and credentialing. Formerly the Association of Physical Plant Administrators, APPA is the association of choice for 5,200 educational facilities professionals at more than 1,500 learning institutions throughout the United States, Canada, and abroad. For more information, visit us at *www.appa.org*.

APPA 2013

Celebrating Innovation & Preparing for the Next Horizon

Minneapolis, Minnesota

August 2-4, 2013

APPA 2013 is the premier event for the facilities professionals offering the ultimate networking and learning experience for facilities officers, directors, and management personnel at every level, and from around the world.

At this event, we will explore the latest trends, challenges, and solutions facing facilities organizations within colleges and universities, K-12 private academies and public school systems, libraries, museums, and other institutions of learning.

Enjoy over 40 conference sessions with diverse perspectives from today's leading facilities officers, campus administrators, college presidents, students, and education experts who are shaping and influencing the direction of the education and the campus facilities environment.

For the latest on APPA 2013, visit us at **www.appa.org/training/APPA2013/index.cfm**.

NEW AT APPA 2013

This year we are offering a brand new program which will be known as the Emerging Professionals Summit. As the face of facilities is rapidly changing, we understand at APPA the critical need to meet these challenges head on to support all of our levels of membership. The Emerging Professionals Summit will deliver programming that will prepare the next generation of facilities professionals with the resources they need to meet these challenges head on! For more information on this exciting new program, visit us at **www.appa.org/training/APPA2013/index.cfm**.

APPA
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Interested in exhibiting?

Visit us today at **www.appa.org/training/APPA2013/exhibitorssponsorship.cfm** to see why APPA's 2013 Hall of Resources is where you need to be! For additional assistance contact Suzanne Healy at **suzanne@appa.org** or Corey Newman at **corey@appa.org**.

Industry News & Events

facilities digest

By Anita Dosik

CANDIDATES FOR APPA OFFICE 2013-2014

The APPA Board of Directors is pleased to present the selected slate of officers for the 2013-2014 elections:

PRESIDENT-ELECT:

- Randolph Hare, Washington and Lee University
- John Ott, Ohio State University/OARDC

VICE PRESIDENT FOR PROFESSIONAL DEVELOPMENT:*

- Chuck Scott, Illinois State University

Running unopposed

[* There will be a special election for this office for a two-year term, not the customary three-year term. This individual will complete the remaining term vacated by Robyn Pierce.]

Voting begins in March 2013 and is open to primary/institutional representatives. Those eligible to vote will be able to do so online or via paper ballot. The online ballot will include a link to a video statement from each candidate. The ballots close on **April 16**.

Please note that the primary/institutional representative will have the option of having an associate member vote on their behalf via proxy (only one vote will be accepted from each institution). The associate member with proxy rights has been listed on the dues invoice.

To learn more about the candidates and to vote, go to *www.appa.org/vote*.

If you have any questions, contact Anita Dosik at *anita@appa.org* or 703-542-3837.

APPA MEMBERSHIP RENEWAL NOTICES SENT – PAY BY MAIL OR ONLINE!

The 2013-14 APPA membership year begins April 1, 2013 and runs through March 31, 2014.

APPA accepts dues payments by major credit card through the APPA website at *www.appa.org* via myAPPA, your personalized APPA website account. **Note that the APPA Board of Directors has now included access to the BOK (APPA's digital Body of Knowledge) as an ongoing institutional member benefit.**

Institutional, International, and Affiliate member organizations should also take note that their membership renewal invoices will identify the names of individuals authorized to vote in APPA's upcoming 2013-2014 officer elections.

UNIVERSITY OF WASHINGTON BOTHELL HOSTS SUCCESSFUL DRIVE-IN WORKSHOP; WASHINGTON STATE CHAPTER OF APPA IS LAUNCHED!

APPA is pleased to announce the launch of the Washington State APPA Chapter (WAPPA) on December 12, 2012. Formation of the WAPPA chapter was announced in conjunction with a recent APPA Drive-In Workshop held at the University of Washington Bothell. The APPA Drive-In program was made possible through the support of ESC Automation and McKinstry.

Forty-eight educational facilities professionals from more than 20 APPA member institutions, business partners, and affiliates attended the workshop. Presentations on energy management dashboards and the APPA Facilities Performance Indicators program were included in the workshop program and were presented by Eric Shimmin (ESC Automation) and Duane Hickling (Hickling & Associates).

"We are thrilled to see WAPPA become a reality," said PCAPPA Past President Tony Guerrero, who serves as the assistant vice chancellor for facilities services at the University of Washington Bothell. "Since we held our first APPA Drive-In back in 2010 at Seattle University, there has been a strong desire to have regular meetings for professional development and networking opportunities."

Founding members of the new WAPPA chapter are as follows:

Tony Guerrero – University of Washington Bothell

Steve Szablya – Seattle University

Chuck Davis – Seattle Central Community College

Melinda Nelson – ESC Automation | Delta Controls

"We appreciate all the help received from APPA, and also the support and advice of J.B. Messer, a founder of the Oklahoma State Chapter and former CAPPA president," said Melinda Nelson, PCAPPA's business partner liaison.

For a listing of APPA's chapters and links to chapter websites, visit *http://appa.org/regions/chapters.cfm*.

EVENTS

APPA EVENTS

Aug 1, 2013 SFO Summit, *Minneapolis, MN*

Aug 1, 2013 EP Summit, *Minneapolis, MN*

Aug 2-4, 2013 APPA 2013: Annual Conference & Exhibition, *Minneapolis, MN*

Sep 8-12, 2013 APPA U: Institute for Facilities Management and Leadership Academy, *Fort Lauderdale, FL*

APPA REGIONAL AND CHAPTER EVENTS

Mar 19, 2013 VAPPA 2013 Conference, *Richmond, VA*

Apr 3-5, 2013 Arkansas Association of Facility Administrators Spring 2013 Meeting, *Heber Springs, AR*

Apr 3-5, 2013 NJAPPA Spring Conference, *Galloway Township, NJ*

Apr 5, 2013 OAPPA 2013 Annual Conference, *Edmond, OK*

Apr 13-16, 2013 TAPPA 2013 Conference, *South Padre Island, TX*

May 13-14, 2013 2013 NCAPPA Conference, *Greensboro, NC*

May 14-15, 2013 TNAPPA 2013 Conference, *Martin, TN*

May 25-29, 2013 GAPPA 2013 Annual Conference, *Jekyll Island, GA*

RELATED EVENTS

Mar 25-27, 2013 AUDE Conference 2013, *Warwick, United Kingdom*

Apr 15-16, 2013 Smart and Sustainable Campuses Conference, *Bethesda, MD*

Apr 20-24, 2013 SchoolDude University 2013, *Myrtle Beach, SC*

May 6, 2013 Project Management - An Owner's Perspective, *Atlanta, GA*

May 8-10, 2013 Hot Trends, Cool Ideas: COAA Spring Leadership Conference, *Atlanta, GA*

Jun 9-12, 2013 Building, Bridging, and Blazing Pathways for Women and Leadership, *Pacific Grove, CA*

For more information or to submit your organization's event, visit *www.appa.org/calendar.*

2011-2012 FPI REPORT PUBLISHED

The 2011-12 Facilities Performance Indicators Report is available at no cost to all APPA members who participated in the FPI survey, and for purchase through the APPA website for all others. The newly enhanced report is based on an extensive data collection effort for the 2011-12 fiscal year.

Participants of the 2011-12 Web-based FPI report will be able to view data from previous years, as well as all other report features. Accessing the report allows your institution to identify up to five users who can view your report. In addition, you'll have access to the Executive Level Dashboards as well as the Detailed Date Reports and Excel Survey Data files.

Costs for access to the Web-based FPI Report are:

- APPA Member Participant – FREE
- APPA Member Non-Participant - $500
- Nonmember Participant - $895
- Nonmember Non-Participant - $1,000

APPA also hosted new ESAT (Energy and Sustainability Assessment Tool) webinars, which will help you discover how to input data into this powerful tool as well as how to access various reports and results. Visit *http://www.appa.org/research/fpi/webinar.cfm* to view a complete listing of archived FPI and ESAT webinars.

You can order the FPI report at *http://appa.org/research/FPI/index.cfm*. For more information, contact Christina Hills, director of credentialing and benchmarking, at *christina@appa.org*.

facilities digest

CONGRATULATIONS TO APPA'S RECENT CEFP AND EFP RECIPIENTS

Join APPA in congratulating the following members who have demonstrated their ability to lead by obtaining credentials through the APPA certification program. Between October 1, 2012 and January 4, 2013, 23 individuals advanced their careers by obtaining APPA's Certified Educational Facilities Professional (CEFP) credential, and 17 earned Educational Facilities Professional (EFP) certification:

CEFP
Certified Educational Facilities Professional

CEFP RECIPIENTS

Joseph Asperger, Kettering University
Brandon Baswell, Michigan State University
Warren Bowen, NewPath Strategy Consultants
Michael Colburn, Wayne State University
Rafael de Luna, University of Pennsylvania
Steve Esch, Central Michigan University
Joel Foos, University of Michigan/Ann Arbor
Mark Frever, Albion College
George Germain, Montcalm Community College
Ryan Giorio, Oakland University
Michael Gramza, University of Michigan/Ann Arbor
Ted Johnson, College of Lake County
Siraj Khan, Oakland University
Tim Korn, Muhlenberg College
Amanda Krok, Mott Community College
John Latoski, Central Michigan University
Paul Manstrom, Kalamazoo College
Gerald Nyland, Muskegon Community College
John Ott, Ohio State University/Agricultural Research Development Center
Don Pasda, Lehigh University
Evelyn Schenk, Kirtland Community College
Jim Vandokkumburg, Grand Rapids Community College
Rick Waligora, Philadelphia University

EFP
Educational Facilities Professional

EFP RECIPIENTS

Dawn Barnett, Cabrini College
John Birkle, University of Michigan/Ann Arbor
Samantha Brandt, University of Michigan/Ann Arbor
Robin Colling, Idaho State University
Tom Davis, University of New Mexico
Megan Davitt, University of Scranton
Felix Deleon, Massachusetts Institute of Technology
James Eyerly, Chesterfield County Public Schools
John Glass, Wheaton College/Illinois
Matt Gulbicki, Philadelphia University
Joel Kiss, Saginaw Valley State University
Dennis Kretin, University of Michigan/Ann Arbor
Patrick Mucker, Texas Christian University
Paul Perry, Northwestern Michigan College
Karl Pettit, Philadelphia University
Tim Ratliff, Winchester Public Schools
Keith Webb, Newport News Public Schools

THE APPA BUSINESS PARTNER WHITEPAPER SERIES

The new year marked the beginning of a new feature in APPA's online newsletter, *Inside APPA*—the APPA Business Partner Whitepaper Series. Starting in January 2013, *Inside APPA* includes case studies, research results, product development information, or other articles from APPA Business Partner members. One Business Partner firm will be highlighted per issue; the first BPs to be highlighted included Acuity Brands, Hoffman Architects, C&S Companies, and the Gordian Group.

CORRECTION

The January/February 2013 issue of *Facilities Manager* featured the incorrect 2012 regional report for RMA. The correct report appears on page 9. In addition, the corrected online files can be viewed at *www.appa.org/facilitiesmanager*. Our apologies for the error.

RMA Rocky Mountain Region

Pat Allen
RMA Conference Planning Committee Member
Casper College

It was Wyoming's honor to host this year's Rocky Mountain Regional conference. Sheridan was picked for its historic cowboy appeal and rugged beauty matching the conference theme "Cowboy Up!" Managing In Difficult Times. With quaint Trolley Tours and an abundance of western history it was easy to glean inspiration from our heritage and take hold of lessons learned in hard times.

Sessions were full, as there were nearly 250 attendees, and beneficial given all the feedback received. The Keynote speakers were Walt Stasinski and Don Mann. Walt spoke about fun in the workplace and Don Mann a Navy Seal and Trainer for Seal Team Six challenged all to set higher goals.

Entertainment was memorable starting with world class fishing on The Big Horn River and Golf on the amazing Powder Horn golf course at the base of the mountains. The welcome reception held at the historic 100 year old Mint Bar was in fact historical. The Second night was hosted by the oldest working dude ranch in the United States, Eaton's Ranch. Wyoming steaks and the Two Step set the pace for the last evening. The" Blues Brothers" who were flown in from Chicago for a fabulous show and a full night of dancing.

Business was conducted by 2012 President Vyron Lynch and Master of Ceremonies was Mike Sawyer from the host school Casper College.

2012 president Viron Lynch (left) handing the gavel to 2013 president Chris Kopach.

Host Mike Sawyer (middle) with The Blues Brothers, Elwood and Jake.

THE 2012-2013 RMA OFFICERS:

President – **Chris Kopach**, University of Arizona
President-Elect – **Brian Johnson**, University of Idaho
Senior APPA Representative – **Dave Button**, University of Regina
Junior APPA Representative – **Viron Lynch**, Weber State University
Secretary – **Chris Eagan**, University of Lethbridge
Treasurer – **Steve Hoskins**, University of Utah
APPA Liaison – **E. Lander Medlin**

To view RMA's website and find a complete listing of the board of directors, please go to *http://www.rma.appa.org/*.

The 100-Year Initiative — Movement to an Integrated Institutional Membership

By E. Lander Medlin

Last July 2012, the APPA Board of Directors approved the APPA/Regional Relationship Task Force Phase 2 (RRTF) report, recommendations, and plan of action. The goals for the RRTF were overarching and far-reaching:

- Promote/create synergy between International APPA, the regions, and chapters
- Keep International APPA and its regions/chapters as the "associations of choice" for all educational facilities professionals
- Discuss structure that encourages participation and provides support for all membership categories
- Maintain and further enhance opportunities for relationships with business partners
- Align the regional leadership and international APPA activities to promote leadership, succession planning, and the value of ongoing efforts of the APPA staff and volunteer leaders

Phase 2 work of the RRTF accomplished the following set of targeted deliverables:

- Provided "actionable" guidelines for the roles and responsibilities for International APPA, the regions, and chapters
- Prepared a statement of impacts on International APPA, the regions, and chapters' membership dues (to include business partners and other stakeholders)
- Documented the above with an Implementation Action Plan that is an integral part of APPA's Strategic Plan

The body of work accomplished over the past two years set the stage for some exciting new opportunities for changes in membership for International APPA and the regions. In fact, the RRTF Phase 2 team's recommendations suggested there were two remaining tasks that needed much more work, time, and attention and would require a multi-year implementation plan.

> ALL INDIVIDUALS AT THE INSTITUTION WILL BE ABLE TO TAKE ADVANTAGE OF INTERNATIONAL APPA AND REGIONAL ENGAGEMENT.

Those two tasks were: 1) Move to an "integrated Institutional Membership" dues model;,and 2) Establish a Business Partner engagement group. With respect to Task # 2, the regional presidents identified a business partner representative from their respective region to work on this engagement group. Bill Nelson (Chair & business partner from GLHN) and David Gray (APPA's Immediate Past President) have begun this work in earnest. Their work is still in progress and proving to be an important feedback mechanism for business partners. A final report is due to the APPA Board this July 2014.

With respect to Task # 1, the intent was for International APPA and the regions to focus on the development of an "integrated institutional membership model" (i.e., they emphasized the importance of eventual movement by all of APPA to an institution-based model). In alignment with this long-term move to an institution-based dues model, APPA is pleased to announce that APPA's BOK (Body of Knowledge—a searchable, online, digital database) is now included in your membership dues. That means that everyone at your institution will have access to this powerful tool upon payment of your 2013 APPA dues. No more subscription fee! Instead, everyone at your institution can gain access to the BOK, with its best practices, recommendations, resources, and professional guidance to aid you in supporting the mission and vision of your educational institution—simply by being an APPA institutional, affiliate, or business partner organization member.

As we slowly move to this integrated institutional membership model over the next two to four years, all individuals at the institution will be able to take advantage of International APPA and regional engagement. This should significantly reduce confusion over who is a member of International APPA and the region at each institution or business partner organization,

and who can take advantage of all the benefits offered across both entities.

Each region has been provided detailed institutional membership dues data and a suggested plan of action for its regional board to consider. As a result, there has been general agreement and alignment to make this movement over time and begin taking the next series of steps toward its implementation. Implementation will occur over the course of the next three membership billing cycles. Each region is considering how to incorporate this type of change in the membership model as a formal report and/or vote at its respective business meeting. Be on the lookout for these important meetings and discussions.

There are a series of decisions necessary in order to move to an integrated institutional membership model and is part of a three-step process requiring three to four years for implementation:

Step 1/ Years 1-2: Move regions to an institutional dues billing utilizing APPA's Institutional Dues Matrix. Several regions (ERAPPA & MAPPA) already utilize APPA's institutional dues matrix and bill a "percentage" of APPA's dues. The other regions charge dues based on an individual membership basis. Together, we are exploring how we might move to a percentage basis overall.

Step 2/ Years 2-3: Incorporate additional "paid" associate members into the overall institutional bill. The intention is to allow the institution as many associate members as they would like for one membership price. Each region would do the same, thereby also allowing for as many individuals to be part of the region as the institution would like.

Step 3/ Years 3-4: All new institutions would automatically be assessed membership in both APPA and the region. We plan to "grandfather" any institutions that are presently members of either APPA only or the region only, but would move to an "all-in-one" membership model for all newly recruited institutions.

Why change? Why now? The benefits of all institution staff to network with like-minded facilities professionals and to be exposed to guidelines, standards, and best practices availed at the International APPA, region, and chapter levels are critical and will produce more effective and successful professionals and facilities organizations thatmeet the mission of the education enterprise. Therefore, streamlining our membership process is the desired goal over the long term. We will keep you updated on this exciting new endeavor.

Lander Medlin is APPA's executive vice president and can be reached at *lander@appa.org*.

Bringing Home the Bacon

By Jeri Ripley King

Remember the Kevin Bacon game? Loosely based on the theory that any two people on Earth are about six acquaintance links apart, the basis for the Bacon game is that any actor may be linked to Kevin Bacon by having worked in a movie with him or having a link to someone who has. You get the gist of this; movie actors are closely connected. But, according to the six degrees of separation theory, so is everyone else. We don't have to look far in educational facilities departments to start noticing the connections within and among our departments, institutions, and beyond.

APPA facilitates our connectedness by providing opportunities for us to share the "who, what, how, and why" of our work. We meet people from other institutions and business partner firms. We learn by talking with each other, attending educational sessions at conferences, reading, and researching topics of interest. By exploring new ideas, we share what worked for us and what didn't.

Through this, we hone our connections. The more connected we are, the more we know about educational facilities management. The more we can tap additional information quickly when we need it, the better we can serve our institutions.

OUR BODY OF KNOWLEDGE

APPA members have been collecting, sharing, and refining our knowledge about educational facilities for nearly 100 years. We have amassed a vast amount of information that includes books and publications, including the *Facilities Manager* magazine and Thought Leaders Series, Center for Facilities Research projects, Facilities Performance Indicators surveys and reports, the Body of Knowledge (BOK), and *Inside APPA* e-newsletter.

In recent years, much of our written knowledge has been made available via APPA's website. Our searchable database now offers more than 3,300 articles and case studies. We are adding about 100 projects of this type per year. Sixteen peer-reviewed research projects have been completed since the launch of the Center for Facilities Research (CFaR) in 2002. At this time, we are averaging about two peer-reviewed research projects per year. In addition, the online Body of Knowledge that replaced the four-volume *Facilities Management* manual several years ago, continues to be expanded and updated.

BOK
Body of Knowledge

Keeping a watchful eye on our written knowledge, videos, podcasts, and recorded webinars is APPA's Information and Research Committee, a group of about a dozen members that includes regional representatives, at-large committee members, and APPA staff. They play a key role in fostering the growth and dissemination of APPA's collective body of knowledge.

With much of our expanding written knowledge available on the APPA website, the Information and Research Committee has wrestled with how best to organize that information for easy access. Last year, the installation of an improved search engine started helping users find things more quickly. More improvements of that ilk are planned. However, an even more fundamental change is currently underway.

The Information and Research Committee and APPA staff are also working to connecting our online BOK to other areas of information in the APPA website. The BOK is a reference for information in APPA's four core areas: general administration and management; operations and maintenance; energy, utilities, and environmental stewardship; and planning, design, and construction. To date, the BOK has been a separate entity from the other amassed articles, case studies, research projects, and resources APPA makes available to its members. Now, it will enjoy a closer connection. The first steps already have been taken; simple links have been established to allow it to serve as a portal, sort of a one-stop shop, for access to the BOK chapters, Facilities Performance Indicators survey and report, the *Facilities Manager* magazine, and the Center for Facilities Research.

Imagine the synergies that can be created as we increase the connectivity of our information database. This means

that, in the future, when you are trying to find out about best practices, trends, or elements within a specific topic area, you will be able to go to APPA's Body of Knowledge for information and also gain access to the various parts of APPA's website that may also have additional information available on the topic.

It also means that it will become easier for you to identify a topic that has not yet been covered. It may be a topic that you want to explore and then share what you learn, a case study about what worked or didn't, or a topic that you recommend for consideration by the Center for Facilities Research or for *Facilities Manager* that will engage others in the quest for knowledge.

CONNECTING THE DOTS

As exciting as it is to be on the leading edge of this drive for increasing our knowledge and expanding the connectivity of our information and research, there is one more step underway that is extremely important. With the current dues cycle for 2013-14, the online Body of Knowledge will become a member benefit.

In the past, an annual subscription to the BOK made it possible for all within an institution to use this source of information. One subscription allowed all within a member institution access. However, if the dues payer did not opt to purchase a subscription, it meant that everyone within that member institution would not have access, thereby excluding connections by those in the facilities department, administrators, faculty, and students who might someday choose to go into the facilities field.

Beginning with the new fiscal year effective April 1, this valuable source of educational facilities information will be available to everyone at a member institution. It can be used by students, faculty, and staff to expand their connections, elevate their understanding, and grow the profession. There will continue to be an annual subscription fee for nonmember institutions and organizations.

APPA connects each of us, and our knowledge, through networking, information sharing, and celebration of achievement. It is within this context that our participation matters the most. In effect, APPA reduces our degrees of separation to enhance our knowledge in ways that will enable our success as educational facilities professionals.

Jeri King is assistant to the AVP at the University of Iowa, Iowa City, and she serves as APPA's Vice President for Information and Research. She can be reached at *jeri-king@uiowa.edu*.

Mentorship

By Thomas Lee

One of the most important and meaningful things to do in today's world is mentorship—to become a mentor to someone. Becoming a mentor could also mean working with several people, or a group.

WHAT IS MENTORSHIP?

The Merriam-Webster Dictionary defines a mentor as "a trusted counselor or guide." True mentoring is more than just answering occasional questions or providing help. It is about an ongoing relationship of learning, dialogue, and challenge. Mentoring is a process that always involves communication and is relationship based.

Another definition says mentoring is a process for the informal transmission of knowledge and the psychosocial support perceived by the recipient as relevant to work, career, or professional development. Mentoring entails informal communication, usually face-to-face and during a sustained period of time, between a person who is perceived to have greater relevant knowledge, wisdom, or experience, and a person who is perceived to have less.

Now, both of those are excellent, intelligent definitions to what mentoring actually is. But I want you to think about this: Why do you know and remember some things the way you do? Could it be because someone took time to teach you? Isn't being a mentor, and mentoring someone, somewhat like being a teacher, too?

THE LID LIFTER

At the APPA 2012 conference in Denver, Colorado, Joseph Han and Cheryl Hanson, both from Idaho State University, presented a class called Unleash the Potential in Others. They used the analogy of a glass jar with a lid on it and you having the opportunity to become a lid lifter. What is a lid lifter? It is a person who creates an environment to help discover and unleash potential in others. It is becoming a mentor.

Do you consider yourself to be a mentor to someone? Do you think it's possible? Think back to someone who has been a mentor to you. Someone (and very possibly, more than one) during the course of your life took time to show you how to become the person you are today. Even if only in small ways, your work ethic and professional personality were influenced by someone who felt is was important to advise and teach you what they found to be important.

What did they do to help you or leave the impression on you that you have? I have had a few mentors in my life, but one sticks out more than the others. He was an assistant fire chief when I was a 21-year-old-rookie firefighter, and why he took so much time to become the friend he has become, I will never know. But I am forever grateful that he did. He served as a role model who offered acceptance, confirmation, protection, and his friendship. He listened, observed, counseled, coached, and was always challenging me to be a better person. He gave me a chance to succeed, believed in me and what I was capable of doing, and always had (and still does) a word of encouragement. He has an outlook on life that is unique from any other person I have ever met. I can only hope to be just like that to someone else.

You too can be a mentor to someone else. We need to always be on the lookout for opportunities to mentor someone when we can. As a professional, you have considerable knowledge in your field that you can share with others. Being a mentor involves leading with integrity, self awareness, and a commitment to looking honestly at yourself. When we acknowledge others as people and build a rapport with them, it can become a great source of enjoyment.

WHAT IS EFFECTIVE MENTORSHIP?

Effect mentors assume a position of

MENTORING FOCUSES ON SKILLS AND PERSONAL QUALITIES EFFECTIVE FOR CAREER SUCCESS.

respect and patience, guide rather than tell, and provide challenges that stretch the capacity of the mentee. They do this by listening, reflecting on experiences, asking questions, encouraging a sense of ownership, gently challenging, and affirming the experience of the mentee.

Effective mentoring occurs in an environment of confidentiality, in both parties can be candid and self-revealing to each other without fearing for the publication of the content of their conversations. It is absent of summary judgments and evaluations about personality and character. Instead, mentoring focuses on skills and personal qualities effective for career success.

WHAT ARE THE BENEFITS OF BEING A MENTOR?

They can include satisfaction and fulfillment from seeing someone advance, renewal of interest in and commitment to one's own career, recognition of one's own professional skills by the mentee, increased satisfaction in one's own job or position, and recognition from peers and administrators for service.

WHAT ARE THE ADVANTAGES OF BEING MENTORED?

They can be greater career and job satisfaction, greater sense of efficacy in one's professional skills, and more predictable career advancement. In a college or university setting it can be reduced faculty turnover, increased sensitivity to issues of gender, culture, and diversity, more systematic socialization to campus culture, and greater loyalty to the institutional mission.

Still think you can't do it, can't be a mentor to someone? You can! If you could only sense how important you are to the lives of those you meet—how important you can be to people you don't even know. There is something of yourself that you can leave at every meeting with another person. There is no greater joy—or greater reward—than to make a fundamental difference in someone's life.

Recognize yourself. You have the potential to help others. Take responsibility. Show others what they can do and what they can become. Be open to criticism and questions. Don't be afraid to support someone. Have the want, the need, and the desire to help someone.

Become an authentic leader. Authentic leaders are genuine people who are true to themselves and to what they believe in. They engender trust and develop genuine connections with others. Because people trust them, they are able to motivate them to high levels of performance. Rather than letting the expectations of others guide them, they are prepared to be their own person and go their own way. As they develop as authentic leaders, they are more concerned about serving others than they are about their own success or recognition.

WHAT CAN A GOOD MENTOR DO?

Believe in them—give them confidence
Encourage them—give them hope
Share with them—give them resources
Trust in them—give them the opportunity.

Someone may see what they are capable of, but few people realize their full potential. What is the difference? A mentor!

Consider this: You might be the most important person someone knows.

Tom Lee is supervisor ground fleet & support services at Southeast Missouri State University, Cape Girardeau, MO. He can be reached at *tlee@semo.edu.*

Comparative Thinking

Better Comparisons for Better Decision Making

By Joe Whitefield

Recently I was asked to speak to a class of university freshmen on various aspects of facilities operations on campus. As part of that presentation, I was also asked to share the best advice I had ever been given. As I sorted through a significant list, I settled on a basic statement that has changed my approach to addressing the many professional and personal challenges of daily life:

"*There are no solutions, only trade-offs.*"

I shared how this view has led me to become more thoughtful when making decisions, particularly decisions that have major consequences or affect other people.

At its core, making decisions has always been an exercise in comparing alternatives and choosing the better or best alternative for the situation after considering the trade-offs of costs and benefits. Good decisions are the result of teasing out the advantages from an evaluation of comparable alternatives. Conversely, poor decisions usually result when the trade-offs are not considered or the process is short-changed in some manner.

Fortunately, comparative thinking comes naturally to most people. We compare things all of the time. These comparisons serve as the basis for making judgments (good/bad, better/worse, etc.), and these judgments are the basis for making decisions. This scenario of comparison plays out numerous times a day. We compare prices of things, ourselves to others, and others to others. In fact, it can be quite difficult not to make comparisons. Unfortunately, the intuition to make comparisons is not always coupled with the skill of making solid comparisons (apples to apples) and accurate judgments.

C Completion
O Organization
I Innovation
N Being Nice

Most facilities managers I know are both intuitive and skilled when it comes to decision-making in the workplace. That is a good thing since numerous decisions are required every day in the areas of operations, maintenance, capital projects, energy/utilities, and sustainability. Still, there are a myriad of issues that can impair the decision-making process.

ESTABLISHING INEFFECTIVE METRICS OR BASELINES

Since baselines serve as the primary standard for evaluating alternatives, it is important to begin with the correct baseline. Take energy savings projects for example. Retrofit projects and initiatives have the advantage of

THE INTUITION TO MAKE COMPARISONS IS NOT ALWAYS COUPLED WITH THE SKILL OF MAKING SOLID COMPARISONS AND ACCURATE JUDGMENTS.

historical performance that can serve as the primary baseline. Energy savings alternatives can be evaluated against one another using a payback calculation when compared to the energy performance of the previous system.

Evaluating energy savings alternatives for a new building, however, is more challenging because there is no existing baseline with which to begin. A predicted baseline of performance must be determined. If this baseline is not adequately determined, and readily understood, faulty judgments of the alternatives can result and poor decisions made. We have all seen projects that did not live up to their predicted performance because the evaluation process overstated the benefits or understated the costs. The process starts with establishing a proper baseline. The right baseline will lead to better comparisons and better decisions.

COMPARING BENEFITS ONLY

Evaluating the trade-offs of comparable alternatives is a total value proposition. That means both the benefits and costs have to be considered for a true evaluation and accurate comparison. Facility managers are well aware of the issues with the total cost of ownership. The lesson from history is that the total costs, and not just the initial cost, should be identified and evaluated, along with the predicted benefits, as early as possible in the decision process.

More and more I hear of projects being evaluated without adequate consideration of all current and future costs. Future costs are speculative and sometimes difficult to estimate because of a long list of operational and market variables. Marketing efforts focus on benefits. However, a true evaluation must do more than imitate marketing; it must force the issue of cost identification and present a realistic picture of the total net value of the available options.

This is the hard part. No one likes the process of identifying and evaluating costs. Still, we all know stories of projects that failed to meet expectations as a result of insufficient understanding or evaluation of the total costs.

Facilities managers everywhere want the benefits of attractive campuses and high performing facilities that are safe, clean, and functional. And while there are many similarities from campus to campus, there are also more differences that make facilities management unique. Campus mission, culture, traditions, geography, personnel, and fiscal resources are just a few of the differences. That is what makes "solutions thinking" and a simple adoption project process ineffective—they tend to focus on a benefits-only, homogenous approach.

They do not adequately consider the unique elements involved, or the total costs required for a true comparison of alternatives the way "trade-off thinking" requires.

Better comparisons lead to better judgments, which lead to better decisions and better projects. It is my contention that trade-off thinking will generate better solutions than solution thinking. And better is, well, better.

Joe Whitefield is executive director of facilities services at Middle Tennessee University, Murfreesboro, TN. He can be reached at *joe.whitefield@mtsu.edu*.

Above: A thermal green roof at American University. *Below left:* Geothermal digging at Ball State University. *Below right:* The pond at Ball State.

Water, water everywhere—

managing and conserving water resources is a major factor at campuses worldwide. Doing so is a challenge, since water is one of the most-used and ubiquitous resources in any environment. Water is often taken for granted and not measured by the people who use it the most, yet it might have the greatest potential for helping facilities managers and sustainability coordinators improve usage and conservation.

Campus facilities professionals are focusing on water use as part of larger concerns over sustainability, invoking innovation, and working with other departments, faculty, and students to make the best use of this essential natural resource.

INNOVATION & COLLABORATION ARE KEYS TO CAMPUS WATER MANAGEMENT

By Ruth E. Thaler-Carter

ASSESSING USE, IDENTIFYING CONCERNS

Knowing how much water is being used where, when, and how often is critical to management, conservation, and reuse.

"Since we're in the arid southwest and have had drought issues, a lot of time we're irrigating for the trees," said Carol Dollard, P.E., LEED AP, energy engineer at **Colorado State University** (CSU) in Fort Collins. "In the 1960s, we switched from treated to raw water, which saves not so much the amount of water we use but the treatment costs. We implemented a project about five years ago when we retrofitted and saved about 15 million gallons of water a year from 42 devices. The retrofit paid for itself in the first year."

That is one of the factors in CSU receiving the second-highest STARS rating of any university in the U.S., Dollard noted. "We're very proud." *[Ed. note: STARS is the Sustainability Tracking, Assessment & Rating System developed by the Association for the Advancement of Sustainability in Higher Education.]*

At **American University** in Washington, D.C., "One of the bigger issues is stormwater, because we are in the Chesapeake Bay area—we have too much water and pollution runoff," said Chris O'Brien, AU's director of sustainability. Since local government has tightened up its stormwater rules and charges institutions for using it, "We have done a lot to mitigate—we've put a lot of energy into green roofs; we have 11 on campus. We have a number of rain gardens and bioretention ponds, some permeable paving, a double cistern in one building to flush toilets, and a building designed to have near-zero stormwater use."

One parking pad for utility vehicles has spacers between the bricks so water can soak into the ground. The school is working on replacing surface parking: "Slowly but surely, we're removing impervious areas."

AU, one of five institutions winning APPA's first Sustainability Award in 2012, is working to certify 25 existing buildings in LEED. "We are one of only three schools in the world to

Left: Garden area near Evergreen State College's Longhouse Center. *Center:* Emory University's greywater tanks. *Right:* AU's sustainability team.

Greywater research is conducted at Aspen Hall, Colorado State University.

attempt LEED Volume," O'Brien said. The focus is on establishing a baseline to compare to a performance-based metric as a benchmark for aerators in faucets, low-flow showerheads and toilets, and other areas of potential resource reduction and conservation.

Another 2012 recipient of APPA's Sustainability Award, the **University of Prince Edward Island**, of Charlottetown, PEI, Canada, is monitoring water use and developing its own methodologies based on the BOMA (Building Owners and Managers Association) Best guidelines, since "we don't have the Green Globes standards," according to David Taylor, manager of environmental services. "We're looking for policies and procedures for tracking usage. It's a challenge because we do a lot of aquatics research," making extensive water use essential.

Even with that research aspect, "we don't have enough use" to justify sophisticated metering of water. "Our utility budget is about $5 million and water is only 4 percent of that, so it isn't seen as a need when saving money," Taylor explained. "We still care about conservation, though, so we partner with other departments when they're looking at retrofits. We can show faster paybacks (with conservation-oriented equipment)—four versus ten years. The measures don't necessarily sell themselves; it's based on economics."

The assessment process provides "a snapshot for comparing usage among buildings," Taylor said, which can lead to an important find. "We engaged our engineering students to assess water usage and do an analysis, and they found that one residence building was using three times more water than the others," he recalled. "We found a massive underground leak on our side of the water meter. A sump pump was running, but just sending water back into the ground. It was eye-opening for us as something to monitor. Now we assess water use every summer with students." That has double advantages: It gives facilities the necessary usage monitoring and picture, and "we have students engaged in learning. Students love to do that."

The University of PEI is among the campuses that are starting to find ways to discourage wasteful use of water bottles. "We haven't been able to adopt a bottled water ban yet—the stars haven't been aligned—but we started installing refill stations," Taylor said. "We have seven around campus with chilled, filtered water—I wasn't keen on chilled water because of energy usage, but we found that people are more likely to use the refill stations when they have chilled water. We've seen far fewer plastic bottles around campus, and the stations help raise awareness of the issues of bottled water."

The University of Prince Edward Island also does source separation—separate streams for waste, paper, and water—with waste going to an incinerator and sending heat and water back to the campus. "We use absorption chilling cycle for heat sources; it's a success story—it lets us ride the oil market because we aren't using only one source, which provides price stability," Taylor said. The school also reuses 40 percent of its solid waste instead of sending it to a landfill.

WATER CONSERVATION INNOVATIONS

Water only becomes an issue for the **Evergreen State College**, Olympia, Washington, in the summertime, since "we get about 50 inches of rain a year," said Paul F. Smith, director of facilities services. "Internally, we're looking to reduce domestic water usage because it helps the budget."

Evergreen has installed a cistern in its newest renovated building, to collect rainwater for use in restrooms and for irrigation. Renovations are opportunities to install waterless or low-flow urinals, dual-flush toilets, and faucets with timed sensors for automatic shut-offs—"that is now standard for any renovations," said Smith.

Working with an on-campus weather station that measures evapo-transpiration rates, the facilities department shuts down irrigation after a rainfall and is working with making that an automatic system.

At **Ball State University** in Muncie, Indiana, "We try to limit water use for irrigation by using wells," said James Lowe, director of engineering. "We capitalize on a broad base of interest and gather everyone together to talk about water use. We're always looking for ways to reduce and recycle."

Ball State is "leaning on LEED certification for new buildings and construction project. For specifications, you would find all you need for low-flow water systems." A "very aggressive" renovation effort over the past few years includes installing low-flow devices throughout the campus. "One way to reduce water use is to remove old, large users of water with every project," Lowe said. "Anytime we work on residential units for routine maintenance, we replace shower heads."

Ball State has seen very little increase in water use, even though there has been growth on campus, said Lowe.

The issue for **Emory University**, Atlanta, Georgia (another 2012 APPA Sustainability Award winner), is familiar through-

out the American southeast: water shortage caused by drought conditions. "We're a small watershed with a large and growing population, so we're trying to think innovatively about addressing water usage," said environmental engineer Brent Zern, P.E. That means three main strategies:

- "We started with cisterns around campus as part of new building construction for using rainwater for irrigation."
- "We have a green building effort—we embraced LEED, green plumbing fixtures, low-flow faucets and toilets, combined with innovative stormwater technologies—we collect rainwater in cistern-like tanks to use for toilet flushing, and collect greywater for flushing from laundry facilities, dishwashing, sinks, and showers."
- "We are building a comprehensive water reclamation facility that will treat blackwater—sewage—and reuse reclaimed water primarily as makeup."

The new facility will be capable of producing 200,000 gallons of water a day, although not all will be needed every day; leftover water will be used for irrigation and flushing. "It will give us almost a 25 percent reduction in our water footprint," Zern said. "From a sustainability standpoint, it is awesome!" Knowing that water rates will "only go up," Emory is positioning itself to respond: "The economics are also impressive—there will be tremendous savings."

The technology involves a hybrid system, "never been used before in the U.S.," that combines two existing technologies: Organica Bluehouse and Living Machines. "We wanted more capacity than either could provide, and we have odd-shaped parcels of land that are adaptable," Zern said. Organica Bluehouse is essentially an adaptive ecosystem in a greenhouse building, featuring special plants with root systems that dangle below and clean the water. When about halfway clean, the Living Machine simulates tidal flow and rains by pumping water through biocells, providing a final cleansing.

"This will save a ton of money and a ton of energy, and it will provide a great educational value to our students, faculty, and staff," said Zern.

A BUILT-IN ADVANTAGE

Educational facilities professionals have built-in access to a huge resource in working to conserve and manage resources: the research power of a college or university campus, through both collaboration with faculty, staff, and other departments, and the hands-on contributions of students in a variety of disciplines.

"We work a lot with students in Environmental Studies and

the Student Environmental Society" on research and projects, said the University of Prince Edward Island's Taylor. "We try to work with residences, and we work closely with the Engineering Department." For instance, an environmental studies class surveyed the campus to gauge awareness of issues and activities, asking students, "Do you know about …" both collected knowledge and relayed information.

At the Evergreen State College, some program units (the school's version of departments) are involved in sustainability, according to Smith. "We have organic farms and various gardens reflecting local flora, and have done projects with students and faculty for bioswales, which reduce runoff and the need for irrigation," he said.

Emory University's bioretention facility.

"Archaic" water laws in Colorado mean that CSU cannot capture rainwater and use it for dual purposes; a greywater research project is ready for implementation once the school can clarify it will be legal, Dollard said. "We do have a system in a residence hall involving capturing shower and hand-sink water and using it to irrigate around the building." That project is a partnership with the Civil Engineering Department.

"When researchers come to us, we work with them," Dollard added. A horticulture researcher wanted to test plants for a green roof, and the facilities department had a location available. Facilities is also working with mechanical engineering as they recommission and retrofit buildings. The whole campus benefits: "Everybody's getting smarter—and students are getting valuable experience," she said.

There is "lots of research" into water use at CSU, thanks to the Colorado Water Institute and because of the school's roots as an agricultural university—"we have civil engineering, weather, and climate studies as core competencies."

Ball State has a geothermal project underway that will let the school reduce water use. "The old process of cooling towers is no longer needed," said Lowe. "We're looking forward to a 36-million gallon reduction—13 to 15 percent—in water use when it's done."

The school has "enjoyed an aggressive program of returning water to the plant" and is finding ways to reduce its makeup water by changing to filters with reverse osmosis. "We think we can save 40 percent of our makeup/condensate return and see less use of the soda ash system," said Lowe. "That's remarkable for a campus of 800 to 900 acres."

Ball State is one of many campuses that have recognized that improved boiler systems contribute to water conservation efforts by reducing the amount of water they have to buy.

Most of the green roofs at AU, which recycle and use water efficiently, were built by volunteers through a partnership with the neighborhood adjacent to the school. "We call it a green-roof raising," said AU's O'Brien.

To encourage the campus community to use tap water instead of bottled water, AU has retrofitted all water fountains so it is easy to fill glasses and bottles, and replaced some fountains with quick-fill water stations so people can see the advantages of reusing containers. "Our students are really engaged" in such efforts, O'Brien said. "The student government resolved that funds may no longer be used for bottled water, so the school is moving to the same principle, calling for coolers and biodegradable cups."

Three outreach efforts at AU offer insights for colleagues:

- Green Teaching, with a checklist for behavioral changes that can be used in the classroom;
- Green Office program;
- Green Eagle Program (the eagle is the school mascot) of peer educators—students trained by the facilities department on issues and behaviors.

"These are all designed to do peer education and outreach about water use and conservation," O'Brien said.

AU also has a Sustainable Living Community—a residence hall with students from different disciplines who take a sustainability course together. They have developed a stormwater map that facilities can use to calculate runoff and identify areas to take action.

GETTING THE WORD OUT

Communicating about the need to manage water use and conservation efforts is, of course, key to success. At the University of PEI, Taylor does guest lectures and his department maintains a website to inform the campus community about projects and concerns.

CSU can rely on the Colorado Water Institute, which Dollard said "does a fantastic quarterly communication that reaches all across the west." A campus energy coordinator works with faculty and staff on behavioral factors, including reporting on issues that "help us keep water usage at bay," she said. "We try to communicate with students electronically, but students have so much information coming at them that it's hard to get through. We

interact with the sustainability group in student government."

Ball State's efforts benefit from having had an organization on campus for 20 years that focuses on environmental issues. The Council on the Environment, established as a collaboration between the academic and business sides of the school, meets every month with representation from student groups, faculty, and the community. "It's one way to move the message to everyone in the campus community," said Lowe.

Lowe himself never misses opportunities to "speak to anyone on campus about sustainability so we all can learn and grow." His department works closely with student organizations and other departments. The school also has a minor in sustainability, which enhances facilities' efforts.

One communications innovation at Evergreen is a Resource Conservation Management Grant that supports a half-time employee who is working on putting up educational stickers, obtained through a student government grant, and writing articles about water use and conservation for the department's intranet. A Clean Energy Committee sponsors energy and conservation projects as well.

At Emory, an Office of Sustainability Operations provides "constant awareness across campus through signage, e-mail, and events" about water use and conservation efforts. "In our green buildings, we have a whole educational process, through pamphlets and signage, for using low-flow toilets," said Zern. "And the county made us dye toilet water blue to reinforce the message that it isn't potable."

Interactive energy dashboards in Emory's newer buildings let students see real-time usage of water and other resources. Facilities builds interest in water conservation by creating competitions between buildings to reduce water usage.

For the new building and technology, "we're coordinating faculty charettes so we can be sure to have what they need, such as sampling ports and interactive displays," he said. He has student interns in place for the summer to develop a communication plan, signage, and tour materials, in expectation of a great deal of interest in the new Bluehouse and Living Machine system.

LOOKING AHEAD

These are only a few examples of how APPA institutions are making a difference in water use and conservation. For more information and resources, go to the APPA website and look for the Sustainability Awards.

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BY STEPHEN M. SPIWAK

Managing Water SCARCITY

WHY WATER CONSERVATION MATTERS TO BUSINESS

The issue of water scarcity has often hit the headlines in the past several years. Some states have gone to court over water rights and access even as others have agonized over scarce supplies. Water scarcity and drought have far-reaching impacts on regional and global economies and ecosystems. More than 20 percent of the world's population lacks access to safe drinking water, and more than 40 percent live in water-stressed areas.

The bottom line is that our water stewardship practices have significant consequences for people, industry, and the environment. As nations develop, industry accounts for an increasing percentage of total water use, often creating conflicts between industrial water needs and water required for agriculture and human consumption. This leads to industry efforts to conserve and reduce water use.

University presidents and their staff of directors understand that the days of unlimited, inexpensive water are almost over. While it remains inexpensive in comparison to other components of the heating and cooling processes, it is often the most visible reflection of the impact on the local environment. Much attention has been focused on this central issue and exploring different methods of assessing and tracking water use on campus to drive awareness and ownership with employees, guests, and the student body. While assessing water footprint and flows is a good first step, it is critical to further identify and understand the solutions and their economic, social, and environmental impacts.

BUSINESS IMPLICATIONS

So why conserve? It's simple: Conservation can have a positive impact on your bottom line, but perhaps more importantly, it can position your system to function successfully in the future as water becomes both more scarce and expensive. Adapting your system so that it can deliver reliable service in the face of water cost increases and usage restrictions will position you as a leader in sustainability and enhance your reputation in providing a cohesive and fulfilling learning environment. Fortunately, there are steps toward water conservation you can take right now to protect this valuable resource for the future. A few of them are discussed in this article.

THE WATER-ENERGY NEXUS

While conserving water is easy to talk about, there are hidden roadblocks and unforeseen issues in implementation. Consider, for example, the water-energy nexus—water and energy are connected, as it takes water to make energy and energy to make water accessible and usable. There are significant costs and ultimately savings associated with this water-energy relationship that need to be considered in a water conservation program. The key is to understand the water-energy relationship as you choose new methods and technologies to address your total campus water footprint reduction goals. For example, you may try to condition the water through mechanical means, but the energy to run that equipment can outweigh the benefits of the water saved.

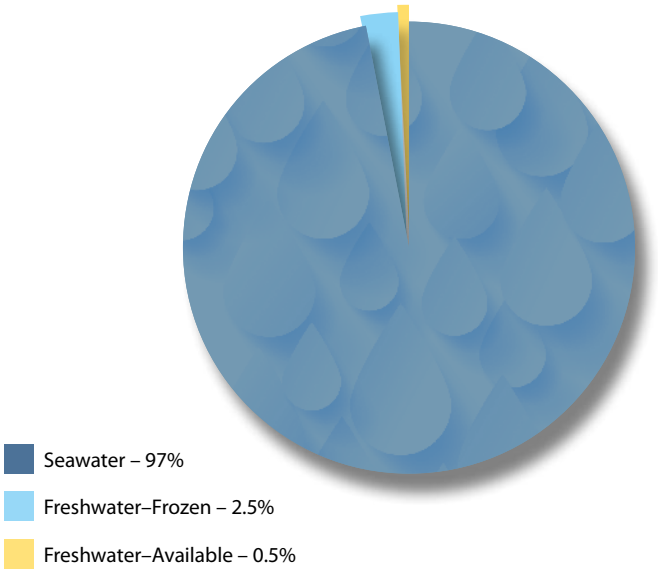
State and federal legislation also plays a key role in campus water conservation efforts. An increasing number of state and federal mandates require industry to achieve a water-reduction goal of 10 to 20 percent. For example, California's Water Conservation Act of 2009 (Senate Bill SBx7-7) requires a statewide 20 percent reduction in per capita urban water consumption by 2020. Water suppliers that fail to meet their water use targets will be considered in violation of the law and face administrative or judicial proceedings after January 1, 2021. The expectation is that there will be significant financial repercussions for those water purveyors failing to meet these new state and/or federal requirements. In the end, the facility departments on a campus and other water users in those areas will feel the pain because the fees will get passed on to the end users, ultimately raising the cost of water.

Finally, you must look at the impact that water use may have on your school's reputation within the local media. How will your water footprint or conservation efforts impact student retention and attraction? Most campuses have seen the student body become active in sustainability issues. Embracing that student body enthusiasm while marketing those efforts in school or local newspapers can result in a true win for the school, students, and facility managers. The approach you use can affect your campus customers (i.e., faculty, students, employees, and guests). Opinions matter and good faith efforts to do the right thing are marketable.

ACTIONABLE STRATEGIES

In developing a plan for reducing overall water consump-

GLOBAL WATER SOURCES



Source: World Business Council for Sustainable Development.

Opinions matter, and good faith efforts to do the right thing are marketable.

tion, one can take a hierarchical approach similar to the reduce-reuse-recycle concept that is often applied to other waste reduction efforts. With this method, we tackle the easiest and least expensive solutions first, and then proceed to more elaborate solutions to attain further savings. The easiest way to reduce waste—of any resource—is to use less of it. For campus central heating plants or any stand-alone HVAC systems, this means running our facilities at maximum efficiency using the least amount of water possible, given our existing equipment. We might also look for ways to reuse some of the water going through the system for a second or third process, thereby getting more "work" out of the same amount of water before it is ultimately discharged. The third step—recycling—would involve treating used process water to make it acceptable for a second or third process.

As providers of heating and cooling, campus facility directors automatically focus on the biggest water users—chiller and boiler systems. Ideally, however, our efforts should start with the water as it enters the plant. It's important to understand the quality of the water entering your facility as well as where each gallon goes. Document and map all water inlet, usage, and discharge streams. This will provide the foundation for conducting water-balance studies and ensuring that your plant's total water footprint is accounted for.

Water Facts Drive Sense of Urgency

The facts illuminate the need to conserve water: Nearly 1 billion people (one in six globally) live without regular access to freshwater. While this sounds surprising, consider that most of the earth's water is salt water. A mere 3 percent is freshwater, and 2 percent of that comes from ice and snow. The remaining 1 percent is surface water from lakes, rivers, etc., which is available for consumption or use.

Let's break this down even further. Nearly 70 percent of the available global freshwater is used for agriculture. In addition, industry accounts for the use of another 20 to 22 percent of that freshwater pie. The rest is consumed by nature and humans. The bottom line is this: Water is scarce, still affordable and, although we don't like to admit it, wasted.

There are many water conservation solutions available to facility managers on campus. The key to choosing the best option is understanding the impact of any given strategy on your level of energy use (increased/decreased), overall metered water use, legislation/potential funding from state or local entities, and finally, your school's reputation and need for green accreditation (i.e., LEED [the U.S. Green Building Council's Leadership in Energy and Environmental Design] certification or the ENERGY STAR label, etc.). These are the basics behind defining your sustainable solution to water conservation.

Following is a short list of some of the more common water conservation approaches used on a campus. This list continues to grow as new technology makes it easier to reuse and manage your water supply while supporting your water conservation goals.

1. Use of alternative water sources:
   - Rainwater—geographic-specific, requires good maintenance of stored water
   - Greywater—requires access but can be a cheap resource
   - Recycled wastewater—requires access, sometimes referred to as "purple pipe water"
2. Increased return of condensate to the boiler plant
3. Continuous tower cycle management, with automated fluctuation of cycles based on water characteristics achieving optimum water reuse 24/7
4. Reverse osmosis reject water for cooling tower makeup
5. Water softening in cooling towers, especially in high-cycle, high-volume towers

With so many issues to consider—including understanding a facility's water footprint and how new techniques and technologies are used—this course of action can be difficult. However, taking the time to properly consider the overall impact of water conservation strategies on not only water use but also energy use, asset preservation, and reliability will help campus facility managers customize their strategies and ensure that their facilities' goals are achieved. With fresh, usable water supplies constantly changing, proactive planning is certain to become critically important.

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Recycling in Schools & Universities

By Nick Meeten

Many schools and universities are fortunate enough to have playing fields and gardens for their students and staff to enjoy. These green areas require water and nutrients to maintain the health of the grass and vegetation and in many regions due to insufficient natural rainfall and/or poor soils, these natural resources must be provided artificially via irrigation and fertilization. In arid regions, this can add up to significant volumes of irrigation water required, water that is increasingly being demanded for other uses.

The Rectorate Tower at the Universidad Nacional Autónoma de México.

WHAT GOES IN MUST COME OUT

Let's now quickly consider the waste streams generated in schools and universities. Why is it that in developed countries we have changed our behavior and now routinely sort and recycle our solid waste, yet we still generally deal with our liquid waste the same way we have done for the last few hundred years? Flush and forget!

Before we go any further, I would like to redefine a term used in this article. What has traditionally been referred to as "wastewater" we now refer to as "used" water. Used water should also be judged on its quality, not on its history.

So what is typical used water generated in schools and universities? It is typically about 99 percent water, with the remaining 1 percent mainly made up of organic compounds. Used water contains nutrients such as nitrogen and phosphorous. When we judge it on its quality, it is liquid fertilizer.

Of course, used water also contains bugs, bacteria, and viruses that can make people sick. However, thanks to schools and universities, we have learned a few things over the last 200 years. With this accumulated knowledge, experience, and advances in technology, these days it is quite easy to treat used water to allow it to be safely recycled for non-potable reuse. The costs of these recycling systems are steadily coming down, while the reliability and rewards (both financial and environmental) are steadily growing.

So on one hand, in many schools and universities we must apply valuable drinking quality water and nutrients to the landscape. Yet on the other hand we are throwing away perfectly good liquid fertilizer in the form of used water. For the sustainable use of energy and natural resources such as water and nutrients (in particular phosphorous), it is now the right time to close this wasteful open loop.

HOW TO MANAGE RISK

Ensuring the health of people must always be the highest priority. And we can do this. In our everyday lives we routinely use something which is invisible, silent and odorless, and yet a short exposure can kill us. We manage the risk of this so

Apartment complex in Straubing, Germany using wastewater heat exchangers.

well that we don't even think about it much, until you are a parent and you see your child poking things into an electrical socket. Then you are instantly reminded of the risk associated with electricity. Compared to electricity, recycled water is relatively innocuous.

With recycled water, the potential health risks can be managed with different levels of hardware (which produce different qualities of recycled water accordingly) in combination with regular monitoring of the system and controls over where, how, and when the recycled water is applied.

On the hardware side, membrane technology such as membrane bioreactors (MBR) provides high-quality recycled water using a purely physical process (i.e., without the use of disinfection chemicals such as chlorine). This is an important consideration since chlorination levels required for recycled water are likely to be higher than those found in drinking water, and these higher chlorine levels may have a negative effect on the plant foliage and soil microorganisms. This then defeats the purpose of using recycled water in the first place, if the recycled water makes your plants and soil sick.

There are a number of established guidelines for water recycling risk management, issued by organizations such as:

- WHO (World Health Organization)
- U.S. EPA (Environmental Protection Agency)
- Australian Guidelines for Water Recycling

Another component of water safety we need to be aware of relates to the risk of pharmaceuticals in recycled water. For easy-to-understand information on this issue, go to: *www.athirstyplanet.com/real_life/valuable_research/reuse_safe*.

WHAT EQUIPMENT IS INVOLVED IN WATER RECYCLING?

The answer to this question depends upon what technology will be used to treat the used water. However, there are also some elements that are required in almost every case.

- A pumping chamber with a coarse screening filter or something similar for getting the used water out so it can be treated.
- Flow equalization tank. Dependent upon the treatment technology used but generally used water needs to be captured during the periods of high flow, and stored to provide a more constant supply through the system during times of low flow.
- Recycled water storage tank. This is dependent upon the design of the irrigation system.
- Pumps, air blowers, controls, etc. All dependent upon the treatment technology chosen.

WHAT ELSE CAN WE DO WITH USED WATER?

Water is a good conductor of energy. Better that air. For every degree Celcius of temperature change, water can move around four times as much energy as the same mass of air. Compared to outside air, used water also flows are relatively stable and neutral temperatures all year round. On hot summer days, used water is cooler than ambient air. On cold winter days, used water is warmer than outside air. When you add

these factors together, used water in conjunction with a heat pump can provide an efficient energy source for heating and cooling buildings.

Unfortunately, most heat exchangers are designed to operate with clean fluids. When you pass used water through them, they tend to block up relatively quickly. There are, however, heat exchangers that are specifically designed to cope with dirty water. These now make it possible to utilize used water as an energy source for heating and cooling, with significant gains in efficiency.

PROJECT EXAMPLE 1: UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO

UNAM in Mexico City is one of the largest universities in the world, with a total population (staff and students) of approximately 350,000. The central campus covers an area of over 7 sq. km and contains over 40 buildings.

Part of the UNAM research program is applying new technologies for water reuse. A new used water treatment plant with a capacity of 1,500m3/day was installed in 2010. The plant features mechanical pre-treatment with a compact system and treatment using a filtration unit with a 3840 m² membrane surface. The plant produces high-quality recycled water, which is used for irrigation of nearby greenfields. The plant will also be used as a demonstration project for communities to overcome the supply problems in arid regions in and around Mexico City.

PROJECT EXAMPLE 2: ACCOMMODATION APARTMENTS — STRAUBING, GERMANY

The heating for a complex of 11 apartment buildings (with a total of 102 apartments) is provided from energy extracted from wastewater flowing in a sewer main running past the site. The wastewater flow is extracted from the sewer, mechanically pre-screened, then passed through special heat exchangers. The heat exchangers are in turn connected to conventional heat pumps, which allow highly efficient energy extraction from the wastewater. The cooled wastewater is then simply returned to the sewer.

This system has been successfully in operation for two years and provides seasonal Coefficients of Performance (COP) over 5.

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By Olen L. Pruitt and Patrick D. Guccione

Capturing & REUSING

AIR HANDLER CONDENSATE

WITHOUT DIGGING UP THE CAMPUS

THE COST AND AVAILABILITY OF NATURAL RESOURCES HAS BECOME A REAL CONCERN for educational facilities worldwide. Twenty-five years ago, water was abundant in Birmingham, Alabama. However, within the past decade, especially during the last five years, water has become an expensive and scarce commodity. Factors contributing to this include summer droughts that lead to water use restrictions and intra-state legal fights over water consumption rights for the rivers flowing through multiple states.

The University of Alabama at Birmingham (UAB) has experienced rapid growth in the last decade. In addition to educating over 17,000 students annually, UAB is a major research facility and academic healthcare center. UAB has over 200 buildings with approximately 16 million square feet of space spread over 80 city blocks, taking up much of the southern half of Birmingham. With over 18,000 employees, UAB is Alabama's largest employer and the single largest contributor to Birmingham and central Alabama's economies, with a $4.6 billion annual impact.

Due to growth and expansion, UAB requires more and more water to sustain operations. The central chilled water system serves over half the campus. The buildings served by this system are critical facilities (60% acute healthcare and 40% research labs). Reliability of this system is imperative, making the supply of water to sustain system operations vital.

UAB's central chilled water system has three central plants connected to an underground closed loop distribution system.

UAB'S PHYSICAL PLANT INFRASTRUCTURE

- Centrifugal Chillers: 15 (2,000 – 4,000 tons)
- Cooling Towers: 19
- Condenser Systems: 9
- Supply: 42°F
- Return: 54°F
- PLC controlled to maximize operation and efficiency
- Central Plants: 3
- Total Capacity: 38,000 tons
- Peak Cooling Load: 28,000 tons
- Minimum Winter Load: 5,500 tons
- Distribution: 4.5 miles
- Piping: ranges from 6"– 36"
- Total Chilled Water Volume: over 1.5 million gallons
- Area Served: over 8 million ft^2 on chilled water loop

SUSTAINABILITY: A HIGH PRIORITY

UAB is an established sustainability innovation leader in Alabama, so any project must meet sustainable criteria. The central chilled water system is a major energy consumer, responsible for nearly one third of total campus electrical use. Alabama's heat and humidity results in heavy air conditioning need. The demand at UAB has increased with the university's growth; 2010 electrical power consumption was up 18 percent from 2006, despite effective conservation efforts.

ENERGY CONSERVATION MEASURES

Programs to reduce energy consumption were implemented for the central chilled water system:

1. Removed all three-way valves
   a. Eliminated low delta T syndrome
   b. Increased delta T, which increased overall efficiency
2. Upgraded to high-efficiency cooling towers
   a. Replaced old 78°F wet bulb towers with new high-efficiency 80°F wet bulb towers
   b. Reduced entering condenser water temperatures below design
3. Improved average chiller efficiency to 0.59 kW/ton

Existing chilled water distribution system piping could be used to move the condensate from the buildings to the main plants.

RELIABILITY IS CRITICAL

Approximately half the space at UAB (8 million square feet) employs chilled water cooling from the central chilled water system. Fifty-two of UAB's key buildings utilize this system, including critical care units and research labs.

The central chilled water system air conditioning is vital at the acute care hospital. For life-support patients in the 1,000-plus bed facility, maintaining levels throughout temperature dependent surgical suites and intensive care units is imperative. Other buildings served by chilled water include research facilities with specialized procedural labs, animal housing, and labs with research stored in freezers. Each building is connected to the distribution system with a flow meter and is billed monthly for MMBTU usage.

RELIABLE MAKEUP WATER SUPPLY IS ESSENTIAL

Alabama experiences about 100 days of extremely hot weather annually. During peak summer months, the UAB central chilled water system requires over 1.2 million gallons of cooling tower makeup water daily due to evaporative and blowdown losses. With over 86 blocks of campus, frequent droughts and subsequent water restrictions, and ongoing tri-state water rights battles, concerns about water use and conservation continue.

THE SOLUTION

UAB considered recovering and using the millions of gallons of high-quality condensate water being wasted down the drain. The main obstacle was that most of the condensate would be collected in buildings far from the cooling towers where the water was needed. Digging up the streets in downtown Birmingham to install a distribution system to pipe the air handler condensate back to the chilled water plant's cooling tower was not viable. However, a simple solution was already in place: the existing chilled water distribution system piping could be used to move the condensate from the buildings to the main plants.

ANALOGY OF A MASS TRANSIT SYSTEM

The central chilled water distribution system has long been considered solely a closed loop running throughout the campus. With their new water recovery concept, UAB viewed the central chilled water distribution system like a mass transit subway network, where people enter and exit at different locations.

Seeing the system from that perspective, the existing lines of the chilled water distribution system were already near the condensate drains and the plant cooling tower water return lines. Everything was in place near the areas where water needed to be put in and taken out.

CONDENSATE COLLECTION

Two to five small condensate recovery tanks were installed in the main mechanical room to collect the condensate water at each building in the program (the condensate drains by gravity into the tanks). Each tank has a small, standard sump pump to move the condensate to large, centrally located collection tanks, typically holding 250 or 500 gallons. These larger tanks can generally handle the condensate from two to four small tanks. Water from the large collection tanks is pumped through a filter into the main chilled water return. Water meters are on all points of feed into the chilled water return.

RELIEVING FIN WATER TO THE COOLING TOWER

At the central plant, the chilled water return line is over-pressurized by the condensate water pumped into the system at the building locations. The return line is typically maintained at 76 psig (pounds per square inch, gauge), so the control valve has a set point of 76 psig to bleed water into the cooling tower system.

As a safety precaution, the controls are programmed for the fin water control valve that relieves into the cooling towers to remain closed if any makeup pump is running. Also, there is a remote safety in place to limit pressure by stopping all condensate pumps if the pressure in the return line exceeds the set point with a maximum of 80 psig.

PROJECT CONCERNS

UAB was entering uncharted territory for condensate transport so initial concerns existed:

a. Over pressurization
b. Flooding in collection areas
c. Water chemistry changes
d. Increased maintenance

To enforce system reliability, several safeties and redundancies were installed. The high-pressure safety set point in the PLC (programmable logic controller) logic stops the remote collection pumps if the pressure builds above 80 psig. To protect against power outage or pump failure, all collection tanks and pumping tanks fail back to the drain by gravity. The discharge temperature of the water at each pumping location is monitored with RTDs (resistance temperature detectors) that indicate water is actually being pumped (a temperature increase indicates water is not flowing).

WATER CHEMISTRY CONCERNS

- Fin water is basically pure distilled water and therefore more corrosive than Birmingham city water, which was previously used as makeup.
- Fin water is "oxygen rich," having been freshly aerated at the air handler coils. This adds to the corrosion loading.
- Fin water at some air handlers is "dirty," creating a filtration need.
- Fin water is not sterile, making it important to create an effective biological control program for the chilled water that is not corrosive to the system metallurgy.
- Any chemistry used in the chilled water must be compatible with the cooling tower chemistry as the two programs comingle in the tower system.

The first two problems required a stronger corrosion inhibition package that would not rely on oxygen scavenging as a corrosion inhibition mechanism. To accomplish this UAB

evaluated corrosion inhibition technology and did significant laboratory research on a proprietary blend of silicates, azoles, and polymers (patent applied for). This resulted in excellent corrosion inhibition while providing the benefit of compatibility with the cooling towers' ongoing treatment regime.

The corrosion rate for mild steel averaged less than 0.015 mpy (mils per year) and copper averaged less than 0.025 mpy. Of note is the fact these rates are better than what is normally achieved using traditional chemistries. Corrosion rates were monitored continuously using Rohrback model 9020 dual channel corrators and confirmed with corrosion coupons.

The next challenge was that the fin water at many of the air handlers was contaminated with dust, dirt, and other debris. This was resolved by installing filtration at the main collection points and filtering the water before adding it to the main chilled water distribution system. UAB used Harmsco filter bodies with Watts Co. 100 micron filter cartridges.

The final challenge was biological control for the chilled water system. Far greater quantities of water would now be added into the chilled water system without the benefit of residual chlorine (as found in city water). This water is a natural and productive breeding ground for bacteria.

Based on the projected amount of fin water to be recovered and the pass through rate to the cooling towers, traditional non-oxidizing biocides were dismissed for performance and economic reasons. Traditional halogen (oxidizing) chemistries were also rejected due to potential for increased corrosion. Chlorine dioxide (ClO_2) emerged as the preferred biological control agent. Recent advances in ClO_2 technology made this approach safe, economical, and effective. Due to the loop's size, three Pureline Model HP-10 ClO_2 generators were installed (10 lbs of ClO_2 daily). UAB selected Pureline because the units use a single chemical precursor, thereby reducing the potentially hazardous chemicals onsite.

Since ClO_2 did not have to be fed continuously to the chilled water system, excess ClO_2 was available for feed to the cooling towers, which allowed UAB to eliminate bromine feed. ClO_2 residuals were measured and controlled using 12 SensoreX low-range ClO_2 probes. One probe was installed in the main chilled water line in each of the three central plants, plus one in the cooling tower water supply line to each of nine condensers.

Biological activity in the closed chilled water systems and the three tower systems was monitored using both ATP testing and standard dip slides. Results in all systems were excellent, but to be noted are the chilled water results where, after initial control was achieved, results using both test methods were essentially below the levels of detection by the tests.

PROJECTED ECONOMIC BENEFITS

UAB calculates Return on Investment (ROI) on a "per building" basis. Fin water projects completed in the heavy research buildings have a ROI of approximately three to three and a half years. These buildings are 100 percent outside air and typically have 25 to 40 air exchanges per hour.

EXAMPLE

UAB Bevill Biomedical Research Building (ROI was calculated on water savings only)

- Area: 223,712 gsf
- Outside Air: 100%
- Condensate Collection: from five air handlers
- Peak gpm: 5
- Annual Gallons: 2+ million
- Water Cost: $3.17/ccf
- Estimated Annual Savings: $9,000
- Estimated Project Cost: $30,000
- Simple Payback: approximately 3.33 years

PROJECT ROI BONUS

The chilled water loop makeup rate is 500 gph, which totals 4,380,000 gallons/year. Previously, the makeup water came in at 65°F. Currently, the makeup demand is completely met with the recovered fin water at 45°F. This is a savings of 20 BTUs per lb, which is 730 MM BTUs annually, for another $10,000/year. Additionally, the cold water makeup to the cooling tower increases the approach by approximately one degree, resulting in additional savings.

POSITIVE RESULTS ACHIEVED

The first fin water recovery system was installed in May of 2011 in a group of research buildings. Throughout 2011, five other systems were installed. Currently, six large research buildings have fin water recovery systems in place. Since May 2011, UAB has collected 3.7 million gallons of recovered water. With just these six buildings, UAB projects to collect over 10 million gallons in 2012. By summer 2012, two more large research buildings came online, which added approximately 5 million more gallons.

Benefits of the fin water recovery system are both economic and ecological. By recovering the fin water, UAB has reduced the amount of domestic water usage and wastewater while conserving a valuable natural resource. Although the amount of collected and recycled condensate water varies seasonally, the water is most abundant during warmer months when the need for makeup to the cooling towers peaks. Furthermore, the cold condensate provides additional cooling to the cooling tower, circulating water free of cost.

As UAB's campus grows and expands so will the fin water recovery system. Future construction of new buildings will incorporate plans for a corresponding fin water recovery system during the design phase. UAB's goal is to recover over 20 million gallons of condensate annually within the next three to five years.

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Disrupting the National Electrical Code

By Mike Anthony and Paul Kempf

"Enough is abundance to the wise"—Euripides

While much of the educational industry engages in marquee sustainability projects like solar panels and wind turbines, a rather unflashy code change driven by APPA's Standards and Codes Council (ASCC) will exceed the benefits of them all. When fully realized, the changes driven into the 2014 National Electrical Code (NEC) by the ASCC to "rightsize" electrical switchgear (according to actual load) will save our industry $1 billion to $10 billion annually—with each APPA member institution sharing in the benefit proportionately. Here's why.

For the past 60 years, electrical engineers have designed lighting circuits according to prescriptive rules that appear in Table 220.12 of the NEC. When the 2014 NEC is adopted, engineers will now have an *exception* that permits circuit sizing based upon power densities that are limited by the energy code. The disparity between the old NEC rules and the new energy codes is not small, as can be seen in Figure 1. Keep in mind that in higher education, the dominant occupancy class is classified as office space.

Given that lighting is typically about 30 percent of the electrical load in most buildings, medium voltage service transformer kVAs may be reduced about 15 percent. Downstream distribution transformers that supply lighting only can be reduced about 60 percent. The practical effect of this change is as follows:

1. In borderline cases in which demand calculations indicated a 1000 kVA substation by "rounding up for future load growth," this substation may be specified at 750 kVA with a forced air rating to accommodate demand peaks.
2. Lower kVA nearly always results in reduced flash hazard.
3. Lower kVA reduces the size of medium voltage switchgear rooms.
4. Lower kVA means lower heat losses and smaller HVAC systems and ductwork for cooling.
5. While relatively rare, 150 kVA dedicated "lighting" transformer may now be specified at 50 kVA requiring a smaller electrical "closet."
6. A 400A copper lighting feeder of 1000 FT that used to cost about $6,300 for copper could be now designed as a 300A aluminum feeder for about $1,700.
7. Farther up on the grid, avoided no-load losses at medium voltage is $43,860 per year for every 10,000 kVA of connected load.
8. Universities that cogenerate will see a reduction in reactive (kilovar) load. One or two percent higher power factor could save hundreds of thousands of dollars per year.

Occupancy	2014 NEC Table 220.12	ASHRAE 90.1	2012 IECC
Office	3.5	0.82	0.90
Hospital	2.0	1.05	1.10
School	3.0	0.87	0.99

Figure 1. Comparison of lighting power densities in watts per square foot.

> WE ARE DISRUPTING THE NEC BY LOADING TRANSFORMERS ABOVE THE 50 PERCENT CAPACITY RATING.

There are cases where transformers with redundant capacity are necessary. Double-ended substations are common in healthcare facilities, laboratories, and critical processes; and in high-rise facilities large fire pumps may require larger transformers to protect contingencies. These are a minority of cases, however, and many of those transformers already have significant short-time overload capability.

The requirement for an energy management system to control the lighting load may not be necessary, but the conditional exception was what the committee needed to keep the change within its risk tolerance. We are disrupting the NEC by loading transformers above the 50 percent capacity rating, whereas for the past 60 years we have loaded them

well below 50 percent. It may be wise to see how this change moves through and is integrated into the culture of the electrical industry (*see sidebar*).

The NFPA (National Fire Protection Association) is a safety organization—not an energy conservation organization. Until the ASCC presented arguments that flash hazard safety was undermined by bringing in too much energy into a building in the first place, the Chapter 2 committee was not going to move on arguments on the basis of energy economics alone. Professor Tom Harman at the University of Houston, as chair of the task force that evaluated the ASCC proposals, was a significant contributor to the effort and needs to be recognized here.

The consortia of like-minded electrical engineers affiliated with 30 APPA member institutions that drove this into the 2014 NEC did not get everything it asked for—only about half. We will approach the Chapter 2 committee again during the 2017 revision cycle and present more data to support a case for following:

1. Removal of the requirement for the energy management system.
2. Reduction in the NEC 220.14 per-outlet design requirement to 120 VA from the present 180 VA.
3. Demand factors for sizing supply switchgear for buildings with multiple HVAC units.

From the data that the ASCC gathered a pattern emerged: *we have been designing buildings for 15 watts/square-foot while our electric bills are telling us that we are consuming only about 5 watts/square-foot*. A strong case can be made that most of the buildings on our campuses today could be supplied from low voltage services, thereby eliminating many medium voltage substations altogether. We would expect another $1 billion to $10 billion per year in avoided cost to accrue from these changes to the NEC.

For APPA executives, this change should immediately set in motion project financing architectures that draw from sustainability and safety resources to fund electrical upgrades. Older, higher loss medium voltage transformers installed in the 1970s and '80s that never saw more than 25 percent of rated capacity would be good candidates for replacement with an 800-ampere, 480V service instead. Anecdotes are accumulating that some owners in the private sector are replacing oversized copper feeders with rightsized aluminum feeders and pocketing a "profit."

These upgraded, smaller services might release some enterprise space—or at least make non-compliant installations compliant with NEC workspace safety rules. The money saved in the ASCC's authentic "green" achievement might be used to help pay for some of the headline-grabbing energy conservation projects that will never pay for themselves by any benchmark of classical energy economics.

Rightsizing

As real-time metering and monitoring algorithms are implemented to increase electrical system efficiency we also have the opportunity to "rightsize" our designs. As protection schemes improve and the need for safeguards increase we can take some of what in the past was a reasonable measure of safety factor out of our designs, thus lowering incident energy levels for increased worker safety.

Rightsizing will continue to move the electrical distribution industry in the direction of sustainability as our system designs reduce energy losses, conserve space, save energy, and reduce capital expenditures. Sustainability is good business for all, and at the University of Notre Dame we see the move toward sustainability as an opportunity to embrace the future, follow the right course, and present a challenge to our engineering talents to hone our craft.

In this day and age information is king, and the electrical distribution market has the tools and expertise to use information about our systems for multiple benefits. We have long known that many of our services and supply circuits have been conservatively designed. Our campus data across nearly 10 million square feet of space in over 150 buildings demonstrates maximum historical demands is on the order of 50 percent of installed power delivery capacity.

As this article details there are opportunities to reduce power density assumptions to be more in line with utilization. Having a back stop to prevent overloading as the code transitions to these changes is a prudent approach that will ensure safety while allowing for the benefits of the changes to be realized.

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The Elephant in the Room

By Matt Adams, P.E.

Recently at the APPA Leadership Academy in Tampa, the class of Track III had a vigorous discussion regarding the "elephant in the room" of institutional management. In this track, we teach managerial effectiveness and make every attempt to make the subject matter relevant for our institutional facility managers and leaders.

On the third day of class, we show a great video of former General Electric CEO, Jack Welch, describing his views on promoting, developing, and, if necessary, removing his direct reports. His candor and energetic simplicity is fascinating. He makes many great points, but when he discussed the need to remove or fire some staff, our class of leaders began to feel disconnected from his message. In the corporate world of GE, leaders can (and do) fire direct reports for either lack of performance or demonstration of values that deviate from those expected within GE.

On the other side of the coin is the fact that managers who did perform and demonstrate commitment to the company values were rewarded with one or more rewards of pay raises, bonuses, or even stock options. After 25 years in APPA I have yet to hear of any of our peers earning bonuses of stock options. So this is the "elephant in the room"—the fact that we are expected to lead effectively, but without the traditional tools of management at our disposal.

SO LET'S TALK ABOUT THE ELEPHANT IN THE ROOM

If a retired executive from GE were to visit one of our institutions, he or she would quickly realize that the business environment we operate in includes few of the traditional tools for either employee development or termination. Track III class participants often fall into two groups: those who feel frustrated with the lack of tools for staff management, and those who expend energy and creativity to make it work within the confines of our institutional rules.

There is clear evidence of solutions to this perceived managerial handicap. This evidence comes in the form of peer institutions with great moral and highly productive staff. If these many institutions are able to achieve many of the same winning performance indicators as the private section, our situation must be manageable. What are the managers of these facility departments doing that some of us are not?

At Moravian College, the associate director for facilities, Kim Sherr, is convinced that overcoming any management shortcomings and being successful in staff develop is "not that difficult." She believes that subscribing to the belief that we as managers have few options to lead effectively is equivalent to following the herd—"Don't do it!" To Sherr, the same philosophy of valuing the individual that is embraced in education is also an effective tool for management. In other words, to manage someone without the corporate gimmicks one must go deeper. "Put yourself in their shoes. Are their staff needs that different from yours?"

Clearly our staff doesn't expect big bonuses or stock options. What they seek and relish are less tangible, but perhaps more important: family, respect, dignity, support, assurance. As a leader these are values that serve as reward, and are an integral part of staff development within an institution. This makes a great deal of sense.

While we have many institutions that enjoy high morale and productivity, there are a great many without. In these places staff perceptions are so

common as to almost seem like clichés. When asked, they report feeling a lack of respect shown by the management of the institution. They commonly complain of not being properly informed of managerial decisions or new policies.

They also complain of severely punitive and bureaucratic systems and polices, demonstrated by time recording procedures that demonstrate distrust and add wait time, as well as approval systems for materials that are inordinately cumbersome. These policies are punitive to staff without there having been any infraction committed. To Kim Sherr's point, would I as a manager be motivated if the director imposed similar rules upon me that clearly illustrated a lack of trust?

HOW TO THINK LIKE AN ELEPHANT TRAINER

There exists a new class of leaders that are rising within our industry and who have energy and new ideas. Another of these is Jim Jackson, director of facilities maintenance & operations at the University of Nebraska Lincoln. Jackson takes the elephant metaphor a little further. He believes that as a manager in the institutional environment he needs to think like an elephant trainer. In other words, to most, making an elephant do anything on command is virtually impossible. However, the trainer has learned what motivates the elephant, and they build a win-win working relationship. Jackson believes he has learned what motivates his staff at UNL.

Regarding the values recognized at at UNL, Jackson has learned that the majority of his staff responds to professional satisfaction. This satisfaction comes in a variety of forms, some new some old. One of the best tools used at UNL is the extension of trust and responsibility to reporting staff.

Jackson believes that rather than only relying on one "go-to" person as many of us do, one must reach out to everyone as often as possible. He gives each of his reports a chance to take a chance and succeed. This success is rewarded with both recognition as well as more responsibility. He has learned that a typical UNL building services staffer wants to demonstrate results and find professional satisfaction. He encourages this staff to repeat the same approach at every level so that the potential "performers" from the bottom to the top are nurtured and developed. I have visited UNL many times and I have witnessed an authentic "can-do" attitude.

REWARDS COME IN DIFFERENT SHAPES AND SIZES

While financial benefits are not at our disposal, many of our peers have found other ways to reward staff. Many provide lunch to staff as a reward. However, some have gone beyond that and awarded staff with small gifts that are specifically for them to share with their family or friends. While simple, this distinction is significant. Why not reward a staff member with a gift certificate to take his or her family to dinner. In this way many more emotions are touched, such as pride and support of family. This reaches that person on a much more personal and meaningful level.

Another institution uses small micro vacations as a reward. While not officially a part of the university policy, one director awards half-day passes with pay as one of a variety of incentives. To virtually anyone, a half-day-off pass used on a Friday is as good as a bonus!

Like some many best practices within APPA, we have peers that are really working hard to come up with new solutions and winning strategies. Dealing with the "elephant in the room" is no exception. The elephant can be taught to do what others believed was impossible.

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Clean Safe Office Water is the True Staff of Life

By Janice Nath

Set aside bread — water is the true "staff of life," particularly in the workplace where the water cooler is "ground zero" for refueling our bodies as well as catching up on office gossip. Water, which carries oxygen to our body's cells, makes up more than half of our body weight, and we can't live for more than a few days without it. While our bodies don't get water just from drinking water alone—as any fluids we drink contain water as well as certain foods (think juicy peaches or ripe tomatoes)—consuming pure, fresh, clean water is vital for our good health. How can we ensure that our drinking water is safe in the workplace?

The vulnerability of the world's water to contamination and pollution is part of our 21st century reality, and we must all play the first line of defense in ensuring our water is clean and contaminant free.

Even our military have been exposed to unsafe drinking water. From 1957 to 1987, the drinking water at Marine Corps Base Camp Lejeune, a military training facility in North Carolina, was contaminated with toxins up to 3,400 times permitted by safety standards with the primary chemicals detected being perchloroethylene (PCS), benzene, and trichloroethylene (TCE). In August 2012, President Obama signed the "Honoring Americans and Caring for Camp Lejeune Family Act" bill approved by Congress. The bill provides health benefits to Marines and family members exposed to contaminated drinking water at Camp Lejeune.

Scientists and government regulators are committed to detecting, observing, and regulating potential contaminants in our water. The Safe Drinking Water Act (SDWA) was passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law requires many actions to "protect drinking water and its sources—rivers, lakes, reservoirs, springs and ground water wells" according to the EPA. However, drinking water safety cannot be taken for granted, and the toll of time can result in a system that may wear out as well as inadvertent mistakes that can happen.

When the system breaks down, we run the risk of toxic chemicals that can find their way into the ground's surface and into our tap water. To ensure our best health, we do need to find out if there are any contaminates in our water and what their concentration levels are and if they are contaminants that potentially pose health risks. The United States Environmental Protection Agency, *http://water.epa.gov/drink/index.cfm*, is a great resource to learn more about the safety of the ground water and drinking water in your region.

In many commercial and institutional office buildings, general drinking water for occupants is overseen by the building or facilities manager who is responsible for oversight of proper maintenance of the water pipes. Drinking water also makes its way into buildings from catering suppliers, installation of office cooler systems and individual employees who bring in their own drinking water via bottles and coolers.

Everyone has to be their own primary first line of defense in ensuring that health and safety of their drinking water at work. Here are of some of my primary tips to ensure you keep out of "hot water" and enjoy fresh, clean, and safe drinking water in the workplace:

- **Avoid Plastic Water Bottles**—Plastic bottles are convenient for toting water around on the go, but not all plastic bottles are created equal. Besides tak-

ing a toll on the environment by adding to our landfills, the plastic from plastic water bottles, particularly when warmed up, can leak into our drinking water. A study published in the *Journal of Agricultural and Food Chemistry* by Dr. X.L. Cao noted "significant migration of BPA, or bisphenol-A, especially in hot conditions."

Some portable water is bottled in containers that include polyethylene terephthalate and may potentially leak DEHA, a carcinogen, into the water. Some other portable water bottles contain bisphenol A, which is similar to the female hormone estrogen, which some studies have linked to cancer and immune and neurological problems.

- **Don't Reuse Plastic Water Bottles**—While I recommend that you totally ditch plastic water bottles, if you remain zealously committed to them, it is best not to reuse them. Contamination problems can result from reusing plastic water bottles without appropriate washing between each use. And even with thorough washing, toxic chemicals from the plastic water bottle are more likely to break down and drift into the water inside. There have been research studies which demonstrate that the disintegration of toxins in plastic water bottles is actually accelerated by daily cleaning with hot water and soap.

- **Ditch the Office Water Cooler**—In addition to the physical strength needed to hoist up a new water cooler bottle into the tank, there is also a major health hazard for offices that fail to regularly clean and disinfect the tank. A Tufts University research study on water coolers found that "organisms from each new bottle of water adhere to a cooler's reservoir—the 'well' in which the bottle sits—and also to its hot and cold water spigots, accumulating over time and thereby boosting the bacterial count of any water that passes through on the way to a cup or glass."

- **Investigate Faucet Filters**—If the tap water doesn't taste appealing and there are concerns about heavy metals, chlorine, or other contaminants in the water supply, water filters used in a pitcher or attached to the faucet can be a viable option. Not every filter type eliminates every type of contaminant. The Environmental Protection Agency requires that community water systems provide customers with an annual water quality report.

DRINKING WATER SAFETY CANNOT BE TAKEN FOR GRANTED.

These Consumer Confidence Reports provide information about the quality of the drinking water supply. Once your review this report, you can assess what contaminants may be in play and which filter works best to address it.

- **Scrutinize Water Vendor**—Not all water delivery services are created equal, and it is important that whoever is charge of contracting a drinking water vendor thoroughly checks out the reputation and background of the company. Is the water regularly monitored to ensure it is contaminant free? Is there a help desk available to employees to call? What types of filters are used and are they appropriate for screening out the types of contaminants found in your region? Is the water delivery company a reputable business with tenure and great customer recommendations?

The U.S. EPA has established standards for tap water that "help ensure consistent quality in our nation's water supply under the Safe Drinking Water Act. The EPA prioritizes contaminants for potential regulation based on risk and how often they occur in water supplies." To aid in this effort, the EPA ensures that "certain water systems monitor for the presence of contaminants for which no national standards currently exist and collect information for their occurrence." This health risk assessment is based on measuring risks to the most sensitive of our population which includes infants, children, pregnant women, immune-compromised, and senior citizens. The EPA then sets a "legal limit for the contaminant in drinking water or a required treatment technique."

Drinking water standards in the United States are legally enforceable, which means that our individual state and the EPA can take enforcement actions against water systems that do not meet safety standards. The City of San Diego issues an annual Drinking Water Quality Report that includes important information about the water we drink.

For San Diego and other cities, you can also request a copy of your area water quality report from your water company or visit the Environmental Protection Agency at *www.epa.gov*. Invest in a testing kit and test your water in the office. These samples can be submitted to laboratories for analysis. The safety of our drinking water should never be taken for granted, and we should do everything we can to ensure our liquid "staff of life" is clean and fresh from biocontaminants.

Janice Nath is an ambience architect for Ambius, based in San Diego, CA. She can be reached through *www.ambius.com.com/janice*. This is her first article for *Facilities Manager*.

Professional Development

WRAP-UP

APPA U CLASS OF JANUARY 2013 CELEBRATES IN TAMPA

By Suzanne Healy

APPA U kicked off 2013 with above average attendance records in Tampa, Florida and delivered another successful gathering of the Institute for Facilities Management and the Leadership Academy. Colleagues from around the globe were welcomed to learn, network, and collaborate.

We are grateful to the dedicated faculty who make these offerings such a success. A special note of thanks goes to Institute Deans: **Mary Vosevich**, **Jay Klingel**, **Lynne Finn**, and **Don Guckert**; and our Academy Deans: **Glenn Smith**, **Michelle Frederick**, **Ann Jenkins**, **Shawna Rowley**, **Matt Adams**, **David Judge**, **Doug Christensen**, and **Jack Hug**. APPA also extends a special thank you to **Randy Ledbetter** and **Steve Stephens** of DTZ who hosted our Monday evening open forum titled *Gaining Approval for Your Idea(s) — Developing a Win Strategy*. The event allowed for additional networking time and possibilities.

Throughout the week, APPA U students had the opportunity to interact with experts who brought their knowledge and experiences from vast backgrounds, providing a rich environment for all attendees. A big thanks to University of South Florida's **Siva Prakash**, **Nainan Desai**, and their teams, who provided an outstanding tour for a number of attendees.

As the week drew to a close, we celebrated with graduation ceremonies for the Class of January 2013, welcoming 75 new alumni.

Kudos to the institutional leaders who supported the professional development of their staff! The professional development of any staff person must be as customizable as the individuals themselves—and APPA is here to help everyone achieve their personal, departmental, and institutional goals.

The next session of APPA U will be held September 8-12, 2013 in Fort Lauderdale, Florida. Please visit *www.appa.org/training* for more on all of APPA's program offerings.

Suzanne Healy is APPA's director of professional development and can be reached at *suzanne@appa.org*.

Academy Graduates

Amr Abdel-Azim, *Michigan State University*
Barbara Benson, *Davidson College*
Allen Boyette, *North Carolina State University*
Raymond Bryant, *Washington & Lee University*
Ally Bujacich, *University of Puget Sound*
Luis Ceballos, *Gulliver Schools, Inc.*
Alan Daeke, *North Carolina State University*
Edmond Dubois, *University of Colorado/Boulder*
Thomas Flood, *Elon University*
Edward Furnas, *Florida International University*
Brian Gillette, *Allegheny College*
Gerald Grimes, *Middle Tennessee State University*
Kim Holland, *McMaster University*
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Janice LaRiviere, *Southern Illinois University/Edwardsville*
Wilson Martinez, *Florida International University*
Alice Maxwell, *University of Maryland/Baltimore*
Gary Nellesen, *Mt. San Antonio College*
Paul Ostrander, *University of Pennsylvania/Philadelphia*
Lisa Potter, *University of Colorado/Boulder*
Aaron Wand, *Tarleton State University*

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Institute Graduates

Jessica Abbott, *University of Hartford*
Ron Bailey, *University of Nebraska/Lincoln*
Helen Bailey, *University of North Texas*
Tom Blackwell, *University of Texas/Austin*
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Cheryl Brown, *North Carolina State University*
Angel Brownell, *Bennington College*
Dennis Coakley, *University of Vermont*
David Cosner Sr., *University of Maryland*
Nainan Desai, *University of South Florida*
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Book Review Editor: Theodore J. Weidner, Ph.D., P.E., CEFP, AIA

Disasters and the unexpected

should be expected just like change is expected. This month we look at two books, one focused on general disaster planning issues, and the other on how great teams can work together to address the unexpected. In both cases, they identify important elements of success, careful thought, good planning, and teamwork.

BEFORE AND AFTER DISASTER STRIKES: DEVELOPING AN EMERGENCY PROCEDURES MANUAL, 4TH ED

Institute of Real Estate Management, 2012, 300 pages, softcover $49.95.

Emergency planning and recovery have been important topics of discussion since 2001—and before. Remember back to 1999 when we were all concerned about computer systems and clocks failing at the start of the millennium? It was all about trying to manage what were rather well-known software capabilities, and ensuring all possible contingencies were identified and addressed. Still, many of us spent time on campus watching the clocks tick rather than celebrating the new millennium with family and friends.

PROTECTING THE STUDENT BODY IS THE FIRST PRIORITY.

Then we experienced the September 11, 2001 attacks, and the focus turned to unknown threats. What kind of damage could be done by a terrorist? How could we prevent it and how would we recover? We subsequently learned that threats can also come from our students, staff, or community. Educational facility officers have responded to these and many other threats to facilities and those we serve by coordinating response plans, taking FEMA courses, and making physical improvements to our facilities.

Other threats from nature and people drive how we need to prepare and respond if we're to succeed, and provide facilities that will serve our customers. Limiting the damage done by a disaster and protecting the student body is the first priority. Then there's the general expectation that any disruption will be temporary and everything will return to normal—or near-normal services—within a day or two, so business continuity planning is essential.

While many of the subjects addressed in *Before and After Disaster Strikes* have been addressed by long-time facility officers, those new to the position (or those who haven't taken the time to develop or update their emergency planning manual) will find significant value in this book. It also has several chapters on non-education facilities that may be relevant for any facility officer.

INTO THE STORM: LESSONS IN TEAMWORK FROM THE TREACHEROUS SYDNEY TO HOBART OCEAN RACE

Dennis Perkins and Jillian Murphy, AMACOM, New York, 255 pages, hardcover $24.95.

The typical team-building book is written with the principles of team building with examples of each principle, from various teams, presented to emphasize the principle. This columnist has reviewed a dozen or more books that follow this tried-and-true format. Needless to say, one might call it a truly tired format. Fortunately, Dennis Perkins and Jillian Murphy take a different approach with *Into the Storm*.

I was gripped by the story of an ill-fated race, the Sydney to Hobart race from Australia's largest city to the remote, state capital of Hobart on Tasmania. In 1998, the 630-mile race in the Tasman Sea was

THIS IS ONE OF THE MOST ENJOYABLE TEAM-BUILDING BOOKS I'VE READ IN A WHILE.

harrowing and hero-making. Normally, a difficult race, it was made deadly by hurricane force winds and 60 to 100 foot high waves. Ultimately, six people died, dozens of boats gave up or sank, and only 40 percent of the entrants completed the race. It was the greatest loss of life in the history of the race (there were only two prior deaths in over 50 years). Despite the difficulties, a 35-foot boat with a crew of seven survived and completed the race fast enough to win a trophy. While it wasn't the fastest or largest boat in the race, and didn't have the "star power" of some of the other racing teams, it had a tenacious and well-tuned team of sailors who knew how to work together as a team and win.

The race story covers the first 60 percent of the book. Then one of the authors, in an attempt to "test" the mettle of the subject team, joins the crew of a subsequent Sydney-Hobart racing team to experience what the race is usually like. The final 25 percent of the book reviews ten strategies of successful teams, looks back at the race story, and reinforces the team-building and success references if the reader didn't notice them while reading the story. It's unconventional and effective.

While not a sailor, I found the story compelling and puts the reader into the moment. Rough seas, sea sickness, foul weather, punishing physical conditions, and stamina-sapping struggles are presented in an effective way. Simultaneously, the writers do an effective job of foreshadowing the ten principles of effective teams; one can almost read the story and forget the last 40 percent of the book—but don't.

This is one of the most enjoyable team-building books I've read in a while. It had a great story, led with it, and then built on the story to make important points. I appreciate the daring move by the author to lead with the story rather than the subject. It's effective, compelling, and enjoyable. If you have difficulty putting the book down until the race end, I won't be surprised.

Ted Weidner is senior director of project management and construction at Purdue University, West Lafayette, IN, and can be reached at *tjweidne@purdue.edu.*

Compiled by Gerry Van Treeck

Yale Locks & Hardware introduces its 5800 Series Cast Iron Door Closer. The economically priced 5800 Series combines ease of installation and use with rugged performance and clean design. The cast iron "large bore" construction of the 5800 Series makes it an excellent solution for high-frequency applications. This closer is adjustable from size 1 through size 6; consequently, it is ideal for a wide range of commercial applications. Yale's 5800 Series provides dependable functionality, with features that include adjustments for back check, closing speed, latch speed, rack and pinion operation; and a variety of arm options. To learn more about the this product and others from Yale Locks & Hardware visit *www.yalelocks.com*.

Spectronics Corporation announces the MDE-2000 Marksman™II, an ultrasonic diagnostic tool that converts and amplifies inaudible ultrasonic sound into audible "natural" sound. This tool allows the technician to "hear" even the smallest compressed air, natural gas, propane tank, vacuum, steam, and other pressurized leaks before they lead to major breakdowns. The Marksman II uses a two-tiered approach to ensure accurate diagnosis. The receiver converts inaudible ultrasonic sound into audible sound using heterodyne circuitry. Then, its unique Sound Signature Technology fine tunes the audible sound into the natural sound emitted by the leak itself. A 5-LED signal intensity indicator and audible alarm pinpoint the exact source of the problem. An Internal Noise Control (INC) feature safeguards against ambient noise. For additional information about Spectronics Corporation visit *www.spectroline.com*.

Good Day Tools has started production of its Draft Simulator, a new device invented to be used on furnaces, boilers, water heaters, draft hoods, air balancing, filter systems, clean rooms, zoning—any application that uses a pressure switch. The Draft Simulator can calibrate and test adjustable and factory-set pressure switches, procedures that until now involved manual testing. The instrument produces a sustainable vacuum pressure, allowing HVAC technicians to simulate the pressures draft inducers produce on furnaces while determining when pressure switches open and close, all without a furnace running, or the pressure switch even attached to the furnace. To learn more about Good Day Tools visit *www.gooddaytools.com*.

goCharge provides mobile device charging stations with built-in charging cords to accommodate nearly all models of cell phones, smart phones, tablets, and music players. From libraries to student unions and lounges, goCharge's free charging stations serve students at campuses across the nation as they traverse between classes, libraries, sporting events, and dining halls. For more information regarding goCharge visit the website at *www.gochargenow.com*.

CAS DataLoggers joins with T&D to announce its newest product release, the RTR-756 Wireless CO2 + Temperature + Humidity Data Logger. This self-contained wireless monitor is a flexible real-time monitoring solution for managing your CO2 levels, temperature, and humidity in schools and office buildings, testing energy-saving measures such as ventilation and air conditioning controls, use in plant research studies, and more. Cost-effective given all the parameters it measures, and compatible with T&D's popular 500 series data loggers, the new logger also includes free software. Now you can get all the benefits of T&D products in one logger featuring flexible recording, wireless communication, and battery

operation. For additional information please contact CAS DataLoggers at *www.DataLoggerInc.com*.

StayDry Systems manufactures the StayDry Shower Curtain. APPA member and inventor, Tom Bryce, began manufacturing the StayDry Shower Curtain as a home business. It has since grown to a full-time business with sales to universities, hospitals, and senior care facilities all over the world. The unique shower curtains create a reusable watertight seal against any shower wall, including combination tub/shower units. The

end results are clean, dry, and safe bathroom floors because the shower water now stays inside the shower. Some showers require longer extension shower rings and some of the newer non-lip shower stalls are using the collapsible water dam, both available from StayDry Systems. Overall great for students, conference guests, and staff. For more information about StayDry Systems visit *www.staydrysystems.com*.

New Products listings are provided by the manufacturers and suppliers and selected by the editors for variety and innovation. For more information or to submit a New Products listing, e-mail Gerry Van Treeck at *gvtgvt@earthlink.net*.

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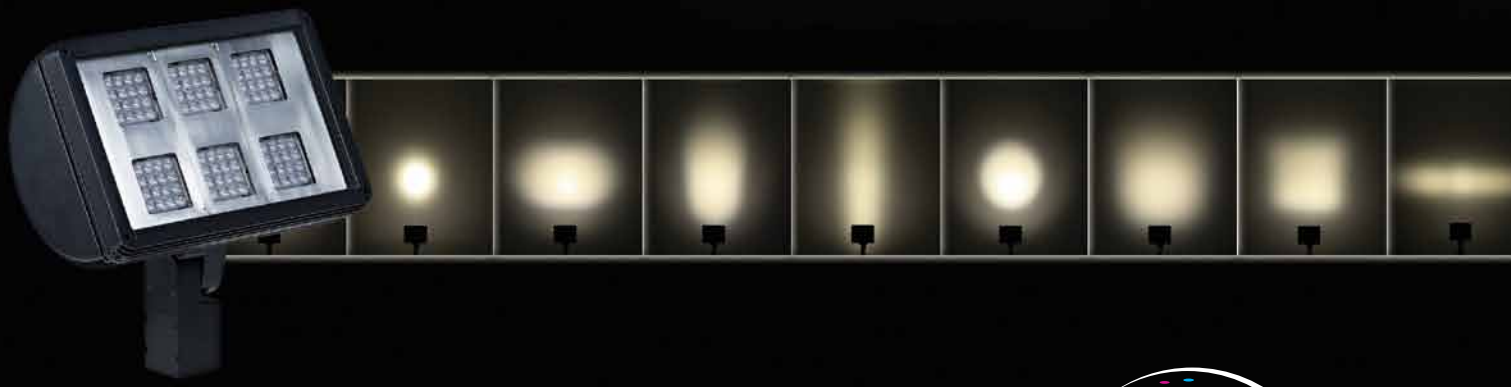

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