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MAY/JUN 2019

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+

Overdue Boiler Upgrades

Work—What is it Good For?

Leveraging ASHRAE Standards

Managing Med-Ed Facilites


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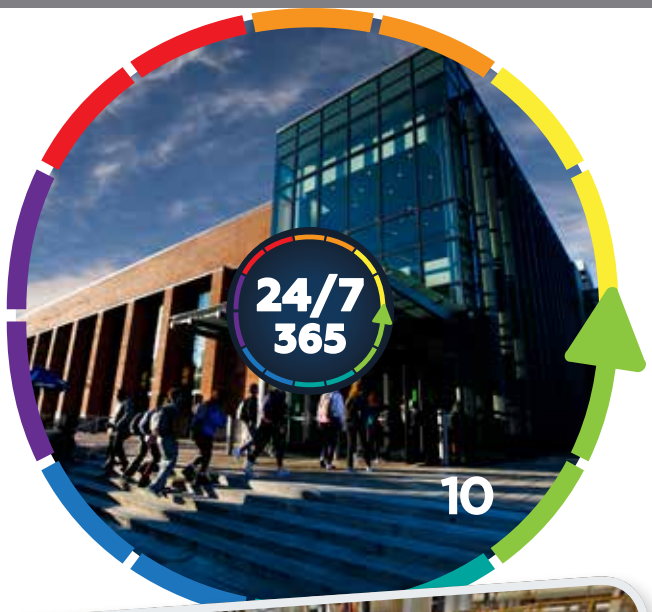

MED-ED FACILITIES

Cover photo courtesy of the University of Kentucky.

columns

Smarter, safer healthcare solutions

How high tech is supporting high touch at Nemours Children's Hospital.

Nemours, one of the nation's largest integrated pediatric health systems, is also one of the first pediatric hospitals to implement third-level patient monitoring with video verification. Utilizing the broad portfolio and open platform from Axis Communications, Nemours created a new solution for life-changing responses with pediatric care.

Watch the full story at: www.axis-communications.com/nemoursvideo

AXIS® COMMUNICATIONS

APPA's New Website Goes Live

On May 1 APPA launched its first major website redesign in eight years. We urge you to visit *www.appa.org* to see the many changes we've made to its look, feel, navigability, and focus of purpose. In addition, all pages are relational and optimized for use on a desktop, laptop, tablet, and smartphone.

The first thing you will notice is a cleaner, more logical menuing system that places APPA's programs and services in clear categories of purpose (About APPA, Continuous Learning, Library, Job Express) as opposed to being organized by APPA staff functions or departments. The homepage also adds four blue navigation boxes overlaying the slideshow photo images and providing quick links to specific areas identified by APPA members and other users as key topics of interest.

The old website used quite a lot of stock photo images, and we decided to include in the new website more photos and images that depict the campuses, people, and facilities organizations served by APPA and its members. Our call for photos from our college, university, and school members resulted in receiving dozens of fantastic photos—from traditional campus beauty shots to students at work and play to facilities employees doing their jobs—that we will draw from to update the homepage and other pages on a periodic basis. Many thanks to the institutions that sent us their photos and provided us with permission to use them on the website.

We also thank the concerted efforts of the APPA Board of Directors, the Information and Communications Committee—under the leadership of VP David Handwork—the APPA staff, and our design and website consultants for a tremendous job well done. There is much to view, read, and discover on the new APPA website. We invite your comments and look forward to serving you further.

COMING IN JUL/AUG 2019

- FM Technologies Case Studies
- Facilities Performance Indicators
- Measuring the Impact of Facilities on Student Retention

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. Founded in 1914, 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 more than 20,000 educational facilities professionals at more than 1,300 learning institutions throughout the United States, Canada, and abroad. For more information, visit us at *www.appa.org*.

Facilities Manager
1643 Prince Street
Alexandria, Virginia 22314

By Anita Dosik

APPA 2019 ANNUAL CONFERENCE & EXPOSITION REGISTRATION IS OPEN!

Denver, Colorado • ***July 15-17, 2019***

Be sure to attend APPA's Annual Conference in Denver, Colorado! You won't want to miss this exciting gathering of fellow facilities professionals and exceptional speakers! Visit *http://annualmeeting.appa.org* for details and to register.

Important Insights on Innovation Included in 2019 Thought Leaders Report

More than 40 administrators (presidents, CBOs, and provosts), campus risk managers, SFOs, consultants, and others met in Hilton Head, South Carolina for the 14th annual Thought Leaders symposium. The topics discussed were innovation and entrepreneurship.

The final report will be published and distributed at the APPA annual conference July 15-17 in Denver, Colorado.

APPA 2018-2019 Election Results

We are pleased to announce the newly elected President-Elect for APPA's 2019-2020 administrative year:

Jim Jackson
Assistant Vice Chancellor,
Faclities Operations
University of Nebraska Lincoln

Jim Jackson and other board members will take office at the APPA 2019 conference in Denver, Colorado, July 15-17, 2019. Many thanks to the Tally Committee for counting and verifying the votes:

- Al Stearns, *Chair*
- Mike Sofield

Keep Your APPA Contact Information Up-to-Date

Please help APPA ensure that you continue to receive the most relevant industry information in an efficient manner. It will take no more than a minute to check your membership profile on myAPPA (*www.appa.org/login.cfm*) to confirm or update your contact information. Should you need assistance, please contact *membership@appa.org* or call 703-542-3823.

CALENDAR OF EVENTS

APPA Events

Jun 6, 2019
Total Cost of Ownership and APPA TCO 1000, an ANSI Recognized Standard, *Webinar*

Jun 17-21, 2019
APPA/ACUI Essentials of Facilities Management Training Seminar, *Emory University, Atlanta, GA*

Jul 15-17, 2019
APPA 2019 Annual Meeting & Exhibition, *Denver, CO*

Sep 8-12, 2019
APPA U—Institute for Facilities Management, *Nashville, TN*

Sep 10-12, 2019
APPA U—Leadership Academy, *Nashville, TN*

Regional Events

Sep 16-18, 2019
RMA 2019 Regional Meeting
Banff, Alberta, Canada

Sep 29-Oct 2, 2019
ERAPPA 2019 Regional Meeting
Erie, PA

Sep 29-Oct 1, 2019
PCAPPA 2019 Regional Meeting
Las Vegas, NV

Sep 30-Oct 3, 2019
CAPPA 2019 Regional Meeting
Winnipeg, Manitoba, Canada

Oct 6-9, 2019
SRAPPA 2019 Regional Meeting
Hosted by Northern Kentucky University, Covington, KY

Oct 13-17, 2019
MAPPA 2019 Regional Meeting
Mall of America, MN

For a full listing of upcoming events, visit *www.appa.org/events*. Submit your organization's facilities-related events to *steve@appa.org*.

APPA Recalibrates CEFP Certification Qualifications to Align with Phase-Out of EFP Certificate

APPA has changed the qualification requirements for its Certified Educational Facilities Professional (CEFP) credential to positively align with the phase-out of the Educational Facilities Professional (EFP) certificate effective April 1, 2019. Moving forward, individuals wishing to take the CEFP certification examination must only demonstrate a combined eight years of education and experience. (Previously, a combined 15 years of education and experience were required to take the exam.)

As APPA makes the CEFP certification more accessible, the EFP certificate will be phased out, and EFP certificate holders will need to take the next step to full CEFP certification. To help them achieve this milestone, APPA is offering EFP certificate holders one year to participate in the online prep course and/or take the CEFP examination at no cost.

To find out more information about the CEFP credential and see how you can qualify, please visit us at *https://credentialing.appa.org.*

2017-2018 FPI Report Now Available

The 2017-2018 Facilities Performance Indicators (FPI) report is now available to help you assess, measure, and lead your institution to success. With over 300 learning institutions now participating, the report will empower you with the vital data, statistical references, and reporting tools needed to measure operations and performance. The report will also help identify capital asset realities and help you lead a successful facilities strategy that supports your institution's mission and vision.

To access the report, log in to your myAPPA account page, go to the myResearch heading, and under it, click on the "FPI Report Access" link.

The report is free to APPA members who participated in the survey, or it can be purchased:

- APPA Member/Nonsurvey Participant Report: $500
- APPA Nonmember/Survey Participant Report: $895

For additional information or to purchase the FPI report, please visit *http://www.appa.org/research/FPI/index.cfm.* Be watching for news on FPI 2.0, set to release in July.

Next Institute for Facilities Management and Leadership Academy—Nashville, TN

September 8-12, 2019
Sheraton Music City Hotel
Nashville, TN

Institute for Facilities Management. The Institute is offered twice a year, and runs Sunday through Thursday evening. The Institute curriculum is composed of four core areas:

1. General Administration & Management
2. Maintenance & Operations
3. Energy & Utilities
4. Planning, Design & Construction

Institute students select one core area that will be the focus of their classes for that week. Morning classes consist of required courses centering on the core area selected. Afternoon classes will be electives chosen by the student and may be a combination from any of the four core areas.

Upon completing the week-long session, students will receive a certificate of completion designating their core area of study and 3.0 continuing education units (CEUs).

In order to graduate from the Institute, students must complete all four areas. Students are awarded a plaque recognizing their achievement upon successful completion of the program.

Leadership Academy ***(September 10-12).*** The Academy is a unique experience that will expand your ability to be an effective leader and promote the concepts and skills you need to be a life-long learner, not just professionally but personally as well—it should be a "game changer."

The Academy is designed as an adult learning experience. This means that you will be asked to participate in many activities, including organizing a cohort group, presenting the group's thoughts and ideas, leading a discussion on a given topic, listening to content delivery, expressing new solutions to old problems, and more. This style requires that you participate, but more importantly that you grow as a leader. You will have the same set of facilitators for the entire week, who will be there to monitor and to present the skills and knowledge needed at each level of learning. They will help you learn, but the real learning is up to you.

The Millennial Myth

By Eva Chase

Since graduating with my bachelor's degree in 2016, I've been the youngest staff member in every office I've worked in by, let's just say . . . more than a few years. My current position as sustainability coordinator at Black Hills State University (BHSU) is no exception.

When I first entered the full-time workforce at 21, I saw my youth as something that I needed to overcome. If you've ever read a news article on Facebook, you must know that all millennials are lazy, entitled, and single-handedly killing thousands of industries ranging from breakfast cereals to fabric softener. Due to this perception of my generation, I started out attempting to conceal my age for fear of losing respect (which didn't work because I still look 16). However, I quickly realized I was looking at my age as a limitation, when instead it could be my most valuable asset. I was neither lazy nor entitled. Like most of my peers, I was the opposite.

My peers and I place a high value on both formal and informal education, we're passionate about our career fields, and we're excited by change and helping an organization move into the future. All of these characteristics are beneficial to any organization or company and make millennials like myself a great hire. Apparently, the facilities services hiring team at BHSU agreed.

In my current position with BHSU Facilities Services, I advise three student organizations and supervise 8-10 student employees. Yes, I sigh when I get asked what my major is on a weekly basis, but I still see my age as one of my greatest attributes, and one that helps me to be more effective when working with these students. It was just a few years ago that I was in their shoes. I remember the stress and chaos of being a full-time student, but I also remember what I gained from being involved on campus outside of class.

In addition to learning your field, college is also a time to learn how to be successful in a workplace and as part of a team. When you bring student workers into your department or advise a club, you teach them something they can't learn in a classroom, but which is just as important as any classroom experience. You don't have to be a professor to have a huge influence on a student's life and career. I truly believe I've made an impact on the lives of the students I've had the privilege of working with so far, and my relatability as a millennial has helped me do that.

In addition to my age being an asset when work-

ing with students, it has brought a different point of view to our team. My mindset and experiences as a millennial truly set me apart as a facilities team member, and that becomes apparent when I'm the youngest person in the meeting by 20-plus years. Working at a smaller university in an even smaller town, you find yourself surrounded by colleagues who have been a part of the university for many years. These coworkers, their commitment to their jobs, and their knowledge of the university's history are an invaluable resource, but I often hear them say things like, "Well, that's the way it's always been done." This is when I step in to say, "That doesn't mean it always has to be done this way." Because a solution may have been the best one in the past doesn't mean there's not a better one now. I'm not referring to change for the sake of change, but to change for the sake of efficiency and progress. When your workplace lacks diversity, it can also lack the kinds of discussions that cultivate creative solutions.

The "millennial myth" has held many of my generation back from getting a position we were qualified for or a promotion we deserved—but the fact of the matter is it's just that, a myth. According to a Pew Research Center analysis of U.S. Bureau of Labor Statistics data, millennials will make up nearly 50 percent of the U.S. workforce by 2020 and 75 percent by 2030. In a survey of millennials published by the University of North Carolina Kenan-Flagler Business School, 52 percent said "opportunities for career progression made an employer attractive," and 22 percent said "training and development [is] the most valued benefit from an employer." Furthermore, the same survey revealed more millennials prioritized "meaningful work" over high pay.

Millennials are our next workforce leaders. We're passionate and dedicated to our careers, and we want the opportunity to work with older generations and learn from them. Give us the opportunity to bust this myth.

Eva Chase is sustainability coordinator at Black Hills University in Spearfish, SD, and can be reached at *eva.chase@bhsu.edu.* This is her first article for *Facilities Manager*.

Healthcare student photos courtesy of Thomas Jefferson Universtiy.

By Mark Crawford

Managing Med-Ed Facilities *is a* 24/7/365 Business

"Med-ed" likely has different meanings for different academic institutions. Med-ed facilities have a medical component, such as a patient-centered hospital or clinical space. Medically related educational facilities include teaching colleges for nursing, pharmacy, medicine, public health, and health sciences, as well as their related laboratory spaces for education and research. In most cases, med-ed facilities provide a continuous 24/7/365 environment that supports patients, families, and medical staff.

The term "med ed" continues to evolve. Initially, it referred to the education and training received at a college or university to become a medical doctor or an osteopath. Today it includes schools that deliver accredited programs for nurses, nurse practitioners, and physician assistants. The med-ed field will continue to evolve, especially as more teaching programs fall into the range of "allied health" that require clinical rotations.

Med-ed facilities typically have many of the same facilities needs that traditional campuses have. However, med-ed requires a greater focus on safety and regulatory compliance, as well as urgency and timeliness in delivery of services. Preventive maintenance is essential for ensuring that life-safety regulations are met. Med-ed facilities also have more complex IT needs, including sophisticated research facilities, vivariums, and other medical spaces, as compared to standard classroom space.


Thomas Becker

"The portfolio of services for med-ed has different inventory," says **Thomas Becker**, associate vice president for academic and research facilities at Thomas Jefferson University (Jefferson) in Philadelphia, Pennsylvania. "University facilities routinely support very large events and sports competitions, with thousands of young adults in attendance. Hospitals don't necessarily have large crowd events, but they do tend to have urgent response capability, heliports, and more systems with higher levels of sophistication and testing verification."

Even though med-ed facilities are unique, their facilities managers must still interact with other facilities management (FM) departments on campus, sometimes sharing labor and resources.


James Harrod

"My focus is on our hospital campus, clinics, and business locations," says **James Harrod**, business and operations manager for UW Health, the health system for the University of Wisconsin Madison. "And although I do not have a focus on campus facilities, I must still work very closely with the campus because physicians, researchers, and students are in both hospital and academic locations."

Administratively, med-ed is often more complex to manage, with a combination of solid-line and dotted-line reporting structures. Workforces are sometimes even shared between the medical pillar and the academic/research pillars.

For example, at Jefferson, FM has campus, trade-specialty, or building-asset assignments, much like at a typical university campus, and ultimately has line-reporting responsibilities to the senior vice president of corporate facilities. However, many staff are also part of mission administration teams that focus

Courtesy of UW Health Marketing & Communications

UW Health–Main Campus (University of Wisconsin Madison).

on the different pillars of the medical, research, and university enterprise. "These dotted-line responsibilities are critical and typically have a more timely impact on the ultimate customer," says Becker. "Planning, design, and construction supports the medical, research, and university pillars, also reporting to the senior vice president, but may have staff on full-time assignment within remote Jefferson campuses and medical sites."

In addition, dual reporting is not exclusive to facilities. Medical faculty work as practicing physicians with reporting relationships aligned with their specialties, and then may report academically to a different administration.

REGULATORY COMPLIANCE

The biggest difference between med-ed and traditional ed is found in the regulatory oversight. Med-ed facilities undergo regular surveys by The Joint Commission and the Center for Medicare & Medicaid Services (CMS), which can be a shock to any facilities manager moving from an educational university to a med-ed university. "The requirement to comply with these regulations, plus a host of others, exceeds anything I ever encountered during my previous experiences with universities," says **William Elvey**, APPA Fellow, past APPA President, and senior vice president of facilities and real estate for Children's Health, the pediatric teaching hospital affiliated with the UTexas Southwestern Medical Center in Dallas.

William Elvey

For example, at Jefferson, regulatory compliance responsibilities include ensuring facilities comply with the requirements, standards, regulations, and laws of the local city/township/borough, the Pennsylvania Department of Health, the Association for Assessment and Accreditation of Laboratory Animal Care, the CMS, and The Joint Commission, as well as federal regulations including the Americans with Disabilities Act (ADA).

When requirements overlap, facilities managers try to comply with the most stringent one. For example, when considering the Life Safety Code, depending on the age of the facility, timing of the project, and the authority having jurisdiction (AHJ), "It is often difficult to determine which requirement we have to comply with," says Elvey. "For example, the American Society for Healthcare Engineering [ASHE] has even published a 43-page document that provides healthcare facility managers with a side-by-side comparison of the 2015 IBC, 2018 IBC, NFPA 101-2000, NFPA 101-2012, NFPA 101-2015, and NFPA 101-2018. In other areas, The Joint Commission enforces some codes that the CMS folks do not recognize, and so on."

FM software tools can be beneficial for keeping track of regulatory requirements and testing. "For our inspections, we utilize a product called AkitaBox, a facility management tool that allows us to report on everything from annual fire door inspection to monthly generator test and monthly fire extinguisher tests," says Harrod. "This includes weekly

tests on drench showers and daily inspections to confirm pressurization of spaces for infection-control purposes. In addition, anytime we perform work that may cause dust, we complete an infection-control risk assessment."

24/7/365

Failure of critical equipment can create life-and-death situations in med-ed settings. Therefore, preventative maintenance is essential for life-safety areas. Because many of these areas are patient-centered, facilities departments may choose to do a considerable amount of preventive maintenance work during off hours.

"Patients always come first and may very well drive when facilities work can be completed," says **Mary Vosevich**, past APPA President and vice president for facilities management and chief facilities officer for the University of Kentucky in Lexington. "Failure in medical facilities where research is being conducted, or patient care is taking place, is unacceptable."

Mary Vosevich

For example, failure of elevators that are used for transporting patients could have life-threatening consequences. Flooding caused by a pipe failure in the emergency department could result in patients being diverted to other areas, wasting valuable time. "Hence it is important to have a long-term and continuous preventive maintenance plan in place that includes schedules and resources to make certain these scenarios do not occur," adds Vosevich.

Medical research facilities are increasingly sophisticated, especially within vivariums or biological research labs. The highly specific environmental conditions they require are generally more stringent than those for most universities, or sometimes even hospital areas. System redundancy is critical. "This is where the Association for Assessment and Accreditation of Laboratory Animal Care [AAALAC] comes into relevance," says Becker. "The loss of medical research animals resulting from facilities failure can be avoided with great forethought and care. Aside from the lives of the animals, equipment malfunction could affect years of research, waste millions of dollars of research money, and even affect the health of the researchers. To avoid this, 24/7/365 high-precision monitoring equipment is required for these spaces."

AN EVOLVING HEALTHCARE LANDSCAPE

The changing environment of healthcare is a constant challenge, especially when it comes to technology. "I have found healthcare to be far more IT-intensive for med-ed administrative and operating systems, and those systems to be far more integrated across our systems, than for the universities I previously worked for," comments Elvey.

Cybersecurity is also a major concern, especially regarding the strict privacy regulations now in place concerning patient healthcare records. In addition, due to the rapidly changing technology trends in healthcare, med-fed facilities are constantly replacing, upgrading, and installing new equipment across their systems, sometimes even before the current equipment reaches its normal end-of-life.

The only way to keep up with the many changes going on in the healthcare industry , notes Elvey, "is to stay as active as possible in professional associations such as CHA and NFPA, attend workshops and conferences, read industry trade journals, and connect with colleagues at other healthcare institutions."

Mergers and acquisitions in the field of healthcare often change the mix of med-ed facilities, and therefore change compliance requirements. Trying to develop revised standards, policies, and procedures for use across a new entity can be daunting. For example, Thomas Jefferson University has expanded from being a primarily upper-level medical university and large medical school with extensive research facilities and three hospitals located in Philadelphia, to 14 hospitals spread across two states.

It has also merged with Philadelphia University, a comprehensive undergraduate and graduate university with multiple majors, sports teams, and remote campuses in two states. Such a high level of activity in just a few years has necessitated significant changes to computerized maintenance management systems, space inventory, project management, compliance, parts procurement, and financial systems.

Courtesy of Chilren's Health

Children's Medical Center, Dallas, Texas.

Courtesy of University of Kentucky

Student center, left, and alumni gym, right, at University of Kentucky.

As part of the massive restructuring of multiple corporate entities, the university decided to centralize services to leverage administrative expenses.

"Facilities management is a portion of that," says Becker. "Therefore, methodologies for standardization and ongoing improvement of facilities operations and maintenance, planning design and construction, and compliance are rapidly being implemented. Part of the initial planning for this transition was developing a corporate-wide, service-level agreement, which included commitments to APPA service levels for maintenances and custodial services in the academic and research facilities, as well as prioritization levels that align with hospital expectations and service levels according to our healthcare-quality consulting firm's standards."

RUNNING FACILITIES LIKE A BUSINESS

Yet another challenge is the requirement to operate med-ed facilities more like a business rather than a not-for-profit. For example, Children's Heath reviews its financial numbers daily. "As a senior vice president," says Elvey, "I report directly to the CFO and am a member of the executive leadership team, which meets bimonthly, including three off-site strategic planning sessions a year."

Children's Health is highly streamlined from an operating and governance standpoint, which translates into quicker decision-making and execution of projects than most educational institutions could manage. Because it operates as a health system instead of a large public research university, Children's Health can plan, design, and construct a large-scale, complex healthcare capital project in two to three years.

For traditional-ed universities, the complete life cycle for a similar capital project, from planning and budget development to approval by the university, governing boards, and the state, and through design and construction, could take 10 years or more.

SAFETY AND SECURITY

Although all colleges and universities emphasize safety and security, med-ed facilities maintain a deeper focus on quality of healthcare delivery (i.e., patient safety).

Thorough, top-notch infection-prevention and control systems are paramount in hospital settings, especially in pediatric healthcare. For example, all planning, design, and construction at Children's Health, as well as operations and maintenance activities, are carried out with this directive in mind. To reduce the risk of hospital-acquired infections (HAIs), all renovation and construction projects in patient areas are conducted under barricades and in a negative pressure environment to prevent any possible contaminants from escaping the project site.

"On a college campus in an educational setting, this level of attention was usually only reserved for certain activities such as asbestos abatement," says Elvey. "I have rarely experienced this level of concern on a traditional college campus."

PREPARING FOR THE FUTURE

According to Transparency Market Research, the medical education market is expected to reach $38.4 billion by 2024, driven by an expanding patient base, medical technology innova-

Courtesy of Thomas Jefferson University

Jefferson facilities leadership team. From left, Ed Sampey, Tom Becker, Doug Pastore, Kevin Donahue, Joe Byham, Frank Daly, Randy Hainas, and Clayton Mitchell.

tions, and the development of new or hybrid medical fields or specialties. This will increase the pressure on med-ed facilities to keep pace, especially as job descriptions merge and management responsibilities overlap.

Harrod believes an APPA/ASHE collaboration has considerable potential to improve med-ed FM in the future.

"There are academic medical centers where the academic senior facilities officer is going to APPA, and the hospital that sits on the campus, and is associated with the campus, is sending its SFO to ASHE," Harrod says. "At Wisconsin, the hospital is one of the larger customers from a utility standpoint; it is critical to have a great working relationship with the University of Wisconsin. Although the UW leadership team works hard to keep the hospital informed regarding utility services, other universities may not have this relationship in place."

A collaborative effort between APPA and ASHE could help members in both associations improve the quality of the services they deliver. Credentialing is available through both organizations. As the med-ed landscape continues to evolve, collaboration between APPA and ASHE to develop med-ed-specific programming could be highly beneficial to each organization.

A well-attended med-ed roundtable at the 2018 APPA Annual Conference in Washington, DC, recommended the following action items:

- Build a listserv or online communication cohort group within APPA membership of med-ed associated campuses to facilitate dialog and networking.
- Reach out to some of the group leadership contacts in ASHE and see if there are collaborative opportunities. This has already started through APPA's Facilities Performance Indicators survey, which is one way that directors of both organizations can help develop consistent benchmarking.
- Perform a gap analysis between the associations to identify collaboration opportunities for development and training.

A follow-up med-ed roundtable will be part of the APPA 2019 Annual Conference, to be held July 15-17 in Denver, Colorado. Members who are interested in participating in this cohort group may contact Mary Vosevich at *mary.vosevich@uky.edu* or Tom Becker at *tom.becker@jefferson.edu*.

Mark Crawford is a freelance writer based in Madison, WI and can be reached at *crawfordliterary@gmail.com*.

FACING THE NEED FOR Boiler Upgrades

By David Bohn

Upgrading or replacing a boiler system presents one of the most daunting and expensive challenges a large facility can undertake. When the time comes—whether the current system is outdated and inefficient or whether it fails outright—facility management must take the time to fully understand the process in order to set campus goals and make the right decisions to fulfill their energy and efficiency needs. Currently, a substantial number of colleges and universities, as well as over 1,200 Veteran's Administration (VA) medical center campuses, are undertaking system overhauls like this.

These system upgrades are driven primarily by environmental concerns. Most of these facilities will need to update their equipment, but some will require a full-system replacement. It's a huge undertaking—but most administrators believe that the long-term savings will make the effort worthwhile.

WHY MAKE THE CHANGE NOW?

One of the driving factors in making this change right away is regulatory. California, New Jersey, and Texas have implemented air-quality standards that will not be met by older boiler systems—boilers in these states must be upgraded or replaced.

These old systems often used technology that sacrificed environmental safety in favor of cost savings. Some systems incorporated metal mesh burners, which utilized filters that clog easily. The gradual clogging of air filters leads to less excess air, which leads to higher nitrogen oxide (NOx) emissions. NOx emissions are a combination of nitric oxide (NO) and oxygen. NO is the result of fuel combustion and alone is not considered hazardous; however, combined with oxygen, it is the source of fog, acid rain, and ground-level ozone, which has been linked to myriad health issues. And while some other systems might have utilized technology to reduce overall NOx, these systems had increased electricity costs.

A second reason for a system upgrade, therefore, is to address these cost concerns. Today's upgrades do not require air filters, which used to add to operation costs. Upgraded systems also offer quick-change, dual-fuel capabilities, switching between gas and oil firing in less than three minutes. This saves on service costs, since multiple people are no longer needed to make the changeover. The greatest cost reduction, however, is in the demand for electricity; upgrades can reduce electric consumption up to 60 percent.

One way to realize a cost savings is by employing a system that allows one to adjust the output according to the demand. This adjustment is achieved via what is called the unit's "boiler turndown ratio," which is the ratio of the maximum heat output to the minimum heat output at which the boiler will operate both efficiently and controllably. As the desired temperature/pressure point is reached, the heat source is turned down, and if the temperature/pressure falls, the heat is turned up.

In large campus applications, which require boilers to operate at a low proportion of their maximum output, a high turndown ratio is desired, and that can be achieved with modern upgrades. Traditional burners using fiber metal mesh provide a 3:1 turndown; however, with recent advancements in the field, there are now systems that can provide a 9:1 turndown or higher depending on NOx requirements. These systems can achieve ultralow NOx emissions without the use of flue gas recirculation (FGR).

Monitoring panels and new boiler at the VA Medical Center in Erie, Pennsylvania.

Photos courtesy of Preferred Utilites Manufacturing

In addition to the cost savings realized through a 9:1 turndown, there is another benefit to upgrading, which is the reduction in required maintenance. Not only are multiple people no longer needed for a dual-fuel changeover, but operating and monitoring the systems are also simplified. Older systems require constant maintenance to ensure fuel efficiency and emission control. For example, many older systems include jackshaft linkage. Due to the complexity of these systems, they require constant fine-tuning and maintenance by highly skilled operators. Maintenance of an upgraded or new system is far less complex.

Newer monitoring equipment also means fewer people are needed for hands-on examination of the system. Typically, with an older system, there was a boiler in each building—and that meant someone needed to be on location to monitor those systems. The ability to house the entire system in one location, or to upgrade the system to monitor it from one location, results in lower maintenance costs.

CAMPUSES MAKING THE CHANGES

Higher education is becoming a competitive industry and, honestly, who chooses a college or university because of how new the boiler equipment is? The utility plant is seen as a cost, and universities generally choose to invest in new buildings or facilities that will help them attract students. But with environmental awareness now a prominent part of the international discussion, universities continue to see and leverage the value (both economic and otherwise) in going green. Here are a few examples:

- A small, elite liberal arts college in Duchess County, New York, was working with old boilers that essentially could not fire. To fix the problem, the college chose new burners that were compatible with their old boilers, which saved a great deal of money, since they didn't need to replace the whole system. They also replaced their vacuum condensate system for further modernization and efficiency. They are now planning to buy a second burner and are interested in a solution that burns liquid wood.
- A prestigious medical school outside of Boston invested in new burners. Their solution provider helped them with reliable low life-cycle cost/best-value payback on their low-pressure steam boilers by providing three 800-horsepower (HP) burners and a feedwater system. The new burners use natural gas and No. 2 oil, and now the school is actively considering carbon-neutral fuels.
- The campus heating plant main boiler at a large public-college campus in upstate New York suffered from several crippling issues. Working with a vintage 600-HP steam boiler, the burner had a triplex-nozzle system that was an issue from day one. The burner was low-fire, disastrous and unrepeatable when cycled, and caused uneven fires from the three nozzles, which would not hold a tune-up and constantly needed cleaning and adjusting. Only one person in the boiler room could keep it running for more than a week. The college went with a proven installer who recommended a solution that holds a tune-up and remains stable with cycle repeatability in the lower firing ranges.
- A medium-sized Christian college in Providence, Rhode Island, was interested in going far beyond Environmental Protection Agency (EPA) requirements in order to reduce their emissions

and maintain their electrical and combustion efficiency. They selected a solution to achieve the best of both worlds: 22-ppm NOx on two 900-HP burners with natural gas and No. 2 oil, with new combustion controls on both burners/boilers.

- A small private college in central Massachusetts was provided a new 600-HP burner to replace an old boiler that was previously fired by a burner from a company that went out of business a few years ago. The college also selected new combustion controls. Before this, they had been shut down for a few years and faced an unreliable boiler plant. They chose fuels that were readily available and may consider other options as they continue to invest in infrastructure.

VA MEDICAL CENTER CASE STUDY

The boiler system at the VA Medical Center in Erie, Pennsylvania, had been in place for three decades and required a complete replacement. In order to achieve the most impact with this important project, the center built an entirely new boiler plant from the ground up.

The engineering team at the VA determined that the existing system had met its life span, and they wanted to replace it with the latest technology. Any short-term replacement would have simply been a bandage. They realized, however, that a project of this magnitude would take time to do properly. The team selected a project management firm to handle the entire project, based on their central-plant expertise and track record at other healthcare facilities.

Based on the campus steam load, the team determined that the replacement equipment would consist of two 400-HP boilers and one 200-HP boiler. Installation of the new boiler system took four months. From the ground up (including the new construction), the work on the project took 14 months to complete.

The center's new plant will deliver at least a 60 percent reduction in electricity consumption, which will be accomplished using a variable-frequency drive. This technology can run with the fan speed at a lower rate; for example, changing the power from 60 Hz to 30 Hz speed can cut the horsepower eightfold. Therefore, a 400-HP system would be cut to 60 HP. According to the project management firm, "Most systems can go from 60 Hz to 40 Hz easily. We chose a system that can efficiently go all the way from 60 Hz to 15 Hz for additional savings."

Fuel reduction provides cost savings over the life of the new system. Newer boiler systems can offer a savings of 2 to 5 percent. This means that one 400-HP boiler with a fuel cost of $500,000 annually can save between $10,000 and $25,000 a year. The new Erie VA plant, with its two 400-HP boilers and one 200-HP boiler, will save the hospital between $25,000 and $62,500 in fuel costs annually.

IS IT TIME FOR AN UPGRADE AT YOUR FACILITY?

A boiler-upgrade project like the one undertaken at the VA Erie Medical Center is clearly something that takes significant time and money to complete. But the center's management determined that the expense and effort would pay off in the long run. Could it be time for you to look at a similar project for your facility? Here are some points to consider when making your decision.

Sustainability

In large facilities, sustainability is sometimes neglected when considering boiler systems. Facilities like college campuses often rely on older boilers and choose the bandage approach of patching and maintaining them out of necessity—but this method is not sustainable. Upgrading to a new boiler is the best option for long-term, sustainable improvement.

Sustainability also refers to the environmental impact of a system. With ever-changing state requirements, it is important to choose a system with enough flexibility to face these new demands as well as future ones.

Fuel Efficiency

To adequately meet the heating- and energy-load demands of healthcare facilities, old boilers burn an inordinate amount of fuel. New boilers bring added efficiency and substantial fuel savings. There is also much being done in the realm of alternative fuels for boiler systems. Biofuels and liquid wood are two segments of the alternative fuel market that are making great strides.

Operation and Maintenance

New boilers are streamlined to operate more smoothly and efficiently than old boilers, which can be challenging to operate and maintain. The older boilers often take much longer to heat up, and they are often kept running to meet heating needs. New boilers are designed to heat up quickly and can be adjusted to handle variable loads in order to ensure less energy consumption.

When considering an upgrade or replacement, no matter what the reason may be, all factors of the operation need to be addressed in preparation for a system shutdown. A project of this magnitude, from the initial bid process to completion, will require a minimum of several months (for an upgrade) up to a year or more (for a complete boiler replacement). The impact of this change, and thus the importance of the decisions made during the process, are the reasons why so many campuses are carefully reviewing their future energy options.

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WORK—What's It Really Good For?

By FRED GRATTO

Many years ago, Andrew Carnegie, the famous American steel maker, observed: "The average person puts only 25 percent of his energy and ability into his work. The world takes off its hat to those who put in more than 50 percent of their capacity and stands on its head for those few-and-far-between souls who devote 100 percent."

I thought of this recently when I joined several others for a community service project. The plan was to paint a house and a little garage nearby. The morning was hot and sticky, and the painting took longer than I expected. After a few hours, I thought we were done so I started to put the tools away. As I walked around to let everybody know we were almost ready to go, I noticed no one had painted the back of the garage that faced a narrow alley. When I asked about this, the college students said they didn't bother to paint it because they thought no one could see it from the house. That was accurate enough, I guess, but I pointed out that anybody who drove down the alley would see it, and so would the person who lived next door. I mentioned that they should have done their best because the paint job mattered to someone. But they hadn't shown up to hear a speech, so I only made one more point: It's important to faithfully handle both big jobs or small tasks, even ones that may go unnoticed.

I wasn't a name-dropper that morning so I didn't mention Martin Luther King Jr., but I could have because he knew the value of work. He said, "If a man is called to be a street-sweeper, he should sweep streets even as Michelangelo painted, or Beethoven composed music, or Shakespeare wrote poetry. He should sweep streets so well that all the hosts of heaven and earth will pause and say, 'Here lived a great street-sweeper who did his job well.'"

Not everyone has this lofty perspective on work, of course. Nonetheless, by way of words and example, leaders can enhance their organizations by helping people learn to regard work as an opportunity and a blessing.

10 TRAITS OF PEOPLE WHO LOVE THEIR WORK

Work is one of the best things in the world. We're all better off working, in spite of what Tom Petty said: "It just seems so useless to have to work so hard and nothin' ever really seems to come from it" ("Here Comes My Girl"). I don't agree with Petty, because lots of good comes from work. The following are some common denominators among people who thrive on the job:

1. *Attitude . . . being mindful of what a good one does for you*

When the famous architect Frank Lloyd Wright was 83, he was asked which of all his great works he considered his masterpiece. His reply: "My next one." Even though he had been designing tremendous homes for many years, he knew he could do better. With a humble attitude like this, you'll always do good work. Actor Harrison Ford expressed a similar view: "I realized early on that success was tied to not giving up. Most people in this business gave up and went on to other things. If you simply didn't give up, you would outlast the people who came in on the bus with you." There is a lot of truth in the notion that "it takes years to become an overnight success."

2. *Awareness . . . of all the things you get from a job other than money*

Historian Charles Kingsley observed that we learn a lot of life lessons on the job: "Thank God every morning when you get up that you have something to do which must be done, whether you like it or not. Being forced to work and forced to do your best, will breed in you temperance, self-control, diligence, strength of will, content, and a hundred other virtues which the idle never know." A paycheck won't give you any of these things. Your job, not your money, is more likely what gradually changes you most over the years. Consider this assertion from critic John Ruskin: "The highest reward for a person's toil is not what they get for it, but what they become by it." Here are some characteristics you might acquire or improve because you go to work:

a. Physical Stamina. It takes a lot of effort to get up every morning and work hard every day. Because you keep moving, you increase your ability to keep moving.

b. Emotional Stamina. You learn to carry out the responsibilities of your job without becoming overwhelmed. You learn how to recover from setbacks quickly, and you learn how to get along with people.

c. Desire. You acquire and develop an inherent commitment to influencing people, processes, and outcomes to accomplish organizational goals. You learn a lot of "want-to" at work.

d. Empathy. Diversity is important, so it's helpful to develop an understanding of the values and perspectives of others. We need to know about other cultures, beliefs, and traditions. This happens most often at work.

e. Prudence and Decisiveness. You learn when to act and when not to act. You learn to consider all the facts relevant to a situation before making a decision. At work, you grow out of vacillation and procrastination.

f. Self-Confidence. Training and experience develop an assurance that you can handle the demands and challenges of a job. You learn that those who display a lack of self-confidence soon sink.

g. Dependability. You learn how important it is to do what you say you are going to do, and be where you say you are going to be. People need to know they can count on you, no matter what.

h. Responsibility. You learn that whatever you are charged to do, it is your duty to get it done. You learn that you can delegate tasks, but you can never delegate responsibility. By way of accomplishing things in the face of challenges, you acquire courage, resolve, and credibility.

3. *Confidence . . . evidenced by security and determination*

There are lots of skills needed to succeed at work, and confidence might be at the top of the list. My father often told me that confidence needed to be one of my strongest assets. Teddy Roosevelt offered a similar perspective long before my father thought of it: "When you are asked if you can do a job, tell 'em, 'Certainly I can!' Then get busy and find out how to do it." Maybe, just maybe, when we tell ourselves we can't do something, it's just an excuse we have made up. My father told me, "Freddy, you're gonna have two lives. The one you got, and the other one you'll make." He told me to work harder than anybody else—*he* sure did. He taught me of this healthy perspective from

Teddy Roosevelt: "I am as strong as a bull moose, and you can use me to the limit."

4. ***Initiative . . . being a self-starter with lots of gumption***

We don't hear much about gumption anymore, but most of us still know what it is. It's internal motivation, showing the inclination to do things without having to be told or reminded. Somebody observed, "Too many people are ready to carry the stool when the piano needs to be moved." There's some truth to this, and that's why we need more gumption than ever these days. I've noticed that people who have their fair share of it plan ahead and stay alert for opportunities to help. At work, when a person with gumption sees something that needs to be done, they do it.

People with gumption don't say, "I didn't know" or "It's not my job." People with gumption choose difficult jobs because progress and satisfaction are found in challenges. People with gumption have energy that rubs off on others. People with gumption start strong and finish strong. "Today's greatest labor-saving device is tomorrow," as President Woodrow Wilson once said, but don't use it. Get started—do it now. Don't wait to do what's next.

5. ***Persistence . . . sticking to your goal, no matter what***

Success in most endeavors is the result of small steps in the right direction, not a consequence of one big stroke of luck. You can't earn a college degree in just one semester. Accomplishing anything is often just a matter of hanging on over the long haul. Arriving at a desired destination is like going down a toll road. If you keep paying the fee, you can get anywhere you want to go. Persistence is amazing stuff. That's how the snail reached Noah's Ark, according to the famous preacher Charles Spurgeon. Did you know that Theodore Geisel, otherwise known as Dr. Seuss, was rejected by 23 publishers before he found one willing to take a chance on him?

6. ***Teamwork . . . encouraging, supporting, and helping others***

I went to a county fair a few summers ago and saw a horse-pulling contest. As I recall, one horse pulled a sled that weighed 3,000 pounds. I thought that was quite a lot until I saw the winning horse pull nearly 4,000 pounds. When that contest was complete, both horses were hitched to a sled to see what they could do. Together, they pulled almost 9,000 pounds, but individually, they only pulled a total of 7,000 pounds. That's a 2,000-pound improvement—and we can make a similar difference at our jobs when we work together. My brother and I learned this a long time ago; when we were kids, we discovered that we could walk forever on train tracks and not fall off, if we reached across and held hands.

7. ***Enthusiasm . . . taking affirmation and excitement to work***

In high school I had a summer job loading watermelons into big trucks. It was hard on my back. Some days after work, I would stop

at my grandmother's house for a big glass of sweet tea. While there, I often complained about my job. One day, tired of my whining, she told me something like this: "Make the best of it and be all there. In every situation, give your best and you'll be blessed with other opportunities." Maybe she heard that perspective from President Harry Truman, who said, "I studied the lives of great men and famous women, and I found that the men and women who get to the top were those who did the jobs they had in hand, with everything they had of energy and enthusiasm and hard work." Enthusiasm is the most special elixir because it makes work gratifying and fun. With it you can accomplish just about anything.

8. *Passion . . . pursuing a mission that captures your interests and energy*

Indiana University's former basketball coach Bobby Knight once proclaimed, "There are no office hours for champions. The more I want to get something, the less I call it work." I like this perspective, because most people yearn to do something that really matters. In fact, here's what I know: We're all the same. All of us want three things: to be liked, to be respected, and to do work that matters. If you think I'm right, it might be a good idea to keep this in mind regarding the people who work for you. Theodore Roosevelt, a man of tremendous ambition and unbelievable accomplishments, saw it this way: "Far and away the best prize life offers is the chance to work hard at work worth doing."

9. *Vision . . . seeing beyond daily duties; claiming new objectives*

It's good to think ahead and have a vision for the future. Remember, it wasn't raining when Noah built the Ark. There's nothing wrong with being a dreamer, because dreams can drive you to accomplish your goals. A dream can help you consider what your organization might be doing in five or ten years. A long-term plan gives you hope for the future. Hope is wonderful because it encourages you as you work and wait for better days. "A leader is a dealer in hope," wrote Napoleon Bonaparte. Hope is fuel that propels you into the future, and you need it. Author Hal Lindsey asserted, "Man can live about 40 days without food, about three days without water, about eight minutes without air . . . but only for one second without hope." Do you agree? What are you going to do about it?

10. *Relationships . . . everybody needs friends at work*

Cicero was one of the greatest thinkers of the Roman Empire. Here's one of the things he was thinking about: "Friendship improves happiness and abates misery by the doubling of our joy and the dividing of our grief." This is right on the mark, because friends give hugs, offer pats on the back, and share smiles. Friends help friends through problems, anchor them in reality when they are facing big decisions, and hold them securely when they are sorely tested by life's many unexpected obstacles. This is why friendship is so important, because life is sometimes tough, and the road can get rough.

Sooner or later, all of us need someone to help us to stay determined in the face of daunting challenges, to affirm our worth, to give us hope when we're faltering, and to occasionally inject us with courage. As a poet once wrote, "Friends are the flowers in the garden of life." One of the best things you find at work is the opportunity to meet good people and share your lives with them as you proceed down your career path. So, what if you took time to be available? What if you made plans to impact the lives of those you work with?

My observation is that effective leaders help both themselves and others to do more when they create environments where work is valued rather than merely tolerated. A man I know owns a small ice cream shop that does a mountain of business. One day I asked how he manages to do so well despite competition from national franchises. He said he always puts too much hot fudge on the sundaes and does much more work than he needs to—and this impresses people so they keep coming back. What a great idea!

Excellence starts with you.

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Leveraging ASHRAE Standards for Facilities Operational Success

By David Handwork

Codes, standards, laws, and regulations largely dictate the planning, design, construction, and operations of the campus built environment. APPA has for many years recognized the significance of standards and codes, and the importance of providing a facilities management voice at the tables of standards development organizations (SDOs) such as the International Code Council (ICC), the National Fire Prevention Association (NFPA), and the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE). Having a voice of influence and input regarding SDO activities is a key mission for the APPA Standards and Codes Council (ASCC). Typically, the council's activities include responding to addenda and actions that could negatively impact facilities operations, or providing support or input into positive initiatives and enhancements.

In previous articles for "Code Talkers," this author has often focused too much on the challenges that codes can present. It may be fair to state that most facilities managers view codes in a less than positive light—that is unfortunate. Therefore, it is appropriate to pose the question: How can facilities managers leverage standards and codes to enhance the safety, security, resiliency, and environmental sustainability necessary for operational success? Addressing this question for the entirety of standards and codes is too expansive for a single article, and my expertise is limited to ASHRAE-produced standards. To refocus the question: How can APPA members and facilities managers successfully leverage ASHRAE standards? Two basic principles address this question:

1. ***Being cognizant of the positive intent of ASHRAE standards, then applying them as best practices in campus operations.*** For example, Standard 62.1 (building ventilation) provides healthier indoor environments for building occupants. Healthy learning spaces ensure that students, faculty, and staff are productive in teaching and learning experiences. Data from numerous research projects supports the improved occupant productivity outcomes and satisfaction resulting from properly ventilated spaces. Standard 90.1 (energy performance) provides a minimum standard for energy conservation, while comparatively, Standard 189.1 provides optimized energy performance. Depending upon utility rates, both standards can be justified by their attractive return on investment, ultimately reducing operating costs. Other standards focus on human safety as an operations responsibility, such as Standard 188, "Legionellosis: Risk Management for Building Water Systems." This standard provides field-validated best practices for minimizing an organization's risk of legionella occurrences in new construction and older buildings. Facilities managers who commit to applying these and other standards' positive intent will position an excellent built environment for students, visitors, faculty, and staff.

2. ***Leveraging APPA's relationship with ASHRAE to engage ASHRAE activities through APPA membership.*** In 2016, APPA's and ASHRAE's Board of Directors affirmed and signed a Memorandum

of Understanding that opened up organizational collaboration. To date, both organizations have engaged on topics including Total Cost of Ownership (TCO), ASHRAE's Living Labs initiative on university and college campuses, ASHRAE education programs at APPA U, ASHRAE's Building Energy Quotient (bEQ) initiative, which couples academic programs with facilities operations for building audits and labeling, and an APPA representative seat on the ASHRAE President-Elect Advisory Committee. This emerging relationship offers membership from across APPA and ASHRAE access to important programs and initiatives. For example, the APPA Standards and Codes Council organized an ASHRAE Work Group for engaging standards development and actions. The Work Group is fairly new, but adds the maturity and active contribution of APPA members, representing the perspective of facilities managers on code development and maintenance. This cooperation will further enhance organizational outcomes for both APPA and ASHRAE, and will subsequently provide additional owner-centric technical training to APPA members that is not currently or readily available. As this collaboration grows and strengthens, both memberships will reap the benefits of educational programs, networking, research, professional development, and improved built environments.

Embracing these two principles does not negate interaction and engagement when any standard or code creates moderate or unreasonable challenges for facilities managers. Acquiring a healthy, positive view of the constructive aspects of codes will help managers maintain a balance with an equally healthy discernment of challenging codes and standards issues. ASCC invites all interested members to participate in the ASHRAE Work Group or other work groups that match member interest and expertise.

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Advanced Smoke and Fire Detection Used at Temporary Facilities

By Ryan Sandler

Before the Patriots could take on the Rams in the Super Bowl, it was necessary to ensure the safety of assigned broadcast personnel and equipment at the Georgia World Congress Center Authority (GWCCA) convention center. Like other facilities located near the Mercedes-Benz Stadium in Atlanta, Georgia, the convention center was being used to accommodate the immense surplus of support personnel and equipment associated with the game.

When major events like these come to your campus, temporary facilities are often required to accommodate specialized equipment and support personnel. In the case of the GWCCA convention center, this meant building temporary offices within a large hall to accommodate everything. The offices included a broadcast control room, a room for storing engineering equipment, and a meeting area.

Despite being a temporary solution, the newly constructed office space had to remain compliant with fire codes, which meant that a complete fire detection system had to be installed and later removed.

Installing a "temporary" fire detection system is no small feat, however. Although traditional spot smoke detectors are easy to install, they require certified electricians to run electrical conduit and wire to each unit, which connect back to a central alarm panel.

Although the GWCCA convention center had its own traditional fire detection system, the decision was made to install a complete, stand-alone system, including a fire alarm panel.

"They were not going to accept the convention center's existing fire alarm system on its own," says Christian Santamaria, a cofounder of Intelligent Fire Systems & Solutions, Inc., a fire and life safety installation company involved with the project. "They wanted additional protection for the temporary structure within the center that was completely separate from the existing system, so it could be installed quickly and removed with ease after the event was over."

According to Santamaria, the fire marshal specifically recommended an advanced aspirating smoke detection (ASD) system for the application.

An ASD unit draws air in through tubing connected to small, unobtrusive sampling points located in each room. The air is analyzed to identify the presence of minute smoke particles in a continuous process using sophisticated laser-based technology built into the central unit.

The system can detect minor particles in the air much faster than traditional spot smoke detectors, even before a fire begins to flame and burn. In many cases, early warnings can speed evacuation and prevent fire spreading to other areas.

The technology, though advanced, is not new. Aspirating smoke detection technology has been used for decades in sensitive applications such as cleanrooms and data centers, where early smoke detection is critical.

Although the ASD system is often installed as a permanent solution, the ease of installation makes it ideal for operational smoke detection in temporary facilities or during construction or remodeling of any space. The ASD has already been installed for this purpose in schools, universities, hospitals, and medical office buildings.

Right: Air is analyzed using sophisticated laser-based technology at the central unit to identify the presence of minute smoke particles in a continuous process.

Below: To speed installation, the stand-alone fire detection and notification system was pre-assembled with aspirating smoke detection technology before it was shipped to Atlanta.

According to Santamaria, the ASD detector used for the GWCCA convention center application utilized six smoke detection sampling points, although a single detector allows for up to 40. He notes that the fire marshal specified that audible/visible alarms had to be installed inside and outside the temporary offices as well.

One of the most helpful factors in this project was the simplicity of the ASD system as compared to traditional methods, which usually involve running electrical wire and conduit.

"Depending on the size of the rooms, it can easily take a couple of days just to run electrical wire and conduit between rooms, which adds to cost and complicates removal," says Santamaria.

In contrast, an aspirating smoke detection system does not require a certified electrician to run its small, flexible tubes to the designated locations. The central unit also simplifies testing and monitoring of the system.

To speed installation, Intelligent Fire Systems & Solutions prefabricated and programmed the ASD aspirating system before it was shipped to Atlanta. "We also created a video to demonstrate how to install and test the system for the installation team onsite," explains Santamaria.

Although he was on standby to fly to the location if needed, the installation team was able to successfully install the ASD unit without difficulty. Once installed, the system was quickly inspected and approved by the fire marshal.

Since it was implemented as a stand-alone system and without running electrical wiring, the ASD unit was easy to remove. It is possible the system could be utilized at other events that have temporary structures requiring a fire alarm system, although this has not been determined yet.

"Because the aspirating smoke detection system is not tied into the facility's electrical or fire detection systems, it is easier to remove and reuse in different configurations and even with more sampling points if needed in the future," explains Santamaria. "That kind of flexibility is the reason the system works so well as an economical, temporary solution for events requiring supplemental smoke detection."

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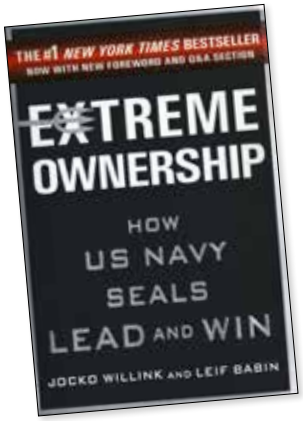
Book Review Editor: Theodore J. Weidner, Ph.D., P.E., AIA, CEFP, DBIA

Summer is here and now it is time to roll-up your sleeves and get cracking on all the projects that have been requested that cannot be accomplished with a campus full of students. It's also time to consider renovations to do for your organization or for yourself to get ready for the new fiscal year.



EXTREME OWNERSHIP: HOW U.S. NAVY SEALS LEAD AND WIN

Jocko Willink and Leif Babin, St. Martin's Press, New York, 2017, 312 pp., hardcover, $27.99.

It's not unusual for talented military leaders to develop a successful and valuable business consultancy following their military careers. *Extreme Ownership* articulates some of the achievements and lessons that have resulted from the military experiences of two U.S. Navy SEAL (Sea, Air, and Land) officers who have built such a successful consultancy.

The first thing to keep in mind is that anyone who serves as a Navy SEAL is a special person who has developed both physical and mental prowess. The training is rigorous and the challenges they face on the battlefield are difficult for many of us to imagine. As one reads *Extreme Ownership*, one comes to understand the hardships of training and conflict that the SEALs experience. They're impressive, and I'm grateful that the SEAL teams are there to protect us.

The 12 chapters of *Extreme Ownership* are used to present 12 leadership principles. These principles have a military theme and are equally divided into three sections: "Winning the War Within," "Laws of Combat," and "Sustaining Victory." Each chapter begins with a real situation the authors experienced together or individually. Each of the descriptions would make a good story line for a movie. Each chapter segues to the specific principle illustrated by that situation (e.g., "No Bad Teams, Only Bad Leaders," "Believe," and "Check the Ego"). Finally, a business application scenario completes each chapter, describing the beneficial result achieved by following the leadership, commitment, and execution principles of the SEALS.

The military theme is integral to the concepts presented in *Extreme Ownership*, even though they are applied to peaceful corporate settings. The leadership principles discussed in the book also address the teamwork characteristics that exist among the SEALS. That is, successful organizations aren't successful just because they have a great leader; they are successful because the leader and the team members work together well to accomplish the mission—which also includes sustaining your goals after they have been reached.

If you enjoy military history and need a good book on leadership, this is the book for you.

Ted Weidner is an associate professor at Purdue University and consults on facilities management issues primarily for educational organizations. He can be reached at *tjweidne@purdue.edu*. If you would like to write a book review, please contact Ted directly.

new products

Compiled by Gerry Van Treeck

CASCADES INC., a manufacturer of green packaging and tissue products, announces the launch of the Latte Collection. Available within the Cascades PRO Select and Cascades PRO Perform collections of paper towels, toilet paper, and facial tissue, this new line is manufactured from a combination of white recycled fiber and cardboard, providing customers with a solution that delivers the same great performance as white paper products, but at a reduced cost. For additional detailed information on Cascades Inc. visit *www.pro.cascades.com*.

LUMILEDS introduces the LUXEON IR 2720 line, high-power infrared emitters for abundant radiant power delivered in an industry standard package for seamless integration in existing designs. The emitters provide high radiant power of up to 1,300 mW at 940-nm wavelength or 1,250 mW at 850-nm wavelength, and feature high efficacy and a popular 120° beam angle. The 2.75 × 2.0 mm LEDs are undomed and especially useful for applications with package height limitations that prevent the use of domed solutions. The emitters address a wide array of cost-conscious infrared applications, from surveillance and machine vision to iris scanning and health monitors. For more information about Lumileds visit *lumileds.com*.

MILWAUKEE announces the addition of a 40-in. Steel Work Cart to their popular offering of steel storage solutions. The new 40-in.Steel Work Cart is constructed with a reinforced frame, 5-in. industrial casters, and a 700-lb. weight capacity for ultimate durability. The cart includes 100-lb. soft-close drawer slides, a built-in power center for instant access to power, removable storage cups, and an integrated wire spool holder.

For added utility, the 40-in. Steel Work Cart also comes equipped with movable utility shelves. For more information go to Milwaukee online at *www.milwaukeetool.com*.

QUASAR bottle fillers utilize an energy-efficient, ecologically smart LED to deliver UV light, specifically UV-C, to cleanse drinking water as it comes out of the dispenser. QUASAR fillers achieve a 99.99 percent reduction of common waterborne pathogens, including giardia, legionella, listeria, cryptosporidium, shigella, and E. coli, among others. When paired with OASIS water filters, also available with each unit, QUASAR provides the ultimate in safe, pure, pathogen-free drinking water. QUASAR's exclusive UV-C LED is active directly at the dispense point, offering a number of advantages. For more information on QUASAR visit *www.oasiscoolers.com*.

STAYDRY SHOWER SYSTEMS has two styles of extra-long shower rings/hooks that can add from 3.0 in. up to 8.5 in. to any shower curtain. These extra-long rings or hooks can save you the time spent having to move your shower rod, and save you from spending more funds to purchase a longer shower curtain or having a custom shower curtain made for your specific installation. The rings are designed to work on a standard residential shower curtain rod with a diameter of 1.0 in. or on a commercial shower rod with a diameter of 1.25 in. Now you can keep your bathroom floors clean, dry, and safe by having a shower curtain of appropriate length. For more information, please visit StayDry Shower Systems at *https://staydrysystems.com/shop/extra-long-shower-rings and https://staydrysystems.com/shop/extra-long-shower-rings-institutional.*

MEGGER offers an advanced dual-channel time-domain reflectometer (TDR) that can detect illegal taps without having to power down the line being tested. The TDR2050 has a built-in, 600-V CAT IV input protection filter, enabling it to connect to known live lines. This TDR features a large, color wide video graphics array (WVGA) display with easy setup features. Directional control buttons and soft keys provide intuitive, easy operation for the user. A built-in AutoFind mode allows for speedy identification of faults. One press of the AutoFind key automatically adjusts the range and gain, while positioning the cursor to the first major event on the cable; press the key again and the cursor jumps to the next detected disturbance. Perfect for locating faults on paired metallic cables by electrical service contractors, telecommunications technicians, and cable television workers, the TDR2050 includes an auto selection option to ensure that the most effective parameters are chosen depending on the range required, aiding rapid diagnosis of the TDR trace. A manual override on the unit allows for fine tuning to enable identification of hard-to-find faults. For detailed information on Megger visit *http://us.megger.com/blog.*

CUSTOM EQUIPMENT LLC introduces the all-new, PA-1030 push-around lift as a safer, more productive alternative to ladders and scaffolding. The PA-1030 easily enables users to manually maneuver the unit into place and hydraulically raise and lower it to the desired work height. The push-around lift segment is quickly becoming one of the fastest-growing segments of lifts, as maintenance and safety managers look for more effective ways to provide increased safety and productivity in applications where ladders and scaffolding are commonly used, such as general construction, facility maintenance, and manufacturing. For additional information on Custom Equipment LLC visit *www.hybridlifts.com.*

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