

# CAPPA Newsletter—Summer 2016



## From the President:

By Ed Heptig, Kansas State University

As we all know, summer break is coming to an end. In a few short weeks thousands of students will once again be moving about our buildings and grounds. As the new school year is about to begin, we find ourselves hurrying to complete campus projects in preparation for the students return.

Recently, I attended the APPA Regional Conference hosted by APPA, SRAPPA and TNAPPA in Nashville, Tennessee. Many of you where there, too. We were treated to a great conference. I was told there were over

1000 members and business partners in attendance. APPA also held two Summits, The Senior Facilities Officer and The Emerging Professionals during the conference. We welcomed the new APPA President Chuck Scott from Illinois State University. Chuck thanked Pete Strazdas for his leadership as our past president. He then brought up a life size cut out of Lander Medlin and stated that in just his first few minutes as president he had done what the past presidents had always wanted to do - "clone Lander". It has a comical closing to a great conference. I hope those of you that attended were able to take meaningful information from the conference back to your home campuses.

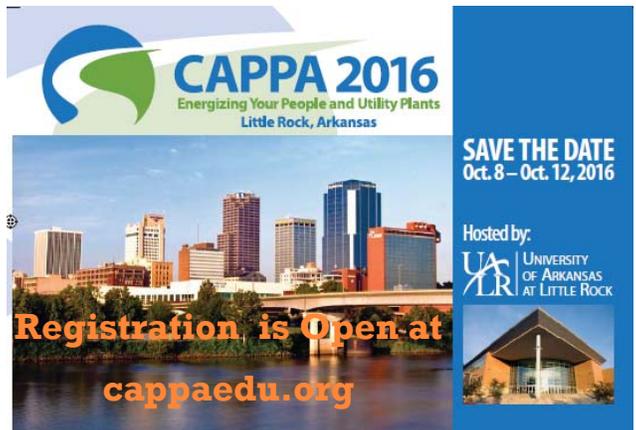
I was happy to see **JB Messer** return to CAPPA-if only for a short time, as he received the **Meritorious Service Award** for his accomplishments while with CAPPA. We wish him well in his new job, as he works with the ERAPPA helping them move forward. **Markus Hogue** received the **Unsung Heroes Award** for the energy he has brought to CAPPA during the past year. **Shelton Riley** was also recognized for being the outgoing **Senior Representative** for CAPPA to APPA. Shelton has completed the seven-year commitment he made to serve as the President of CAPPA. Thank You Shelton. My thanks to Glen Hubold as he succeeded in his goal to fill the open XC positions. Glen worked very hard to complete this mission. As always, our real job workloads change and we find ourselves needing to make adjustments in our volunteer

roles. Over the past few months, some changes to the committee have been necessary. David Millay needed to step away from his duties as Membership Chair, Randy Culver stepped in to fill the position, as long as we could have Art Jones come out of retirement to fill the Historian position. Treasurer Tim Stiger move on to a new job which meant he needed to step down and again we had someone step up: Angie Mitchell. This was a good fit as Ian Hadden and Angela Meyer are working on their conference. Angie has been involved with the process so the Treasurer duties were familiar to her. This also came with Tim's endorsement. There is one position left to fill - Newsletter editor. I'm sure one of you will come forward to fill the opening. Please let Glen, Angie or myself know of your interest.

In closing, I'm looking forward to seeing you in Little Rock, Arkansas this fall (Oct 8-12, 2016). I'm sure Ian is putting together a great conference.

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**CAPPA 2016**  
Energizing Your People and Utility Plants  
Little Rock, Arkansas

**SAVE THE DATE**  
Oct. 8 – Oct. 12, 2016

Hosted by:  
**U of A** UNIVERSITY OF ARKANSAS AT LITTLE ROCK

**Registration is Open at**  
[cappaedu.org](http://cappaedu.org)



# From the Immediate Past President . . .



By Glen Hubbard

Some time back, my boss and I were discussing the value of our association with APPA. As a result of

that discussion, I sat down and compiled a list of as many items as I could of ideas that I have brought back over the years. This was from that list:

- \*Construction plans review process From Missouri State CAPPA 2011
- \*Internal Advisory Committee
- From our conversations with Iowa State at APPA
- \*Outline for Excellence, the Facilities and Services Strategic Plan

James Cole and CommTech Transformations assisted with the strategic planning process; this connection was made from service on the RMA Board of Directors

\*Campus Banners for Regents professors



Toolkit at Northern Arizona University

- \*Collaboration with Art program to paint switches and transformers to reduce graffiti
- Toolkit at Northern Arizona
- \*Methodology employed to provide services to Auxiliaries
- Toolkits at Nebraska, University of Houston, Montana State and Northern Arizona

- \*Warehouse and surplus property-Toolkits at University of Oklahoma and University of Texas
- \*Ideas used in the planning of the satellite ice plant
- \*Boiler plant staffing reduction

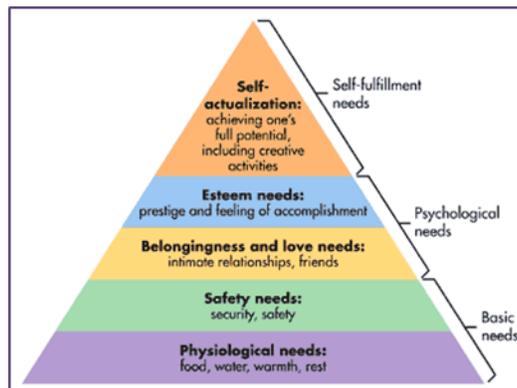


- \*Collaboration that resulted in reduced costs on the turbine upgrade RMAPPA 2008 at Arizona
- \*Capital Outlay and Strategic Asset Management
- Numerous sessions, but most recently WACUBO
- \*Strategic Procurement WACUBO

- \*Highest and Best uses for Real Estate-APPA Annual Conference in Denver when we met the Counselor's of Real Estate
- \*A "script" that saves time to close work orders
- APPA, CAPPA, and Assetworks conferences

Not only are there direct financial benefits, as you may recall from the Maslow's Hierarchy of Needs and Performance Management basics, there is also a motivational aspect to professional development. For most people, being able to improve one's skills and knowledge meets this highest need, that of self-actualization. We can usually recognize superior performance by offering even more professional development. Positioning high potential employees for advancement is a major and significant component of succession planning, and is the way we plan for the future.

Facilities and Services at NMSU has realized a significant number of achievements that have provided real value to NMSU. Some of these are in tangible dollar savings while others are through the implementation of best practices that will pay dividends later, but most all came about because of our involvement with professional associations. If you have not yet had an opportunity to sit down with your boss



Maslow's Hierarchy of Needs



## From the APPA Senior Representative . . .



By David Handwork  
Arkansas State University

Happy summer! I suspect everyone is busy addressing summer project work and maintenance, inside and out, before the mass of students return this fall. This is one of our annual life cycles of Facilities Management common among the CAPPA and APPA membership. As a self-proclaimed movie buff, these FM life rhythms remind me of the 2014 Tom Cruise and Emily Blunt science fiction film “Edge of Tomorrow” or commonly known as “Live, Die, Repeat”. If you have not seen this film, it’s a great original concept, but I am taking great liberty comparing to our FM cycles. Here’s the basic storyline sourced from Internet Movie Database:

“An alien race has hit the Earth in an unrelenting assault, unbeatable by any military unit in the world. Major William Cage (Cruise) is an officer who has never seen a day of combat when he is unceremoniously dropped into what amounts to a suicide mission. Killed within minutes, Cage now finds himself inexplicably thrown into a time loop-forcing him to live out the same brutal combat over and over, fighting and dying again...and again. But with each battle, Cage becomes able to engage the adversaries with increasing skill, alongside Special Forces warrior Rita Vrataski (Blunt). And, as Cage and Vrataski take the fight to the aliens, each repeated encounter gets them one step closer to defeating the enemy!”

Thank goodness our FM life rhythms are not dramatic life and death battles like the movie. My point is Cruise’s character is blessed to learn from his mortal mistakes in his time loop, effectively changing his future with advanced learned skills, and ultimately changing the future of people he cares for and all mankind. Wouldn’t it be great to get do-overs to improve outcomes of customer service and campus facilities improvements! In a direct way, we have “do-over” resources with our CAPPA and APPA association. Gathering lessons learned from our peers and through professional development opportunities facilitated by our local, regional, and national gatherings help us avoid “live, die, repeat” scenarios. Engagement with CAPPA provides access to the newly formed Mentoring program, recently launched at the annual APPA conference in Nashville. Engagement also provides development opportunities for Emerging Professionals, new supervisor development with Supervisor Toolkit, advance education with APPA Institute and Leadership Academy, and ultimately professional credentialing as a Certified Education Facilities Professional

(CEFP). I encourage all CAPPA institutions to consider attending the 2016 CAPPA conference in Little Rock, Arkansas. Emerging leaders are also need to engage on CAPPA committees, which provides a double growth benefit to the individual and CAPPA. In our very fast pace and quickly evolving culture, engagement is key to our professional success. If you are unsure how to engage, please don’t hesitate to contact any of the CAPPA leadership or me directly at [dhandwork@astate.edu](mailto:dhandwork@astate.edu), or by phone 870-680-4691. Hope to see you at CAPPA 2016 Annual Meeting!



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tives. Grade each presentation; not so much on how good a “showman” the presenter was, but on the information conveyed. Very often, one contractor will stand out as your best choice, and if all the other sins have been addressed, this may be the correct choice for your school.



## Gear UP for CAPPA 2016 in Little Rock, AR . . .

By Ian Hadden

CAPPA First VP

Time is fast approaching and registration is now open for higher education, emeritus, guests and business partners. We feel we have an excellent conference planned with tracks focused on Energy In Action (projects), Energy through Policy (programs, policies, codes); and Energy through People (training, behavioral programs, etc.).

Of course, you have questions about the fun side of the conference as well. We'll kick things off by opening the exhibit hall Sunday night with a reception (sponsored by Spirotherm) and conclude the evening with the traditional Sunday Night Football Watch Party (sponsored by Energy Solutions Professionals). Monday will kick off with an opening keynote address from Arkansas Governor Asa Hutchinson (sponsored by Armstrong International). Monday night we'll have a great dinner and provide a chance to tour the Clinton Presidential Library. Tuesday night our Awards Banquet will include entertainment

from Kevin Delaney, the science guy for Tonight Show with Jimmy Fallon (sponsored by Johnson Controls). We hope to keep the science experiments from getting too crazy, but it will definitely be fun. If you want a preview, just search "Kevin Delaney Jimmy Fallon" and you'll get a preview.

In addition to the main conference events, your Executive Committee will meet on Friday, CAPPA Committees will meet on Saturday and we'll have our traditional golf tournament and tour options for Sunday excursions. We know it's a challenge being out of the office and away from family for a few days but we hope to make you feel welcome in Little Rock! Part of that is learning everyone's names by wearing your name badge (sponsored by Harrison Energy Partners).

All Higher Ed attendees will receive a conference pull over (men's and ladies specific models) while guests and Business Partners may purchase them for \$40 each.

We are also hosting Academy On Campus – Leadership Academy Track

2. This is an excellent course offered in partnership with APPA. This really is a fantastic program but it does need a core number of attendees for you to get the full benefit. So talk to your boss about how strengthening your leadership skills will make their job easier and get registered.

And don't forget to submit a scholarship request to the Professional Development Committee, if needed. The PD Committee already has Track 3 in the works for CAPPA Tech in Feb 2017 so you have a great path forward. The course sessions will be Fri, Sat, Mon, and Tuesday. But don't leave before the Awards banquet Tuesday night or the CAPPA Members meeting Wednesday morning.

Registration fee summary:

Higher Education CAPPA/APPa member \$350.00

Higher Education non-member \$450.00

Business Partners \$1800.00 (includes 2 attendees and 10x10 exhibit booth)

Business Partner Sponsorships may be select from many options during the registration process.

## Getting Started on an Energy Master Plan . . .

By Phil Yuska

Performance Services

*This article is the first in a series of three publications on developing and implementing Energy Master Plans for educational institutions.*

The legendary baseball player and Coach Yogi Berra once said: "If you don't know where you are going, you'll end up someplace else." While these words can apply to business and life, it is absolutely true in the world of energy management. Energy costs have a large impact on budgets and can often be difficult to predict. Educational institutions should have a plan in place

to control, predict, and ultimately reduce future energy costs. In order to make progress towards long-term infrastructure goals, owners will spend a significant amount of time and money on facility master plans. While a facility master plan can guide your building projects, what will direct your long-term energy consumption? How are your buildings using energy and what kind of change would you like to see? An Energy Master Plan is a roadmap that guides your facilities toward energy efficiency and cost savings. Ultimately, it reflects your current situation as well as the path your organization must take to reduce energy usage. The following questions can be used as a guide

to determine if an Energy Master Plan would be beneficial for your buildings.

### 1. Do you need to control costs?

Energy prices will likely continue to increase over time, so it's crucial to have a plan in place to proactively reduce energy costs and minimize the effect on your utility bills. The need to cut costs can come from a number of different individuals. Your business manager or CFO is responsible for balancing the books, which would cause them to seek cost reductions anywhere possible. In K-12 schools, teachers are looking to save money because they require more resources for their students and classrooms. Students in higher education can be a driving force behind saving energy because of the demand for lower tuition.

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# Professional Development Committee

By Ben Boslaugh

Missouri State University

## EMERGING PROFESSIONAL FORUM

Are you looking for an opportunity to continue your professional development in Facilities? Have you attended Supervisors Toolkit? Are you looking for something that will challenge you to be a better manager, refine your communication skills, and help you be more effective as a leader?

The Emerging Professional Forum is an excellent bridge between the Supervisors Tool Kit and the Leadership Academy. I had the opportunity to attend it at the 2016 CAPPA Tech Conference. It is an all-day, focused event and is a great opportunity to meet fellow Facilities folks at all levels of Supervision & Management. It will help you assess who you are, revealing/analyzing your strengths and opportunities for growth. Conveniently scheduled just prior to the kick-off of the conference so that you won't miss the main events.

## LEADERSHIP ACADEMY

The Leadership Academy requires a time commitment, but it is time well spent! It is a 4 Track program spanning two years, culminating in a capstone course.

I attended Track 1 in San Antonio, TX at the 2014 CAPPA Tech Conference. It focused on Steven Covey's book, 7 Healthy Habits. Although I had some previous knowledge of the book, I found the examples and format very useful. This, combined with networking and group discussion, made for practical application of the materials. Also of note, several of us who started on this track graduated the Leadership Academy together. This was, in my opinion, a unique and very valuable opportunity. We built friendships, grew to understand each other's challenges, and could offer contextual advice. I feel that I benefited greatly from the whole experience.

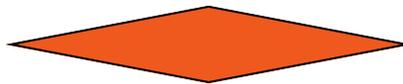
I attended Track 2 at the 2014 CAPPA Conference in El Paso, TX. This Track focused on who you are and how you impact others (MBTI). As a leader, this skill is imperative to your success. I found this

to be one of the most valuable sessions I attended. The course dives into the details of how we communicate with each other. If your team wants to improve its communication skills, I recommend this course.

The Track 3 team at the 2015 CAPPA Tech Conference was on "Effectiveness as a Manager", your team's purpose in the organization, and setting goals. This is an excellent course for effecting positive Change in a culture. I could have used a few of the tools in this course earlier in my career

I attended Track 4 at the 2016 APPA Conference in New Orleans. This offering was a culmination of all the Tracks and as such, coalesced all of the previous subjects. It was an excellent opportunity to reflect on lessons learned, genuine effectiveness, and your organizational effectiveness. It was also a good opportunity to network with Facilities folks from other APPA regions.

CAPPA has scholarships available – these courses can help you and your organization better utilize those tight budgets. I and my institution have benefited from several of these scholarship offerings. CAPPA will be offering Tracks 2 at the annual CAPPA Conference 2016 at Little Rock and Track 3 at CAPPA Tech Conference 2017. Track 4 is only at the APPA Events. If you are up to the challenge...this is a great way to hone your skills and sharpen your saw!



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## 2. Does your organization have sustainability or environmental goals?

Energy makes up a large component of your total carbon footprint. It is important to communicate your energy goals to employees and the public regarding your commitment to the environment. Do your employees, students, or customers expect you to be "green" or sustainable? Are there groups within your organization, such as sustainability committees, actively

pursuing environmentally friendly initiatives such as recycling programs or a Climate Action Plan Group? An Energy Master Plan can help address some of these issues and contribute to your overall sustainability goals.

## 3. Are you considering the advantages offered by new technology in energy generation, storage, or conservation?

Energy equipment costs are coming down and performance is increasing. Not keeping up can cost you in many ways including efficiency, reliability, and operating costs. New technology can significantly reduce the labor costs used to maintain and operate buildings. In an era where everyone is being asked to do more with less, new technology is often the answer. Excellent examples of this are the recent advancements in solar power and LED lighting efficiency.

Determining Your Goals and Objectives

Sharing a common goal or organizational direction is crucial for the success of an Energy Master Plan. Answers to the questions above will provide the foundation for your objectives, but they can vary greatly across the different areas within your organization. Keeping the core principles of your organization in mind will help you determine what your energy goals look like. Would you like to become a carbon-neutral campus? Are you taking steps towards Net-Zero Energy buildings? By asking what your organization represents and what role energy plays, you may discover the importance and impact of an Energy Master Plan on your future.

Taking the Next Steps

Once you have a shared direction and goal, you will likely want a partner to lead you through an Energy Master Plan. Like any good leader, it should be someone who has had success on this journey. Knowledge in energy efficiency and infrastructure is essential, as well as the ability and



## “How are you ensuring your building portfolio’s performance is optimized?”

By Michael Chimack, PE, QCxP, CEM, PMP  
Siemens Industry, Inc  
Building Technologies division

Today, energy costs alone represent about 30% of a building’s total operating costs<sup>1</sup>. How are you optimizing your building’s performance to minimize that cost?

While technological advances have certainly made it easier to optimize building performance, combining that technology with a comprehensive energy strategy can have a far greater impact on achieving operational savings. An effective energy reduction plan will help building owners and managers achieve maximum energy and operational savings, reduce environmental footprints, and increase the value and competitiveness of their building portfolios.

Through proper assessment and planning, including commissioning in your overall energy strategy will serve as a roadmap to continuously maximize your building performance. Generally, building operating costs increase over time, and Existing Building Commissioning (EBCx) can generate some relatively quick energy savings and operational improvements by taking corrective actions that reduce energy demand and consumption. Without commitment to maintaining these

corrective actions, building costs can eventually rise to original levels. Adding Monitoring-based Commissioning (MBCx) to the approach can enhance the savings generated by EBCx and may generate new energy and operational savings opportunities if properly implemented.

A fragmented approach to commissioning can compromise the long-term health of a building; while a focused approach enables the systematic investigating, analyzing, and optimizing of building performance to achieve operational goals such as greater building and occupant com-

fort, improved tenant productivity and enhanced sustainability.

To learn more about commissioning, and the valuable role EBCx and MBCx play throughout the phases of an energy strategy, please visit [usa.siemens.com/commissioning](http://usa.siemens.com/commissioning).

### 5 Phases to a Holistic Energy Strategy

The holistic nature of an energy strategy relies on a combination of people, processes, and technologies and is based on five phases that are inherently recursive and concurrent.

**Strategy & Planning:** Develop a strategic, actionable plan for achieving your overall business, energy, and sustainability goals.

**Evaluation & Assessment:** Identify opportunities to improve your resource efficiency, reduce your risks and costs related to energy procurement, and identify opportunities to increase your sustainability.

**Program Implementation:** Use the roadmap developed during the Evaluation & Assessment phase to initiate the turnkey execution of energy efficiency, energy supply, and sustainability improvement actions.

**Ongoing Services & Optimization:** Following implementation, ensure that energy and operational savings persist over time while delivering continuous building performance improvements.

**Measurement & Reporting:** Apply technology to confirm savings goals are continually met and additional improvements are identified.

## Greetings from the North Country . . .



*By Larry Zitzow  
University of North  
Dakota*

Finally the igloos have gone, the ice bergs have moved further north, the ice on the lakes has melt-

ed and the snow is gone. We now have green grass just like the rest of you. So the weather is great.

The economy is a bit challenging now as it is in other parts of our country with the price of oil dropping the state has really slowed down. The production of oil has slowed to almost a stand still. With the legislative session coming in January it will be interesting to see how the University will fair with dollars in the coming biennium. We have a new President that started on July first.

I want to say thanks to all my CAPPA friends for all the sharing, encouragement, listening, helping, and guiding, laughter. I received as a member of CAPPA. This region is strong with good leadership that will carry you forward for many years. CAPPA continues to be

a very strong region with good participation from the members. However I will suggest to those of you that have been members and have not yet participated in a committee or chair of a committee or on board of directors that this is a great opportunity just waiting for you. These opportunities provide so much satisfaction and rewarding that you will not understand until you take on that opportunity. So please do not wait take the opportunity now. CAPPA needs you to help keep the organization strong. I waited too long and sat by the sidelines and now wish I would of stepped up sooner. At the time I did not think I could provide that much value, or that somebody else wanted if so I did not do it. However in 2009 I become the President and that was the best decision I ever made. It provide me with so many opportunities and to be able to work with some people across the nation it was great.

I am retiring on August 12th of this year and so I want to say good by to you all and also thank you for the many opportunities this organization has provide to me. It has been a gratifying experience and hope I will run across some of you as I travel in my retired years. Keep up the good work and keep CAPPA strong.

## Maintenance, On the Map . . .

*By Julia Washburn  
SchoolDude*

Whether it's for academics, athletics or architecture, your school is probably on the map for some good reason. You might be known for any number of things, but there is likely something under the surface that keeps your university running in tip-top shape and able to deliver excellence on a daily basis: the maintenance and operations team.

As a facilities leader, your team is responsible for ensuring students and staff are comfortable and safe, and that everything within your operations is running smoothly. Since this is the case, it's in your best interests to equip your team with resources that maximize their time and streamline their workflow. No matter where your operations team is as far as technology usage, there's always room for improvement. Many universities today are discovering the benefits of adding new technology to their toolbox, increasing transparency, productivity and more.

### What is GIS?

One new tool is GIS technology. Geographic information systems (or GIS) can be particularly useful for higher education institutions, allowing them to do their day-to-day tasks with more confidence and efficiency. From mapping out utility lines to pinpointing maintenance needs to locating assets, GIS technology can simplify your team's work.

This cloud-based technology also offers the benefit of real-time results and the ability to equip your team to do their job while in the field on their mobile device. For Concordia University in Mequon, WI, this was a game changer.

This 6,000-student university used a maintenance management tool with GIS capabilities to see how different furniture would fit into various rooms before they moved faculty from office to office. "People are visual, so it's easier for my team to click on a room and see that it has 8 lights and 100 ceiling tiles without having to walk across campus," said Steve Hibbard, Director of Buildings and Grounds.

### Where's the data?

GIS technology not only saves staff time, but

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resources to develop your plan.

At the end of the day, energy will continue to be generated and it will continue to be used. An Energy Master Plan incorporates stakeholder accountability for building performance. If not executed properly, even the best master plan can fall flat and you may not be able to reach your intended goals. Take the first step by finding out where your organizational energy goals stand, make a blueprint for your facility's energy usage and start moving. The best time to start planning for the future is today.



## Truman State University Energy Project . . .

By Karl J. Schneider  
Director of Physical Plant

Truman State University is a public university located in Kirksville, MO with 7,000 students. We have 27 buildings comprising two million sq. ft. Like most other colleges and universities, we're faced with far more facility needs than we have the funding or personnel to support in the way that we'd like. Historically, we've spent approximately \$3.7 million annually on utilities (electric, natural gas, and water/sewer), which was a significant reason for looking into opportunities to reduce energy costs, and we ultimately decided to undertake a guaranteed energy savings program.

When we decided to move forward in late 2014, we sought a partner that was able to provide a comprehensive turnkey energy conservation program and we wanted to work with a company that was experienced with performance contracting as allowed by Missouri statute. As part of the RFQ and interview process, the Truman working group reviewed proposals from seven energy services companies (ESCOs) and ultimately selected Energy Solutions Professionals, LLC (ESP), a Kansas-based company that uses a streamlined business model to give its clients the opportunity to become more energy efficient, while also keeping down costs of improvements.

We began with an investment grade audit in December 2014, with a goal of working through all of the possible options and determining what improvements to move forward with by April 2015 so that construction could start that summer. We worked closely with ESP to evaluate around 325 energy conservation measures, and when selecting which upgrades to ultimately move forward with, we had to balance our most pressing needs with the options that provided the best ROI. ESP's vendor independence allowed them to competitively bid various so-

lutions that brought the greatest value to Truman State. These had calculated paybacks of less than 10 years each, and resulted in a project with \$1 million annually in guaranteed savings. The energy-saving retrofits addressed lighting, space heating, ventilation, air-conditioning, building envelopes, steam distribution improvements, energy management systems, environmental system controls, domestic water heating, air distribution systems and water consumption systems. Savings from the comprehensive project were also applied to deferred maintenance needs at Truman, which allowed us to start with a preventive maintenance approach for the new mechanical equipment and systems.

Overall, we've made a wide variety of improvements in an effort to reduce Truman's annual energy expenditures as well as its carbon footprint. Our \$10.5 million investment in our facilities will be paid by savings in 11 years. As a "paid by savings" project, there was no funding required from the taxpayers of Missouri or donors to the university. Additionally this was planned as a 16 month long project; however, ESP executed it in 13 months. The project was substantially complete in July 2016, and we expect all of the details to be wrapped up by October, including a chiller that was a last minute addition to the scope this summer due to the failure of an old one. This early completion is allowing Truman to garner maximum savings earlier than expected.

The environmental aspects of these project upgrades are significant. The changes will reduce Truman's consumption of natural gas, electricity and water, lowering the University's carbon footprint by approximately 20 million pounds of carbon dioxide, the equivalent of the annual emissions of more than 2,000 passenger vehicles. The amount of water saved each year would be enough to fill nearly 14 Olympic-sized swimming pools.

Truman State University and Energy Solutions Professionals (ESP) will be conducting a joint workshop at the CAPPA annual conference in Little Rock during the week of October 9<sup>th</sup>. The workshop title is: *"Make Major Improvements and Reduce Your Carbon Footprint while Enhancing Your Budget...A Program You Can Replicate at your College or University"*

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important to communicate the schedule in a way that the general public will understand. The team addressed the proactive management of the chilled water loop construction on existing/occupied campuses. Factors considered included student engagement, coordinating with other campus projects, accounting for safety of campus occupants and construction workers, communication of the project to faculty and students, balancing an existing chilled water plant and bringing this new plant on board.

Maximize summer construction Most college campuses are far less busy during the months of June and July. It is important to maximize the amount of work being completed at this time. With enough upfront planning and communication between the owner and the construction manager, it is possible to get the most work as possible done while school is not in session.

The team learned lessons in communication avenues when coordinating the mechanical upgrades to the 27 campus buildings while faculty and students continue to occupy and conduct research and teaching throughout construction. In order for large projects like this one to be successful on a busy college campus, it is important to take these best practices into account for efficient planning and preconstruction.

## The Five Deadly RFP Sins . . .



By Ron Segura,  
President  
Segura Associates—  
Business Partner

Colleges and universities send out RFPs (requests for proposals) on a regular basis. These can cover a variety of services and products, but one that is very important—because it can be one of the most costly expenditures of a university and impact the overall health of the facility—is the RFP for janitorial services. Most administrators know this but unfortunately, in my experience, not enough take the time to ensure their RFPs are doing the best job they can for their schools.

Just so we are all on the same page, a janitorial RFP typically lists all of the services, frequency of service, and other information required to keep campus buildings clean and healthy. When distributed to prospective cleaning contractors, it is designed so that they can “bid” on meeting the cleaning needs of the school and, hopefully, allow the administrators to compare “apples with apples” and select the best service at the best price.

But that does not always happen. And because the RFP procedure can be very time consuming as well as crucially important to the school, it is imperative that administrators avoid what I call the Five Deadly RFP Sins.

As I go through these, don’t be surprised if you have committed one or more of these sins over the years. Fortunately, all are correctable, which also means all can be forgiven.

In no specific order, the five sins are the following:

◆ **Failure to update the RFP.**

What happens at many schools is the only updating of the RFP is the date and due date that it must be returned. There’s actually a fairly good reason for this: historically, cleaning needs, products, and equipment did not change all that much. But in the past fifteen to twenty years, “change” is the profes-

sional cleaning industry’s middle name. Failure to update the RFP document can prove costly. An old RFP that lists floors to be stripped and refinished quarterly or carpets to be cleaned three times per year is totally out of date. Now we can often stretch floor refinishing cycles for 12 to 24 months, for instance, which is a major cost savings for any school.

◆ **Failure to determine your SOW.**

This refers to the scope of cleaning work at the school along with its cleaning goals. It is essentially the foundation for the RFP and, if properly identified, the SOW answers three very important questions: What is to be cleaned? How often is it to be cleaned? What are the outcomes we expect to see? The first two questions typically can be easily answered; defining “outcomes” can be a bit more difficult. An example of an “outcome,” would be a floor’s appearance. Do administrators want all floors to have a high-gloss appearance? If this were a medical facility, the answer would likely be yes. For a college campus, the answer may be yes in some areas and no in others. All of this must be clearly identified and determined so contractors know exactly what is expected of them.

◆ **Failure to be clear about green cleaning and sustainability initiatives.**

Most colleges and universities in the U.S. are in the process of transferring or have already completed implementation of green cleaning strategies. Not only must the RFP state if only green cleaning products are to be used to clean the campus, but it must clearly identify what this means. For instance, are cleaning solutions all to be certified by GreenSeal, UL Environment, or some similar organization? Are vacuum cleaners to all bear the Seal of Approval from the Carpet and Rug Association? Are workers to be certified by either GreenSeal (GS-42 program) or ISSA’s CIMS-GB

(Cleaning Industry Management Standard – Green Buildings)? These are green cleaning best practices programs. This should be noted in the RFP. Further, cleaning plays a key role in how sustainable a campus is because of all the chemicals and paper products used in cleaning. If the cleaning contractor is to take steps to help promote sustainability for the school, this must also be addressed.

◆ **Failure to pre-determine which cleaning contractors are to receive the RFP.**

Typically, colleges and universities will have certain requirements of their vendors relating to such things as insurance, workers’ compensation, or citizenship of the workers. Also, some contractors may simply not have the staff or equipment to service a larger campus. Before any RFPs are released, administrators must make sure they are clear exactly what they need from a cleaning contractor and ensure that the cleaning contractors responding to the RFP are in the position to satisfy those needs.

**Failure to request a formal presentation.** Historically, RFPs are simply returned to school administrators. Sometimes, the instruction are to just mail them back by a certain date. After they are reviewed, interviews are scheduled with those firms that appear the most promising. Today, it is important to take this a giant step further. More and more organizations want cleaning contractors—and many of their other vendors—to make a well-crafted presentation before school administrators. Subjects to be discussed go beyond the RFP; administrators are encouraged to submit questions or issues ahead of time that they would like addressed in the presentation. For instance, ask the selected contractors to suggest ways to improve cleaning efficiencies at the school, ways to reduce costs, or advance green and sustainability initia-

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## Waterproofing? Consult an Expert . . .

By Carter Pogue

Western Specialty Contractors

### FROM THE EDITOR:

**Thanks to all that submitted articles for Summer edition of the CAPPA Newsletter. I tried to get as many of the articles submitted entered in the Summer Newsletter. You can write and submit articles for the next Newsletter at any time. The next Newsletter should be issued some time in the fall.**

**We are currently looking for a Newsletter Editor. If you would like to volunteer, please let me know.**

They say "April showers bring May flowers," but spring's rain can also bring damage to a structure's roof, foundation, interior and more if not properly waterproofed. Water is moved through a structure via any number of forces including: hydrostatic pressure, capillary action, wind/air currents, surface tension and natural gravity. If there is any breach in a structure's envelope, water is sure to find its way in.

Waterproofing has come a long way since 1915 when cutting edge technology Ironite was first introduced. Painted onto the inside of basement walls, Ironite became a popular option because it could be applied quickly and it was less expensive than traditional waterproofing methods at the time. As the decades progressed, so did improvements in the materials and techniques used to completely waterproof a building from the roof to its below-grade exterior and interior walls and everything in between.

### Above-Grade Walls

The exterior walls of a building can be a significant source of unwanted water leakage. It's easy to forget how many openings are required in commercial building walls - from plumbing and irrigation connections to lighting, HVAC system elements, exhaust vents, air intakes, joints around windows and doors, and fire alarms, to name a few. There are also unplanned holes caused by aging brick joints that need re-pointing, vanishing sealants, damage from acid rain and settling cracks. All wall penetrations provide easy access for water, bugs, field mice, birds or other unwanted pests to enter the building and cause damage. A structure's first line of defense against the elements is above-grade waterproofing, which includes the use of caulks and sealants to seal the perimeters of windows and other openings. The amount of sealant needed on a new or existing structure depends on exposure and expansion/contraction problems that may be identified. Some types of sealants include:

- ◆ Elastomeric breathable wall coating systems
- ◆ Protective/decorative surface coatings
- ◆ Clear water repellents

### Concrete, Terrace Areas and Decks

In the winter, freeze and thaw cycles can cause big problems with concrete structures. When water infiltrates concrete, it can freeze, causing the water to occupy nine percent more volume than in its liquid state. This expansion causes distress on the concrete, which can lead to fractures that will continue to grow exponentially as saturation of the material increases. A wide range of restoration, repair and reinforcing services are offered by certified, specialty contractors who can repair cracks, spalls, rust spots, deterioration, pot-holes and heaves in concrete and masonry. More often than not, concrete repairs are made before they become a more serious or costly issue, but there are measures that you can take to actually prevent future damage. Applying hot applied or below grade waterproofing to your buried structures, a urethane waterproof traffic coating to your parking decks and protective acrylic coatings to your pedestrian areas and exterior facades will extend the life of the repair, protect adjacent areas that are currently in good condition and significantly improve the aesthetics of the area treated. Applied over concrete, wood or steel, a variety of deck coatings are available to prevent leaks from penetrating to areas below and can maintain the surface's color and keep it looking like new for years. Recent technology has provided materials for these special coatings that are ideal for suspended slabs, recreational roof decks, garages, patios, balconies, sun decks, areas around pools and other areas that require a durable surface.

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## Roofs

A commitment to good roof maintenance practices can prevent overflowing gutters, clogged downspouts and excessive ponding water which can lead to costly roof, facade and foundation damage. Decaying leaves, pine needles and dirt run-off can all contribute to ponding water and clogged gutters and downspouts, which is why it is essential that all roof drains remain clear of obstructions. In addition to the risk of water pouring into the tenant spaces should a breach in the roof occur, the freezing and thawing of ponding water during the fall and winter months can cause extensive roof damage. Applying waterproofing to a structure's roof is important and requires a professional's expertise to determine which option will work the best. Some available roofing systems include:

- ◆ Synthetic rubber materials
- ◆ Hot rubberized asphalt
- ◆ Insulated roofing membrane systems

## Below-Grade Systems

A number of excellent below-grade exterior foundation waterproofing systems have become available within the last 20 years for preventing water penetration through basement walls, concrete lids, pits and other below-ground areas. These waterproofing materials may be applied on the inside or outside of the wall or foundation.

- ◆ Fluid-applied elastomeric membranes, mastics and coatings that form a tough, seamless membrane to withstand abuse and high levels of hydrostatic pressure.
- ◆ Hot-applied rubberized asphalt for horizontal waterproofing in split-slab construction and insulated roof membrane assembly roofs.
- ◆ Single-ply sheet systems such as rubberized asphalt sheets, EPDM synthetic rubber, PVC, CPE, CSPE, Butyl rubber and Neoprene.
- ◆ Bentonite clay panel and sheet systems that swell when they become saturated to block moisture from entering a building.

## Interior Systems

Metallic, capillary/crystalline and cementitious materials are currently available for waterproofing a structure's interior. These materials may be applied by brush, trowel, spray or dry-shake methods to concrete or masonry substrates opposite the source of moisture. For foundations, these materials are applied to the interior of the structure. For tanks, reservoirs and other structures that hold water, these materials are applied to the exterior.

Waterproofing plays an extremely important role in protecting every aspect of a structure's construction. Knowing which waterproofing coverage to specify for a particular structure is more than just a science; it is an art form. Always consult with an experienced specialty contractor for the best options when waterproofing any part of a structure.



The CEFPP is the only facilities credential that focuses on your professional development, and now, all APPA regions are offering discounted pricing for their members to become certified. To find out more, contact [Kelly Ostergrant](mailto:kelly.ostergrant@appa.org) or go to <http://credentiaing.appa.org>.

Discounts are available for CAPP members. Contact the Professional Development Committee or an Executive Committee member for further details.

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also maximizes their work hours and provides a place to store historical data about every asset on campus. With a GIS-enabled solution, you can track fire alarm systems, underground utilities, outlets and much more with the click of a button or tap of a finger. This can be helpful in many scenarios. Say that you are onboarding a new maintenance staff member, and you want to get them up to speed as quickly as possible. While they're training or even completing their first projects out in the field, they can use the mapping technology to see all of the work that's been done in the past on an asset (as well as any notes that other technicians have left). Consider GIS technology your mobile file cabinet, with all of the information you need to know about each part of your campus. Having all of this data at your fingertips can allow your team to do your job more efficiently and empower you to make better decisions about your assets, staff and operations as a whole. Steve at Concordia says they plan to eventually share the building map information with students, in addition to how they use it now to save time, capture staff facility knowledge and be more informed about their overall school environment.

## What are you waiting for?

Your hours and days move too fast for you not to be utilizing new technology to make things easier for everyone. With a product like ConnectGIS from SchoolDude, you can use this powerful online maintenance management tool to provide location-based context to almost any asset in a facility. This can allow you to see the current state of your assets and facilities, as well as what their future might look like. Armed with that information, you'll be able to simplify everything on you and your team's to-do list, while ensuring you have the historical data needed to make asset management successful for your long-term operations.



## UNM Recognizes need for Water Safety Program

By Rachel Stone  
University of New Mexico

Modern science has created a dilemma for humankind. Now that we know billions upon billions of microorganisms live in the world around us and even within our own bodies, it's easy to understand why some people proudly proclaim, "I'm a germaphobe!" How does a healthy person stay healthy knowing there are microscopic threats to their health? The fact remains that we live in a bacteria-filled world, and most of us escape major illnesses attributed to these little guys even though we may come in contact with them every day. Interestingly, microorganisms affect the way that the University of New Mexico's Physical Plant Department (PPD) operates on a daily basis, with the goal of keeping UNM a beautiful, safe, and inviting place to educate students. Just under two years ago, PPD decided it was time to integrate a HACCP (Hazard Analysis of Critical Control Points) based water safety program, which includes testing, remediation, monitoring, and maintenance, of drinking fountains, water features, bathroom sinks, and cooling towers, to name a few. The reason behind this decision came from industry knowledge about potential harm to individuals who are exposed to waterborne and moisture-associated pathogens particular to large building water systems.

"Reducing the risk to our campus community is worth the expense of developing this water safety program at UNM," said Dr. Gary Smith, associate director of PPD Environmental Services.

Water is precious. It is a life-sustaining compound, but can be toxic if too much is consumed too quickly by a person (water intoxication). Its powerful make-up can corrode pipes and carry with it deadly bacteria and other disease causing pathogens, especially on a campus the size of UNM, which is considered a "large water system" by the New Mexico Environ-

ment Department. UNM pumps from its wells just under a million gallons of water on average per day, and is susceptible to housing a variety of bacteria within it, which have the potential to harm its users.

A common bacteria found in man-made large water systems across the globe is the *Legionella* bacteria, alongside the parasite, *Giardia* which is fairly prevalent in New Mexico. There are many other organisms that can be found in water include *Pseudomonas*, *Acinetobacter*, *Aspergillus*, and protozoans and this is why drinking water is treated with different chemicals to eradicate these microorganisms for safety reasons.

Routine maintenance, testing, and remediation are vital steps that must be taken in order to protect UNM's water systems. PPD has a preventative maintenance program which includes daily, weekly, or monthly flushing of various water sources. Crews also test for bacteria in the water every quarter. If bacteria are found in the water system, remediation techniques are enacted.

Smith said that PPD takes great steps to ensure the safety of the campus community. "For example, if we conduct our routine quarterly test and find *Legionella*, or other harmful bacteria, in a drinking fountain, then the fountain would be removed while we flush and disinfect the pipe and unit." Smith also said that in this hypothetical situation, the water fountain would not be replaced until they were sure that no such bacteria existed in the pipes or unit after remediation and re-testing.

Ever since the first known outbreak of Legionnaire's Disease (legionellosis) in Philadelphia in 1976, extensive research has been conducted to figure out how to prevent such an outbreak again. It was found that the most frequent identified sources for exposure to *Legionella* include cooling tower water vapor, and stagnant water in pipes connected to showers, faucets, water fountains, misting systems, and decorative water features.

The legionella bacteria can form in the biofilm along the pipe's interior and is released in the water vapor when the system is operational. This can transmit the bacteria to humans if breathed or aspirated into the lungs. Other factors that impact the growth of this bacterium are water temperatures, scale and sediment build-up on the inside of pipes, reduced competition of other microorganisms, and stagnant water.

According to the Center for Disease Control (CDC), about 8,000 to 18,000 Americans are hospitalized annually due to Legionnaire's Disease. It has been reported that approximately 4,000 Americans die every year because of this disease, a bacterial pneumonia.

Dr. Eleana Zamora, assistant professor of Medicine at UNM, and vice chief of staff at the Sandoval Regional Medical Center, thinks New Mexicans are less likely to contract Legionnaire's Disease because of our dry climate. "We have a really dry environment, it's not humid, so it doesn't tend to be as much in the environment as in other places like back east."

According to Zamora, UNM treats a few cases of Legionnaire's Disease every year. The New Mexico Department of Health, reported a total of eight cases in 2014. For comparison, the Michigan Department of Community Health, reported a total of 236 cases of legionellosis in 2014. Individuals with chronic health problems or compromised immune systems are at a higher risk of developing Legionnaire's Disease. Zamora said that prevention of the bacteria in water systems is vital in keeping New Mexicans safe. "We have a patient population that's pretty immunosuppressed at UNM, most of the HIV cases [are treated at UNM], our cancer center is very robust, we have a very active pediatric cancer center right there, so I think the risk is pretty high if we didn't monitor and surveil for it [bacteria]."

UNM is one of a few universities in the United States who have imple-

## Real Impact of Aging Higher Ed Facilities

By Jay Pearlman  
Sightlines

Many higher education campuses in the U.S. and Canada have buildings and systems that are well overdue for a major renovation. Unfortunately, these institutions are not investing the necessary capital for the upkeep of these aging facilities. The result is a substantial increase in deferred maintenance — or the postponing of maintenance to save costs or meet budget funding levels. Higher education campuses are fairly familiar with the convolutions of capital planning. But facilities management and renewal compete for funding resources that have not fully rebounded from the economic downturn of 2007–09. Facilities managers are faced with the added challenge of making the case for a piece of this limited funding. And that's no easy feat.

The first step is to understand the true

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mented a HACCP based water safety program. Since 2000, the CDC's Legionella Outbreak Response Team has advised facility managers to apply HACCP principles to prevent an outbreak of Legionnaire's Disease. "Since, 2000 there has not been a reoccurrence in any facility that followed this recommendation," said Claressa Lucas, Center for Disease Control ELITE program coordinator.

Within the last five years, there have been several high-profile, high-dollar legal settlements due to deaths from individuals contracting Legionnaire's Disease in public and private buildings. "UNM takes the stand that it's important to apply principals that are documented to prevent public illness from water systems. We want people to feel safe while visiting our campus, and it's important to lead the way and show we take our responsibility as facility maintenance managers seriously," says Smith.

cost of deferred maintenance in order to properly address and communicate it to financial stakeholders.

### **The Three F's and the Competition for Available Resources**

The three largest expenditures for colleges and universities are financial aid, faculty compensation and facilities. Financial aid is a ubiquitous expenditure borne by all educational institutions, as is the cost of retaining quality faculty. Both financial aid and faculty salaries account for a large percentage of a campus budget. While equally important, the third "F" — facilities — is often left grossly underfunded.

Faculty compensation and financial aid are driving forces that affect enrollment, campus image and more. Unfortunately, it's the overall lack of funding that has made it difficult for facilities managers to make valuable upgrades and schedule preventive maintenance, thus furthering the issue of aging infrastructure.

Enrollment trends are also causing competition on campuses. Declining or stagnant numbers of high school graduates are affecting college and university enrollments in most parts of the continent. Campuses that have grown space faster than enrollment now have more space to maintain and fewer students to fill it.

Conversely, institutions in states like Texas and Utah face unprecedented numbers of new students, many of them first generation college attendees. These institutions require new capital funding to relieve overcrowding.

### **The Problem of Deferred Maintenance**

The inability to upgrade or regularly service HVAC, roofing or electrical equipment, for example, increases the likelihood that problems will get worse with time. Just about every campus across North America is suffering from a backlog of deferred maintenance, with some being far worse off than others.

The real problem of the maintenance

backlog is that deferred costs actually lead to higher costs. That is because less preventive maintenance results in a shorter lifespan for facilities' systems and more emergency repairs, which are more costly than the planned repair.

### **The Importance of Remaining Vigilant**

Out of economic necessity, campus facility managers have had to defer maintenance on many buildings and building systems. While the year-over-year backlog of renovations and fixes has grown, the available capital has not. But you can only postpone the inevitable for so long. It's not all doom and gloom, however, when it comes to our aging campuses. In fact, there are proven ways to effectively address the issue.

Here are four steps that facilities managers can take to start chipping away at the backlog in campus building maintenance projects.

1. **Understand the current situation.**
2. **Gather the right metrics and have them analyzed.**
3. **Define goals and set priorities.**
4. **Communicate and engage with decision makers.**

Using these four strategies, facilities leaders have been able to make progress and change policies to help stem the growth of deferred maintenance on campus.





## Why Facilities Should Hire Interns . . .

By Rachel Novotny  
AssetWorks LLC

### 1. Interns are inexpensive

To be blunt, cost is an initial motivator for many internship programs. Departments need a few budget-friendly personnel options, and college students need money. Most interns are seeking work experience - and a bit of extra cash to make it through their college years.

Often, their other job options involve minimum wage work such as child care, foodservice, or retail jobs. Most of these opportunities won't pay much, and they provide little experience to pad their resumes.

Of course, you don't want to underpay an intern because you can get away with it. However, even with fair payment, interns can produce excellent work for a fraction of the cost of a full time employee.

Do your research and understand the internship laws in your area. While your internships aren't governed by many of the laws of full time employment, offer reasonable pay and work hours.

### 2. Interns are eager to learn

Most apply to internships because they're interested in the job and excited to learn about the industry. Take advantage of this excitement and harness their passion into positive changes for your department.

Even as they learn, interns can infuse fresh life and enthusiasm into your team. By hiring the right interns (more about that here), your department can gain a fresh face who will take advantage of the opportunity to learn and make a difference.

### 3. Share a passion for your job

Facilities management is a critical job. Your department is the backbone that supports the campus learning environment. Your work creates the learning environment that enables faculty and students to succeed.

Working with interns provides an outstanding opportunity to pass along your passion for your career. What better way to influence those entering

the job market than by working directly with them prior to their graduation?

### 4. You'll find great future job candidates

If you've hired high-caliber interns, you'll have a great candidate pool when it comes time to hire additional staff for your department. You'll already have a glimpse into their abilities and work ethic, you can skip an extensive onboarding process as they're already familiar with your department's processes and procedures.

### 5. They provide a new way of looking at things

Every employee brings a new perspective to the workplace. This is especially true when you bring a fresh demographic into the office. Fresh faces bring new ideas and resources. They're more likely to question the status quo, and create new methods for processes that "have always been that way."



## Central Association of Physical Plant Administrators

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Information at your fingertips! <http://cappaedu.org>

## Upfront Planning for Successful Projects

By Daniel Lacy  
McCownGordon Construction

Planning a construction project on a college campus is a complex undertaking. Contractors must take a wide variety of factors into consideration in order to accommodate everything that's constantly happening in the area.

For example, McCownGordon Construction is currently working with Kansas State University to add a new chilled water central utility plant, which includes 25,000 lineal feet of chilled water distribution piping. KSU is removing neutral bridges at the service entrance in 27 of the buildings on campus and converting the buildings to a variable primary flow control system, replacing underperforming or inefficient HVAC equipment and replacing pressure dependent chilled water control valves.

A combination of pressure independent and delta T valves is being installed to increase overall system efficiency and to maximize utilization of the installed plant capacity. These buildings also are receiving a complete Honeywell controls system upgrade, which will allow equipment to be scheduled and temperatures to be changed for additional energy savings.

The extensive logistics and upfront planning by McCownGordon are essential for a project of this complexity. The overall success of this project is due largely to the following best practices:

- ◆ Coordinate with the Campus Schedule. Events are constantly happening on college campuses. Students are attending classes during the day and at night, there are sporting events that bring additional traffic to campus and

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## Fellows Helping Facilities Introduce Sustainability



By Constanza Martinez  
EDF Climate Corps Fellow at  
Alamo Colleges

Alamo Colleges has been leading the successful implementation of several sustainability-related projects, ranging from recycling initiatives to complex energy efficiency installations. For the past four summers, the Facilities Department has added an [EDF Climate Corps](#) fellow to its team to help uncover new projects and savings to advance the colleges' energy efficiency and sustainability plans. EDF Climate Corps is a summer fellowship program that places trained graduate students with leading companies and organizations – Tesla, City of Houston, Howard University, etc. – to help make the business case for investing in smart energy management. With a diverse and advanced educational background, the fellows have helped this system of five community colleges in San Antonio, TX, take its sustainability programs to the next level.

Fellows have been uniquely prepared to work alongside the energy management team and help the Facilities Department assess the performance of its five colleges and approximately 200 buildings. They also have considered renewable energy options, evaluated funding for new projects and performed financial analysis. By the end of the summer, fellows recommend actionable plans for energy and sustainability management strategies that help Alamo Colleges get closer to achieving its carbon neutrality and climate resilience goals.

Fellows have mainly worked on projects that promote energy and cost savings, as well as environmental benefits to enhance the district's sustainability targets. Some examples include energy audits and lighting retrofit proposals, analysis of buildings' energy and water performance to select candidates for LEED certifications, and proposals to access hyper-local weather data to correlate with building management and

energy and water usage.

Another important area of focus is renewable resources. Alamo Colleges has installed approximately 600 kW-capacity in solar arrays, and more projects are on the way. Fellows have been tasked by the Facilities Department with analyzing the performance of current and future installations. Three of the five campuses hold a variety of solar applications including roof mount installations, connections to electric vehicle charging stations, solar bus ports and soon, solar car ports.

Finally, Facilities works with other departments to contribute to the colleges' sustainability plan. Topics such as indoor air quality, waste and recycling, resources to help incorporate sustainability in the curriculum and purchasing procedures are assessed by these fellows to propose action plans to continue integrating sustainable practices at the Alamo Colleges Community District.

To learn more about Alamo Colleges' summer fellows and other districts' energy and sustainability initiatives, visit: <http://www.alamo.edu/district/sustainability/>



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events such as career fairs, meetings, conference and more that drive traffic to campus buildings. It is important to check the campus schedule while building out construction schedules to account for these events and make sure the appropriate facilities are accessible when necessary. Doing so before construction even begins will save time and allow for fewer revisions of the construction schedule.

- ◆ Plan as much as you can up front. During the preconstruction and design phase the team's master planning plays a key role in right-sizing the campus infrastructure for current and future needs. The project team compared different equipment replacement options and control scenarios looking at not only first cost and life cycle analysis, but efficiency and optimization, as well as the logistical coordination of shutting down major campus traffic routes to implement the chilled water loop expansion and the preplanning required to minimize the impacts to the 27 buildings effected to upgrade the controls and hardware for existing mechanical systems and convert the campus to a pressure independent system.
- ◆ Alert professors and staff, communicate with students. It is important to keep an open line of communication with the faculty and staff of the campus, as well as the students. Professors need to know which facilities are and are not available in order to properly plan their schedules. Students need to understand what is open and what isn't so they can be kept safe.

As a construction manager, it is

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