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PAGE 5

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contents

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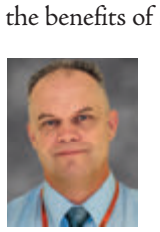
forum

Dan Hounsell, Editor, discusses the way one medical center discovered that if the promises of sustainability seem too good to be true, they probably are

Dave Lubach, Associate Editor, says managers who do their homework can help their departments uncover pleasant surprises

Michael Cowley, president of CE Maintenance Solutions, identifies five key performance indicators managers need to include on their management dashboards



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Ask the Drain Brains – When the holidays lead to grease clogs emergencies

By Marty Silverman – General Pipe Cleaners

Q. It happens every holiday season – Thanksgiving, Christmas, whatever – our tenants cook the turkey, pour the grease down the drain, then call me when the grease clogs the line. What drain cleaning tool would you recommend that will clear the line fast so I can get back to my family?

A. The best tool for clearing clogged sinks, tubs or laundry drains is the Water Ram. It uses a burst of compressed air to create a shock wave (kinetic energy) that follows the path of the water to quickly break up the stoppage. The shock wave travels around tight bends without losing its force and knocks out the stoppage without harming pipes.

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talking points

All That Glitters Is Not (LEED) Gold

Dan Hounsell, Editor

Among the lessons learned by the maintenance and engineering managers and staff at the Modesto (Calif.) Medical Center is one that applies to much more than just facilities:

If something looks too good to be true, it probably is. When the 670,000-square-foot center opened in 2008, it was intended to be a green laboratory for future green-building projects for Kaiser Permanente, the health care organization with more than 600 medical facilities.

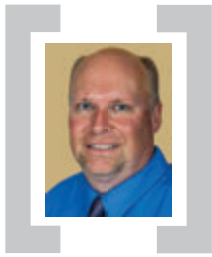
As I discovered when I revisited our 2008 article on the medical center, things have not gone as hoped, despite the best efforts of Ed Gonzales, the medical center's chief engineer, and his staff. Though the installation of permeable pavement in the center's parking lots has proven to be a successful sustainability effort, numerous systems and components in the facilities have not performed as intended and, in fact, have created major maintenance and operations headaches.

"We've discovered from the original building that there were many systems that were value-engineered, which means two things," Gonzales says. "One, sometimes things look good on paper when in reality, it's the end user that has to find ways to keep a system running. Two, saving money at the beginning will always cost you more in the end." You can read more about the ongoing maintenance and operations challenges facing Gonzales and his staff in my online-exclusive article at: http://bit.ly/19y12JF

Dan Hounsell offers observations about trends in maintenance and engineering management and the evolving role of managers in facilities.

Agree? Disagree? *Have something to say? We want to hear from you. Visit myfacilitiesnet.com/danhounsell, and start a conversation.*

Maximizing Technology, Expecting the Unexpected



Dave Lubach, Associate Editor

What benefits has a computerized maintenance management system (CMMS) delivered to your maintenance and engineering department?

I posed this question to several managers as part of this month's Roundtable on page 14.

Not surprisingly, the responses included such benefits as better asset control and improved schedule planning. But Frank Lucas, director of work management with the facility management department at the University of Nevada, Las Vegas, offered an interesting response. In 2010, his department "took on an additional 450,000 square feet of new space and didn't have to hire new employees."

Why? Productivity gains generated by the department's CMMS unexpectedly enabled existing staff to absorb the added work. That is what you call a pleasant surprise.

As it turns out, the department never received the funds automatically allocated to hire workers when new space is added. State funding was suspended due to budget cuts. But the cuts did not spell doom. Instead, they actually highlighted an existing technology — the CMMS — that helped the department weather the burden of more space to maintain.

Perhaps most importantly, this case demonstrated the need for managers to do their homework when researching technology investments. Managers cannot foresee all of the possible benefits a particular piece of technology will deliver. But by understanding department needs and specifying the most appropriate technology based on those needs, managers might just set their departments up for pleasant surprises down the road.

Dave Lubach offers insights gleaned from conversations with managers who make key maintenance and engineering decisions in commercial and institutional facilities.

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Michael Cowley

What's On Your Dashboard? Five KPIs Every Manager Should Use

All of us in maintenance and engineering management have struggled to find methods and techniques necessary to successfully analyze and understand our businesses and our facility maintenance performance. Instead, many managers look to their customer satisfaction numbers. Those numbers tell us how the department is doing as it relates to how our customers feel about us, but they provide very little information on our performance as a world-class maintenance organization.

Many organizations measure customer satisfaction, response time, number of calls completed per day, and the time it takes to complete an average call. In other words, how fast can we close a work request? The problem with these types of measurements is that, although they are very important, they do not tell maintenance and engineering managers how efficiently or effectively their departments are performing. The important thing to remember is you must keep the customer service numbers high, while at the same time finding ways to make your organization more efficient, effective, and profitable.

To successfully manage their departments, managers first must be clear about objectives and understand the reason they are in facility maintenance — to make the organization money. We can keep our customers happy at any cost, but if we don't care about cost, we will be out of business in a very short time.

The key to the future of maintenance and engineering management, especially if you want to keep the work in-house and avoid outsourcing, is to do a great job for your customers and, at the same time, do it efficiently and at the lowest possible cost. Don't forget: The reason the typical outsourcer of facility services is successful in taking over your business is because the owners determined it would be much cheaper in the long run to outsource the work. That topic is a column for another day, but many owners' perceptions are that someone else can perform as well as — and at a lower cost than — in-house workers.

Measuring what matters

To address the outsourcing challenge, managers must manage their departments more cost-effectively. The most effective strategy to achieve this goal is to use the five key performance indicators (KPI) that every maintenance and engineering manager should include on his or her dashboard to effectively monitor and analyze the way your current management process is performing, compared to your business model and vision for the future. Keep in mind the words of W. Edwards Deming, who popularized the concept of total quality management, who said, "You cannot manage what you cannot measure."

I will leave the customer satisfaction measurement off my list of key KPIs because most managers already focus on it. In reality, many departments are too focused on making customers happy. Most customers really don't expect the department to complete all work requests immediately. What they do expect is good communication, high-quality workmanship, reasonable cost, and follow-through on promised completion times or dates.

In reality, many departments are too focused on making customers happy

Many management experts will debate the top five KPIs, but to at least get you started down the road of the performance measurement, I recommend these five:

- backlog of deferred work
- percent of completed work that is reactive
- preventive maintenance (PM) program compliance
- pareto analysis of completed work
- weekly work-schedule compliance.

Let's take a closer look at each one of these to understand its purpose and application.

Backlog of deferred work. This KPI is one of the first measurements to put in place, especially if the department uses a computerized maintenance management system. The backlog measures all deferred work, which is work not important enough for assignment and completion in the current work week. In other words, the department will consider it for future weeks, depending on the priority of the request as it relates to other work tickets. Managers should measure backlogs in hours and convert the data to backlog weeks, which allows comparison of crews with different numbers of technicians. The typical goal for this KPI is a backlog of four to six weeks.

Percent of completed work that is reactive. This KPI measures whether your organization is stuck in a culture of reactive maintenance or is moving toward world-class or high-performance maintenance. This transition is important because reactive work costs four-six times more than planned and scheduled work. Managers should shoot for 20-30 percent of completed work being reactive.

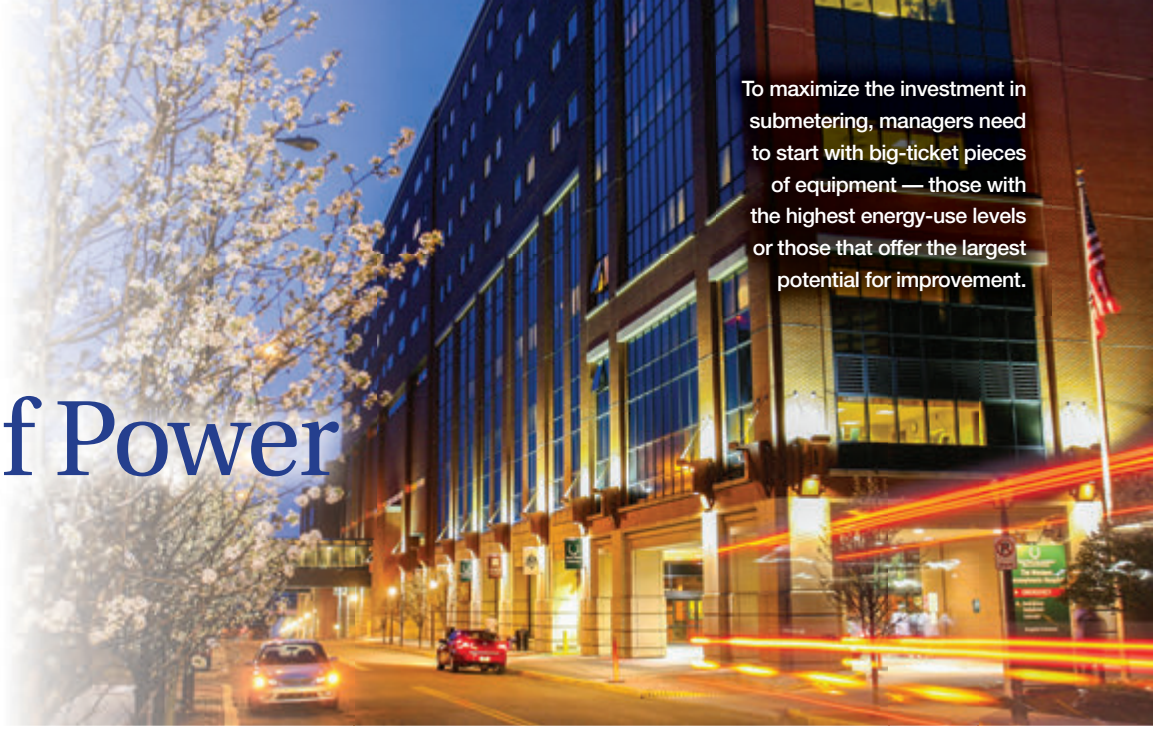
PM program compliance. This KPI indicates whether the department is improving proactive maintenance. To succeed in the asset management and reliability categories of maintenance, you must have a disciplined PM program that produces results. A successful PM program includes all critical equipment, and technicians will complete 99 percent of PM inspections and procedures on time.

Pareto analysis of completed work. This KPI is critical in analyzing the types of work requests that consume maintenance resources. Pareto developed the 80-20 rule: 20 percent of a facility's assets and equipment consume 80 percent of resources. The purpose of Pareto charts and graphs is to present these results in a format employees can easily understand and interpret. Managers should publish charts weekly and monthly to demonstrate the way work needs and demands are changing.

Weekly work-schedule compliance. This KPI measures the ability to schedule and complete work for customers. One key to successful management is to be able to promise your customers the day and time technicians complete requested work. This KPI is a great tool for determining the way supporting tools work together in order to deliver a good product to your customer. Remember, no department wants to be thought of as a team of cable guys, who never complete what they promise on time.

Now you have the KPIs you need to move from a reactive organization to a proactive, world-class maintenance operation. ■

Agree? Disagree? *Have something to say? We want to hear from you. Visit myfacilitiesnet.com/MichaelCowley, and start a conversation.*



To maximize the investment in submetering, managers need to start with big-ticket pieces of equipment — those with the highest energy-use levels or those that offer the largest potential for improvement.

Submetering: Taking Control of Power

Technology puts essential data in the hands of managers looking for energy-savings opportunities

By James Piper, P.E.

The installation of meters to monitor specific electrical loads in institutional and commercial facilities is gaining in popularity with maintenance and engineering managers. Developments in meter, communication, and monitoring technology have transformed necessary data into critical information for those seeking to manage energy use within their facilities.

Managers who have embraced the technology and installed submeters in their facilities have been able to collect data on how much, where, and when their facilities use energy, and they can use it to guide their conservation efforts. Those who have not implemented the technology most likely do not understand the benefits of the information submeters provide.

Cost allocation

Most facilities have one master meter that records such factors as total facility energy use, peak demand, and power factor. While this system gives a utility information it uses to bill a facility, it does not indicate specific areas of a facility using the electricity. But submetering, through the installation of meters at various locations throughout the facility, can provide that data.

A typical submeter installation includes the installation of split-core current sensors installed around electrical feeds to monitor current, and a separate sensor to monitor feeder voltage. Meters can be standalone units or can transmit data generated by the sensors to a host computer by cable, modem, or radio-frequency technology. Software on the host computer can be used to generate individual utility bills or equipment load profiles.

Probably the first users of submetering technology used meters to fairly allocate energy costs among users. Before the installation of submeters, facilities with master meters used some arbitrary means of allocating electrical energy costs among occupants and tenants, such as basing the bill on square footage occupied. Such a system rewarded those who used the most energy but penalized those who used the least. The strategy also removed any incentive to conserve. Submetering fairly allocates utility costs based on actual use and motivates occupants to become more energy-efficient.

Similar situations existed in educational facilities and in particular universities, which feature a mix of education, research, residential and support activities. In many such cases, the research, athletic, recreational, student housing, and other support activities had to pay for their energy use with income they generated. Without metered data, many developed arbitrary, inaccurate and sometimes complex systems for billing these groups. The installation of submeters enables managers to replace these billing systems with systems that are fair and accurate.

Identifying opportunities

While allocating costs to users is one of the driving forces behind the use of submeters, it also gives managers opportunities to curtail energy costs. Managing energy use requires that managers first understand the location and timing of its use. Submetering gives managers that information.

For example, managers can have submeters installed on systems and individual pieces of equipment, such as chillers, air handlers, and pumps. Over time, the meters will gather data managers can use to create energy-use profiles for those systems and pieces of equipment.

By monitoring performance, managers can detect any deviation, which could result from a change in occupancy, user requirements, or something related to the equipment itself, such as the fouling of heat-transfer surfaces. Early detection of these changes allows managers to take corrective action before problems develop into large energy losses or equipment failures.

Submetering mechanical equipment also allows managers to compare operating efficiency. For example, if a facility's central plant has two centrifugal chillers, developing energy load profiles for each chiller provides a basis to compare their operating efficiencies. While slight differences are normal, larger differences can indicate improper operation in the less efficient chiller.

Submetering individual pieces of equipment also can lead to more cost-effective use of electricity. Commercial and educational facilities often have particularly large electrical loads associated with the operation of one piece of equipment, equipment that is not operated for long periods of time. Submetering can show the impact a particular piece of equipment has on the facility's overall electrical demand.

And because demand charges are a significant portion of the monthly electrical bill in many applications, operating that equipment during periods of peak demand can have a large impact on the facility's electrical bill.

Moving the load to off-peak hours can save tenants, departments, and managers considerable charges.

Load shifting offers managers another advantage. By reducing a facility's peak demand — particularly if it coincides with the peak-demand period for the local utility — the facility might qualify for a lower rate structure.

For health care, educational, and commercial facilities, all that might be required is to have departments and tenants schedule their energy-intensive operations for off-peak periods.

Yet another benefit of submetering technology is that it helps managers

focus their attention on the large targets. Energy-conservation opportunities exist in most facilities, particularly large ones. But managers have limited resources, both in personnel to implement changes and in funding to cover the costs of the changes.

To get the biggest return for their investment, managers must start with the big-ticket items, those with the highest energy-use levels or that offer the largest potential for improvement. Without data quantifying the amount of energy being used in the facility, managers will have to guess which opportunities offer the greatest potential.

While the largest energy users within a facility, such as chillers, will be obvious, the room for improvement that is available in those systems might not be as obvious. Identifying those opportunities requires benchmarking the current system against system norms, and benchmarking performance requires data that submeters provide.

Verifying savings

One of the toughest problems energy-conservation programs face is verifying their accomplishments, which is particularly difficult in large, multi-building organizations where the savings produced by the implementation of a particular project get lost in the background noise of monthly energy-use variations.

Consider the energy use of a domestic-water booster pump system in a large health care facility. Most of these systems use constant-speed pumps to boost municipal water pressure to adequate levels for all areas within the facility. But the demand for water in health care facilities varies with the time of day and the activities taking place. With constant-speed pumps, the energy used to boost the pressure in the system does not vary much with water demand.

Installing variable-speed pumps does produce significant savings because the pump's energy use falls off rapidly with decreasing speed.

The problem for managers is verifying these savings. While significant, they rarely get noticed in the facility's bottom line, making it difficult for managers to obtain funding for additional energy projects. By installing submeters and tracking the system's performance before and after the conversion, managers can readily quantify the savings produced. Top management is more likely to provide additional funding if they have hard data on the success of past projects. ■

James Piper, P.E., is a national consultant based in Bowie, Md., with more than 25 years of experience with facilities management and maintenance issues.

Picking Candidates for Submetering

Implementing an energy-conservation program that includes submetering technology is an exercise in identifying equipment and systems most likely to have the greatest potential for savings. Some opportunities are obvious, such as central chillers and pumping systems. Others are not and vary based on the operations conducted within the facility and the types of equipment and systems installed. But managers can examine general categories of equipment for opportunities.

In educational facilities, potential targets for submetering include heating and air conditioning systems, pumps, lighting, food service, and research equipment. In commercial spaces, targets include these same items, as well as specialized equipment that supports the operation of tenants. The same goes for health care facilities, in addition to specialized medical diagnostic equipment, and air and vacuum systems.

Managers can work with front-line technicians and building occupants to identify energy-using equipment and systems that are promising candidates for submetering. Managers then need to prioritize the list based on such factors as total energy use and the potential for savings. Systems with known operating or efficiency issues should rank high.

Managers also can start a pilot program with one or more of the highest-ranked systems, using data generated by submeters to quantify the successes and to promote expansion of the program. But the primary benefit of a submetering program is information, and the process is not an install-and-forget operation. To be effective, managers must compile the information and review it regularly in order to make decisions that curtail facilities' energy costs.

— James Piper, P.E.

Project Management

Mississippi State University's multi-million dollar conversion of its central steam plant to high-efficiency hot-water condensing units was the university's first step toward saving more than $25 million in electricity and natural gas costs.

AN EDUCATION IN ENERGY

Mississippi State University upgrades its HVAC technology and learns lessons in maximizing the investments to benefit the bottom line

MISSISSIPPI STATE UNIVERSITY / MEGAN BEAN

By Dave Lubach, Associate Editor

Like many institutional and commercial facilities around the country, Mississippi State University faced growing utility costs in the mid-2000s that forced maintenance and engineering managers to find new ways to do more with less.

In 2006, the university, located in Starkville, set a goal to reduce its energy consumption by 30 percent per square foot by 2016. So far, so good. The university has saved more than $25 million in electricity and natural gas and is well on its way to reaching its goal. The success has resulted from a series of retrofit projects — most notably, converting its central steam plant to high-efficiency hot-water condensing units. The projects also have added variable air volume (VAV) systems to its buildings and introduced building automation systems to campus as time and budgets allow.

"It's been pretty well documented that doing these types of things over time definitely impacts your bottom line," says J.D. Hardy, the university's associate director of utilities and an energy and mechanical engineer in facilities management in 2008, when the project started. "The cost avoidance is energy we would have otherwise spent if we had not taken the initiative to implement these changes and operate more effectively."

Steam plant conversion

The first and most significant step the university took to reduce its HVAC-related energy costs involved the multi-million dollar conversion of the central steam plant to high-efficiency, hot-water condensing units. The steam plant served for years as the primary heat provider to almost 40 campus facilities with about 3.5 million square feet of space.

"Our steam plant was built in the mid-1920s and has a long history of providing heating and steam needs for the campus," Hardy says. "(The plant's) reached out with steam distribution through tunnels across campus, and with that type of distribution,

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MISSISSIPPI STATE UNIVERSITY / MEGAN BEAN

Mississippi State University is performing HVAC retrofits on all of its buildings to install building automation systems. About 80 buildings on the campus, which comprises 80-90 percent of the campus' square footage, have direct digital controls.

there have been a lot of advances made. Over time, a system like that can become quite inefficient, even with the best maintenance practices."

The engineering department played a significant role in the design and planning of the conversion. The engineering manager at the time helped specify the type and size of equipment required to replace the older steam boilers. In-house technicians performed most of the work, but some elements of the project required outsourcing.

"We don't outsource anything in terms of core maintenance and operations," Hardy says. "The reason we'll outsource on a project is, a lot of times, if you look at the work profile and a large project comes along, there's a peak of man hours and resources needed, and you're not going to staff up for one project."

The university replaced two steam boilers with 14 condensing, high-efficiency boilers. The old boilers operated at about 80 percent efficiency, while the new units operate at Btu ratings in the mid-90s. The university experienced a dramatic reduction in Btu per square foot since the new boilers were installed, lowering its electric and natural gas consumption from 162,000 Btu per square foot in 2006 to 102,000 by 2012.

"If you run the boilers in the right return temperatures and the right scenarios, you can find some real efficiencies, which is evidenced by the fact that our large-scale steam plant saw an 80 percent natural gas drop," Hardy says.

The university's approach to chiller upgrades differs somewhat from its approach to boilers. Because of the significant costs associated with buying chillers, the university bases its decisions on physical condition more than efficiency ratings.

"A lot of times, condition is the reason we replace a chiller," Hardy says. "Chillers can be pretty pricey. A very large centrifugal chiller that's 800,000 tons or more is a big investment. A lot of times on those units, at least as we've seen on the centrifugal, water-cooled systems, if you buy one off the shelves from major manufacturers, you're going to have a lot of performance improvements.

"But our infrastructure isn't so old that there is much of an efficiency bump. If you have a 30- to-40-year-old unit, then we would look at replacing it. Those things have a pretty long life cycle. The air-cooled units, a lot of times you put too much investment in them, it's expensive to go out and get something new."

Adding operating systems

The process of performing retrofits to curtail HVAC-related energy use also involves converting all campus buildings to building automation systems, which now are part of any new construction or renovation project.

"We have close to 80 buildings with direct digital controls, which comprise about 80 to 90 percent of our square footage on campus," Hardy says. "We've taken the control of a lot of our buildings to our central control system. We've had an aggressive campaign to request funds to allow our guys to go into buildings and


MISSISSIPPI STATE UNIVERSITY / MEGAN BEAN

The installation of an ice storage area at Mississippi State University is expected to save the university hundreds of thousands of dollars a year in electrical charges. The plant will produce ice at night, when off-peak energy costs are cheaper, during the summer months.

identify what it's going to take to rip out the old stuff and put in new digital controls. We've executed that ourselves, sometimes with a little bit of contract help. But we've pretty much run those projects and added a number of those buildings to the centrally controlled system."

One important reason for the success of the university's energy-conservation efforts is technicians' knowledge of these systems.

"It's clear to me that it starts with having the right people on your team in terms of technical ability," Hardy says. "HVAC techs, controls technicians, electricians, whoever it is — that's the No. 1 priority, having people who are competent and driven. If you give one control-savvy-type guy or an HVAC guy the latitude to go and make improvements, that one person can do more throughout their time than any number of huge projects.

"Our people are our No. 1 resource, giving them the freedom and resources they need to make changes and improvements. If we lose that, we'll start to lose ground."

The boiler upgrades and the increased role of building automation systems in campus buildings bring benefits to the university's maintenance and engineering operations in other ways besides the bottom line. The new equipment also results in means less supervision and observation is required at the steam plant.

"Because of the modernization of the systems, we've seen reduced operational interface with our operators, and it allows you to reallocate your resources elsewhere," Hardy says. "The boiler project was a good example of that, and the controls initiative allows you to be more efficient in how you diagnose problems.

"The new boilers require reduced maintenance and operator supervision and they've allowed us to shift that workload, from where we used to have a steam plant that was staffed for a 24-hour operation. We don't have to do 24 hours anymore, because we can monitor the equipment with the control system. We don't need nearly the operators we needed to babysit the older equipment."

VAVs also have contributed greatly to the university's energy saving story. The systems are requested by the university's engineering staffs as part of any new building or renovation projects.

"We've seen a big benefit from (VAVs)," Hardy says. "It allows you to ramp down the energy consumption of the building when you don't need it and ramp it up only in the areas where you do need it.

"When we find an old building that's not using VAV, we've tried to go in as we have time and money to add that functionality if at all possible. That's a technology we've really latched on to."

Savings on ice

The university has plans to squeeze even more savings out of its central plant. An ice storage area is under construction. The plant will produce ice at night, when off-peak energy costs are cheaper during the summer months, to meet the campus' chilled-water needs during the day when energy costs climb.

"There have been some adjustments in the calendar, but it's supposed to come on line toward the end of summer," Hardy says. "We're growing, so we had to add chilled-water capacity, and this is the most effective way."

The university anticipates saving hundreds of thousands of dollars a year in reduced electrical charges with the addition of the ice-storage plant in addition to the millions it's already saved.

"In a similar way that we say improved efficiency, reduced maintenance and operation needs with the steam to hot-water-plant conversion, we're anticipating similar benefits as we build capacity into our chilled water plant by adding the ice storage." ■

Product Focus

Door Hardware Retrofits: A Clear Path to Savings

Analysis, planning and a long-term view are essential elements in successfully upgrading key hardware components

By Thomas A. Westerkamp

Efforts to improve the performance of institutional and commercial facilities often focus on HVAC, plumbing and electrical systems. This mindset is understandable, given the role of these systems in improved energy efficiency and sustainability. But maintenance and engineering managers need to consider the benefits of upgrading facilities' doors and door hardware, including electronic security hardware because of their tie to the safety, security and comfort of facility occupants. By taking a closer look at these components and understanding key issues related to their performance, managers ensure doors and door hardware deliver long and cost-effective performance life.

A matter of compliance

Among the most complex challenges of door and door hardware upgrades is ensuring compliance with laws and standards. Consider accessibility. Title III of the Americans with Disabilities Act (ADA) requires that existing facilities remove architectural and communication barriers in public areas, but only if organizations can accomplish it with little difficulty and at a reasonable cost, as specified in ADA accessibility guidelines (ADAAG). Accessibility questions specific to door hardware include these:

- Does the entrance avoid stairs and curbs?
- Is it stable and firm with no trip hazards?
- Is it at least 36 inches wide, with no protrusions greater than 27 inches from the ground — to allow use of a cane — and more than 80 inches of headroom?

Solutions to such barriers to access can include: installing a ramp or curb cut; repairing the uneven surface or replacing it with a hard surface; and placing cane-detectable objects on the ground below the protrusion.

One important step in planning accessible upgrades is to conduct inspections. Doors are accessible if: they can operate with a closed fist; the handle position is not more than 48 inches from the floor; and opening it requires 5 pounds of force or less. Also, approaches should have 36 inches of clear space forward, and a 5-foot diameter or T-shaped space for wheelchair turns.

Building codes also are essential sources in planning successful retrofits. As technology changes, interested code bodies respond with updated accessibility, fire, electrical, mechanical, pipefitting, and structural codes. These resources contain updated information about ways to improve building value through better safety and security features, many of which also can help reduce costs.

Enhancing security

Upgrades to doors and door hardware also need to strike a careful balance between ease of entry and egress

DOOR HARDWARE

ASSA ABLOY

Wi-Fi lock

The IN120 is designed for hard-to-wire locations, using Standard IEEE 802.11b/g/n Wi-Fi connectivity to connect the access-control system. Wi-Fi connectivity cuts installation costs and the need for proprietary equipment. The lock's integrated ANSI/BHMA Grade 1 hardware is available in cylindrical and mortise-lock configurations. **Free Info: Circle 250**

MEDECO

Electronic cabinet lock

The battery-operated K100 with Aperio technology uses local wireless communication between the lock and hub to connect to an access-control system. The lock provides real-time monitoring of the door and latch-locked status with integrated door position, tamper, and low-battery signals. The unit includes two forms of battery-fail override. **Free Info: Circle 253**

KABA ACCESS & DATA SYSTEMS

Access-control kit

The AD102 kit is a standalone identity-access management system that includes a standalone controller and fingerprint key for biometric access control in a non-networked package. The kit supports up to two entry points with one reader. The kit's access-control application is embedded to eliminate the installation and maintenance of software and servers. **Free Info: Circle 251**

SECURITRON

Wireless reader

The R100 with Aperio® technology can mount on glass, stone, granite and marble entryways and extends the reach and application of access control when paired with a variety of hard-wired electromagnetic or electric locking devices. Installation requires no drilling or pulling of wires to the door. **Free Info: Circle 252**

CYBERLOCK INC.

Access-control software

CyberAudit Professional 3.0 offers streamlined reporting and notification capabilities, as well as compatibility with CyberKey vaults and Flex System input and output devices. It also provides activation for the Flex System door and input/output module relay device. Functions of the door and input/output module include locking and unlocking doors, arming and disarming alarms, and activating other relay-based devices. **Free Info: Circle 254**

and the security and safety of occupants and assets.

For example, retrofits that incorporate interchangeable core technology can help to upgrade security by replacing an interchangeable core with a master key. Then, issuing new keys and recording the location and new key holders in the department's database completes the process. Periodically changing lock cores, rather than the whole lock, is one low-cost way to ensure overdue or lost keys do not become a security issue.

Among the lessons from the 2012 school shooting at Sandy Hook Elementary School is the importance of assessing a facility's physical security. Delaying the entry of a gunman saves lives. High-security facilities use floor-to-ceiling turnstiles at entry points inside the outer entry doors and control them remotely. They are locked to prevent unauthorized entry and controlled by personnel behind bulletproof glass.

Several exit-device options can help managers enhance security. They include: a kit that fills the gap between an exit device and door to prevent wrapping chains around the device and locking people in or out; electrified latch-bolt retraction for specific periods; egress-delay sounds and alarm sounds that occur when anyone attempts a forced entry or exit; a combination audio/visual alert package that guides occupants to exit locations; and luminescent signage on exit devices that increases visibility of the exit location in dark or smoke-filled areas.

Bottom-line issues

One essential element of planning upgrades is understanding the performance lives of installed components and planning for their replacement. Managers can use this information on a product's certified life cycles, as well as knowledge gained from experience, to develop spreadsheets showing a facility's major doors and hardware components, typical life span, date of installation, and replacement year and cost. After finishing the spreadsheet, they can add the costs for all components requiring replacement in a given year for each year over the next 20 to 30 years.

These yearly totals are the amounts that must be available each year for replacement or retrofit. This approach helps managers avoid the panicked, last-minute search for funds to perform necessary maintenance, and it avoids borrowing from reserves set aside for other purposes.

Functionality and appearance

While retrofits of doors and door hardware improve ease of access and security, they also can enhance the area's appearance with a range of traditional and modern designs. Materials can vary from nickel and bronze to brass, chrome, plastic, stainless steel, or zinc, and finishes can include polished, brushed, and satin. ANSI/BHMA A156.18 includes a list of 102 material and finish combinations.

Retrofitted door hardware shows that owners regularly upgrade handles, locks, hinges, closers, and exit devices. Payback will result in the form of occupant satisfaction and increased asset value. LEED incentives are an added way to achieve a cost-effective retrofit. In the healthcare industry, LEED, Existing Buildings: Operations and Performance standards provide points toward certification for compliant door frames and door hardware that improve energy efficiency by just five percent.

Beyond installation

Door hardware manuals contain recommended maintenance steps and frequencies for components, so managers must incorporate these tasks into preventive maintenance schedules. Warning signs of maintenance problems include: leaks around closers, door scraping against frames; sagging that causes uneven gaps around doors; cold or hot air leaks; latches and strikes that do not engage or scrape; loose hinges; loose door frames that move when the door opens or closes; and handles that stick or need to be pushed to open.

Checks of these components, in addition to keeping hardware working properly, offer an opportunity to look for retrofit upgrades, not just a replacement with the same product. Is a component failing before it should? Is it difficult to operate? Do the door and hardware require an ADA retrofit? Is there an opportunity to reduce or consolidate door and hardware components during the next retrofit? Keeping records of each preventive maintenance round can save time and aid in recalling these opportunities when the time comes to plan the next retrofit. ■

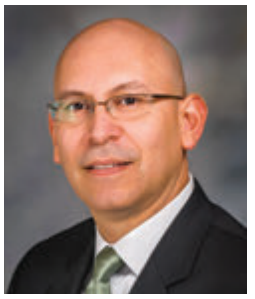
Thomas A. Westerkamp is a maintenance and engineering management consultant and president of the work management division of Westerkamp Group LLC.

CMMS

Need more reliable data from your CMMS? Planning to upgrade it soon? Managers discuss their CMMS performance strategies

David Adcock, Director of Facilities, Riddle Memorial Hospital, Media, Penn.

Frank Lucas, Assistant Director of Work Management, University of Nevada, Las Vegas



Oscar Rangel, Property Manager, MD Anderson Cancer Center, University of Texas at Austin

By Dave Lubach, Associate Editor

Maintenance and engineering managers need accurate, comprehensive data about their facilities in order to deploy their resources effectively. To achieve this goal, managers in institutional and commercial facilities rely on computerized maintenance management systems (CMMS). In this roundtable discussion, three managers discuss the strategies and challenges of maximizing their departments' CMMS.

[Q] How long has your department used a CMMS? Are you satisfied with it?

ADCOCK: We've had our current version since about 2003, and we're very happy with it. We had a different version prior to this, and it wasn't as user-friendly as the current product we have. I searched out some new technology, and the first thing I did before I purchased it was test drive it. It came with a sample database, and I fooled around with it for a couple of weeks to make sure it fit our needs. Once I saw how easy it was to utilize, I purchased it and implemented it for our facility.

LUCAS: We implemented it on March 21, 2002. The system has done everything we needed it to and then some. We've made extensive use of its features and functions and done some interfacing with other systems, like homegrown applications and custom electronic routines designed to share information. We manipulate financials with the CMMS, and it helps us do more with less while increasing data-entry accuracy. It's really played an integral role in our operation.

RANGEL: Our organization purchased a CMMS in 1998. The initial rollout of the software was not very good, which led to low satisfaction ratings and little or no use. Changes in management in 2006 led to a renewed effort to again roll out the software, with much greater success and clearer standards to follow.

[Q] What benefits has the CMMS delivered?

ADCOCK: Probably one of the bigger things is it gives us improved control over our assets throughout the building, and introducing building automation systems. We have better control over those assets. We also have an improved equipment-management system, so we can set up tasking and issuing work orders and work tasks. We can do either as a scheduled work order or like a critical repair that is a priority-level work order we have to do right away.

RANGEL: A component of the 2006 rollout was the development of specific support roles that would be responsible for work-schedule creation. One of the new positions created was that of planner scheduler. The planners were responsible for developing work scopes, identifying materials and creating weekly work schedules for every technician in their craft group. The result was an increase in equipment reliability, improved customer satisfaction and lower backlog.

LUCAS: We are a state institution whose funding is based on a square-foot formula. The formula for administrative employees would normally allow us to hire two more full-time equivalent workers than we currently have, but due to the recession and all the other cuts, we were forced to cut back. But due to our strong use of the web request portion of our CMMS, it's helped reduce phone calls. Overall, it's resulted in a labor savings of approximately $125,000 a year. We've actually been able to process more requests with fewer employees.

[Q] How has the CMMS changed the way the department collects, analyzes, and uses data?

RANGEL: Having our CMMS has allowed our organization to establish uniform methods of how data is collected and extracted. Our organization created a central call center that receives all service requests via e-mail, phone or fax. The use of a central call center helps ensure that data in our system was entered uniformly, which later facilitates data extraction. Through careful examination of data and attrition, our organization improved employee productivity by 20 percent.

LUCAS: The wealth of historical information has helped us make some great decisions. Every time we consider spending funds on a project or campus improvement initiative, we always calculate a payback to determine if such a course of action makes good economic sense. This historical data we've collected and stored in the CMMS assists us in making these determinations. We also use the data in the form of a variety of reports and performance metrics to compare ourselves to similar organizations and, most importantly, to our own past performance to see where we excelled or where more attention is needed.

ADCOCK: This product has a report function, so we can go in there and track if we're getting excessive callbacks. By attaching a specific asset to a space or a particular piece of equipment, you can track how much work we're doing in there. If we're getting excessive heating calls in a particular area, we can look back and say we have had multiple calls in the last couple of weeks — something in addition to a normal failure going on. It allows us to do a lot of trending for various types of calls so we'll know not only callbacks but also how many callbacks we're getting in a specific timeframe.

[Q] What challenges has the department faced in maximizing the data collected?

LUCAS: As so often happens with us, we seem to be victims of our own success.

For a complete version of this Roundtable discussion, visit www.facilitiesnet.com/fmd

In the cases of information collecting, our information is often so good that others want it. With these demands come having to make time and expand the availability of our custom reports and queries and create custom interfaces to other systems that require a steady flow of information. A great example of this is grant applications, where the cost of maintaining a specific space is often part of an overall request for research funds.

ADCOCK: Some of our challenges were getting all the space assets and all the equipment assets loaded into the systems, first and foremost. Probably one of the other challenges as time goes on is adding new assets and deleting old ones.

RANGEL: Data collection and retrieval is a key indicator of whether a CMMS is going to be useful in helping an organization identify opportunities for improvement. Our organization's CMMS was not set up with any type of data-collection system, so we rely on technicians to manually document how long and what they did on each job they complete on a daily basis. This information is entered daily into our CMMS, which while effective, still relies on a data-entry person. A more ideal solution would be to have a system that is designed to support devices that allow technicians to make updates.

[Q] How has mobile CMMS technology affected productivity?

ADCOCK: One of the things we've done is added a tablet-type PC. We've integrated that into the system and had it for about two years now. I have a life-safety technician who is able to go around and handle all the different life-safety and Joint Commission inspections with his PC. Our maintenance software allows for us to utilize an iPad, so it's something that I will change us over to and start e-mailing more work orders, as opposed to a dispatcher issuing a work order and sending technicians to a particular call.

RANGEL: Our organization is currently investigating which mobile technology will best support our needs to collect data, make information such as prints available to technicians, and facilitate preventive maintenance rounds. Devices such as iPads, handheld scanners, and tablet PCs are under consideration.

LUCAS: We were kind of late getting into the mobile market, and the reasons were pretty simple. Mobile devices were evolving and changing at a very rapid pace the last 10-15 years. A device that became lost or defective could seldom be replaced with the same exact device, and often the newer version wasn't compatible with the CMMS or the current operating system in use or worked with limited functionality. So we held off on implementing mobile technology solutions until recently. Now that smartphones and tablet technology has somewhat stabilized, we're starting to deploy mobile devices on a limited basis where it makes sense to do so. Tablets have been recently integrated into our warehouse operation that will assist with day-to-day duties, as well as year-end inventory.

[Q] If you were to replace your CMMS, what features and functions would be the highest priority?

ADCOCK: I think our current program probably has everything we need now and probably moving into the foreseeable future. If I were going to change, I'd probably want a product that was geared towards health care. One of the other things is making sure it's competitively priced and user-friendly. User-friendly is a big point because anyone has to be able to go out there and utilize the program with minimal experience.

RANGEL: Two key factors that would influence the selection of a replacement would be how well could the CMMS interface with existing personnel and accounting software being used by our organization, and what mobile devices can the CMMS support?

LUCAS: We're happy with our CMMS, but we're always looking ahead to the day when we might need to replace it. Overall, gaining more efficiency using web and mobile technology is what I'd be looking for, expanding the role of a CMMS to alert the user to rules and process exceptions, and customization of pop-up messaging and duplicate detection. They would be very important considerations for me when I go out to find my next system. ■

ROOFING

Solar Situation: Roofing, Photovoltaics and Maintenance

As rooftop solar-energy systems gain popularity, the issues for managers and staffs multiply

By James R. Kirby

Rooftop photovoltaic (PV) installations continue to increase as institutional and commercial facilities become more aware of the potential for on-site electricity production. But what happens after the PV installation is complete? What issues do maintenance and engineering managers need to address related to maintenance of the roof system and the PV system maintenance?

By exploring the who, what, when and how of roof and PV system inspection and operations, managers can ensure the organization's investment in the technology pays the desired dividends.

Essential maintenance

Roof system maintenance creates two basic requirements for managers and their staffs. First, know the roof system. Second, perform maintenance regularly.

Knowing the type of membrane and system components ensures workers use the proper materials and methods during maintenance and repairs. Roofing components can look similar but require different techniques to repair, and membranes are not always compatible with all repair materials.

Regular maintenance can help workers find and repair problems in a timely, cost-effective fashion. Small leaks, if not repaired, can become large leaks that damage a roof's components. The same mind-set is true for a rooftop PV system and its maintenance: It is essential to know the specifics of the system and to perform regular maintenance.

While roofs and PVs do not have moving parts, they do require maintenance because they have seams, flashings, and mechanical and electrical connections that workers should inspect. Seams adjoining membranes and flashing components need to stay tight and weatherproof. Temperature fluctuations cause all materials to expand and contract, adding stresses to seams, flashing locations, and mechanical connections. PV systems' racking components also expand and contract, which introduces stress into racking-to-panel connections and racking-to-roof system connections.

Inspection insights

The roofing industry recommends that workers perform maintenance in spring and fall, as well as after major weather events, such as high winds and snowstorms with freezing rain. Routine roof maintenance primarily involves visual inspection of the roof system and rooftop PV system. Roofing professionals who are familiar with the roof type can determine if components need repairs. A typical visual inspection includes walking the roof perimeter to inspect the edge detail, whether it is a parapet or a flat edge, and walking the roof field to inspect each penetration.

Provided by:
The Center for Environmental Innovation in Roofing

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A comprehensive roof inspection also can reveal soft spots, which indicate deterioration and likely require more investigation and repair. The additional investigation might involve destructive testing — making an opening for closer inspection — or non-destructive analysis, such as infrared scanning.

Roofing professionals should perform routine maintenance and repairs to membranes and systems, and it is important to have an authorized roofing contractor perform maintenance and repairs to a system that is under warranty. In-house personnel can perform basic roof maintenance, such as clearing debris from drains and ensuring the rooftop does not collect refuse or infrequently used materials and equipment.

While it is essential for managers to know about the roof-membrane type, knowing the makeup of the system is just as important. For example, if a system includes an air barrier or vapor retarder, then maintenance and repair of the system, no matter how localized, needs to include all system components, and they need to be appropriately tied-in. Managers can help contractors provide more effective service by knowing and providing this type of information.

When it comes to maintenance of PV systems, non-roofing experts can unintentionally do damage to roof systems by dropping tools or continually walking the same path, especially around the perimeter of the PV system. Installing walk pads is an inexpensive solution to roof membrane abrasion from foot traffic.

Maintenance of rooftop PV systems is similar to roof-system inspections in that visual inspection is a necessary first step for long-term performance. A visual inspection of a PV array ensures it is structurally sound. Maintenance of the array, including the panels and racking, should involve the visual inspection of panels, mid-panel clips, end clips, wiring, and racking. Inspectors also should check the undersides of panels to ensure animals have not disrupted wires by building nests or chewing on them.

A visual inspection of PV panels also can reveal whether workers need to remove dust and other debris, such as leaves and bird droppings, from the top surface. Keeping the panels' top surfaces clean allows the most sunlight to reach them, creating the most energy possible.

Design role

Maintenance and engineering managers are uniquely qualified to provide specific information about the building and rooftop that are critical to post-installation activities, so they should get involved with the design process for the roof system and the PV system. Doing

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so can pay dividends in terms of maintenance and repairs.

For example, proper design of the roof and PV system results in accessibility to critical components, such as drains that need to remain clear and mechanical units that require filter changes. It would be impractical if a PV installation blocked access for maintenance and repair of air conditioners, antennas, skylights, roof hatches and drains.

One issue managers must pay close attention to is roof penetrations. Many rooftop PV installations are touted as non-penetrating because system manufacturers want to reduce the potential for leaks from improper penetrations. But ballasted, non-penetrating PV systems require at least one penetration to bring electrical conduit into the building.

Managers also need to ensure that ballasted racking systems are secured for two reasons: wind and abrasion. A few strategically placed physical attachments can improve the wind resistance of a PV array. It also is important designers use physical attachments to prevent abrasion of a roof membrane for installations using non-penetrating racks. Properly located attachments can prevent movement of the racking system and resulting membrane abrasion.

Fine-tuning the process

Daily monitoring of the PV system's electrical output also affects maintenance. This process is not a rooftop inspection. Instead, it is done by computer. By monitoring the system's output and noting deviations, managers can determine if an array is functioning properly.

Besides planning for maintenance, managers also need to notify the local fire department that a photovoltaic system is in place on a building. Local fire codes might include requirements for ladder placement and rooftop access. It is best to follow the International Fire Code (IFC) 2012 Edition for requirements for placement of rooftop PV systems. The IFC aims to maximize the safety of fire fighting personnel, as well as the ability to control and extinguish a fire.

It also is prudent to notify the facility's insurance carrier. Adding a rooftop PV system might trigger requirements or insurance riders, as well as increase the building's overall value. Updating the policy is a good idea when organizations make major changes to a building.

Finally, managers need to make sure building owners, architects and contractors understand that roof and PV system maintenance is critical for ensuring the long-term performance of these two important building components. ■

James R. Kirby, AIA, is vice president of sustainability with The Center for Environmental Innovation in Roofing — www.roofingcenter.org — which is headquartered in Washington, D.C.

Spotlight: CEIR

The Center for Environmental Innovation in Roofing (CEIR) is focused on developing and expanding RoofPointCM, the only rating system for environmentally friendly roof systems. RoofPoint includes 23 credits within five strategic categories — energy management, materials management, water management, durability/life-cycle management, and innovation in design. Energy management and durability/life-cycle management account for two-thirds of the credits, illustrating that energy efficiency and a long service life are important components to sustainability of roof systems. More information is available at www.RoofPoint.org.

The center's PV Taskforce has published a number of documents that provide high-level thought guidelines about rooftop PV installations. The taskforce has developed PV racking and attachment criteria for all low-slope roof systems, including sprayed polyurethane foam (SPF) and low-slope metal panel roof systems, and it is developing criteria for asphalt-shingle roof systems. More information is available at www.roofingcenter.org/special/PV.

For more information on the center's role as an industry advocate, contact the staff at info@RoofingCenter.org.

— James R. Kirby

THE TORO CO.

Managers have a growing range of options to consider when specifying riding mowers, from stand-behind units and seated models to riding tractors and utility vehicles equipped with mowing decks.

Specifying Mowers with **Manufacturers as Partners**

Equipment makers can serve as resources for managers sorting through the options

By Dave Lubach, Associate Editor

Grounds managers with institutional and commercial facilities have an ever-growing range of options to consider when specifying riding mowers. From stand-behind units and seated models to riding tractors and utility vehicles equipped with mowing decks, manufacturers offer an array of alternatives for managers to consider.

The process becomes more complex when managers consider factors such as fuel options, riding comfort, turf considerations and sustainability. Working closely with the mower manufacturer can help managers make a smart equipment decision that delivers all of the intended benefits to the department.

"Engaging a manufacturer, or the manufacturer's dealer, in a conversation specific to the facility's needs will allow the opportunity for the manager to be paired with the right piece of equipment," says Gent Simmons of the Husqvarna Group. "The many different makes and models all have their purpose, and there's a perfect one specifically for your needs.

"Additionally, manufacturers can assist in training staff and provide useful research tools, whether that is online reviews, product marketing materials, or testimonials that can help end-users make an informed decision on a purchase."

Developing a strategy

Establishing a long-term acquisition strategy is a good first step for managers as part of a mower-purchasing program, says Kevin Conry of The Toro Co.

He adds that the key components of such a program are: replacement schedules for existing equipment; a multi-year capital equipment budget; an operational spending budget framework for parts, maintenance, fuel, labor, and financing; approved financing methods; outsourcing considerations; and an established plan for storage, transport, and protection of equipment. Knowledge of regulations, such as local ordinances and U.S. Environmental Pro-

The amount of acreage, the type of terrain, and the presence of obstacles such as flowerbeds, trees, and passageways all contribute to the purchasing decision when specifying riding mowers.

JOHN DEERE

tection Agency emission standards are also critical in the decision-making process.

"Managers tend to overlook long-term acquisition strategy and understanding of operational costs for equipment based on maintenance schedule and productivity analysis," Conry says. "And during the site assessment, they fail to investigate alternative ways to complete the tasks."

Mowers are one of the most costly investments managers must make, so it is not a decision to take lightly.

"How much money do they have to spend, and how many people can they do it with?" asks Nick Minas of John Deere. "That will always be the limiting factor. Maintenance budgets are getting constricted across the board. That will always be the big dog in terms of what's the limiting factor.

"If you only have two people and 50 acres, that's really going to affect the kind of machine you're going to use. But if you have 50 people to maintain one acre, it changes your dynamic."

While budget considerations obviously play a significant role in a mower-purchasing program, managers must consider other factors beyond the bottom line.

"The budget plays a large role in what equipment managers are able to purchase," says Brent Dobson of Grasshopper Co. "In today's market, managers are making great strides in sustainable equipment, and in most fleet operations, training is key to a well-running grounds department. So it's really a connection of all three elements coming together in the purchase of new equipment."

Turf considerations

After managers establish a budget for a pending mower purchase, the next step is to assess the characteristics of mowing areas to determine the machines that best match the facility's needs. The amount of acreage, the type of terrain, and the presence of obstacles such as flowerbeds, trees, and passageways all contribute to the purchasing decision.

"Managers must understand the variety of tasks required for different jobs," Simmons says.

"Having the right equipment is of the utmost importance when it comes to maximizing time and effort for any job. The managers should be able to identify and implement the most efficient use of equipment and staff to get jobs completed safely and efficiently."

Manufacturers also can assist managers in developing more efficient mowing practices.

"Evaluate all properties being mowed and determine the mowing practices that are working and identify areas of improvement," Dobson says. "Is there a more appropriate mowing practice for specific applications, such as side discharge, mulching, rear discharge, collection or a combination?"

Bonus Info

- **Managers should ask for several references or look to peers for honest feedback when seeking a vendor.**
- **Managers must ensure that in-house technicians can provide routine maintenance and small repairs as recommended by the manufacturer.**
- **Due diligence is essential when researching aftermarket parts. Not all parts are a value.**

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Managers also might be able to take advantage of a manufacturer who offers to tour a facility's grounds in advance of a purchase.

"We go in and do a complete overview of the products they're currently using," says Allen Baird of Cub Cadet. "I'll do a walkthrough of the campus and see what they're doing to get the job done, and if it can be done more efficiently or with another product. Some of the grounds managers base their day-in and day-out jobs on what they've done the last five or six years. But we go back to the beginning of how you maintain the product, how it's run, the efficiencies, attachments and the accessories to determine how we can deliver a solution for their toughest jobs on campus."

Fine-tuning the process

Preventive maintenance for mowers often is put on hold or even ignored, given departments' many other duties, but that decision could negatively affect equipment performance and the department's bottom line.

"Managers should always be willing to calculate the costs and benefits of running certain equipment configurations in an effort to maximize their productivity," Simmons says. "Often times, managers overlook basic preventive maintenance simply because the task gets lost in the daily grind. However, it is not best to run a product into failure, but to proactively maintain equipment. This way, lost time is limited and managed effectively, because the manager has a complete working knowledge and history on each piece of equipment. A small loss of time and convenience maintaining a machine today can save thousands of dollars in repair or replacement in the future."

Manufacturers can assist in training mechanics and operators and provide useful research tools that can help managers make informed decisions on equipment purchases

As managers explore ways to do more with less, they need to consider products that crews can use year-round.

"A mower that can not only mow but switch to an aeration implement or snow-clearing implement adds value in that the entity can get year-round use without buying several pieces of equipment with multiple engines to maintain to perform the same tasks," Dobson says. "Value-added features are also related to transmissions, engines, ergonomics, and frame and deck construction. Many of these value-added features separate true commercial mowers from flashy marketing gimmicks because these features extend past the price."

Staffing and training

Changes in department staffing also can affect mower specification decisions.

Securing a reliable service and support plan has become increasingly important for maintenance staffs, which frequently are understaffed to the point of being unable to perform tasks such as oil changes, blade sharpening, and tune-ups.

"As budgets are getting tighter on campuses, they're looking to basically minimize or even eliminate garage maintenance on site," Baird says. "So those employees that were used frequently during maintenance periods are now being utilized to maintain those challenging areas on campus that were only done by the very skilled operators."

Finally, the skill level of operators goes a long way in determining the kinds of mowers and training programs necessary to achieve maximum levels of efficiency and safety.

"What is the operator's skill level?" Minas asks. "Are they experienced, or have they done this for years? Or are the operators college interns that have never operated a piece of mowing equipment in their lives, and you have to take two weeks to train them on the equipment? That all has to be taken into account." ■

Trending NOW

[Sustainability Goals]

In re-evaluating its grounds maintenance program, the Maize Unified School District 266 identified two primary goals: reducing man-hours for greater efficiency and reducing fuel consumption and overall emissions for sustainability.

Fortunately, the school district in Maize, Kan. — a suburb in the northwest corner of the greater Wichita metro area — found that deploying a fleet of five Grasshopper MaxTorque™ clean diesel mowers would help it achieve both while generating significant savings and enhancing the appearance of nearly 100 acres of district properties.

"After we purchased our first diesel mower, we were able to see how its efficiency could impact our overall green initiatives," says James Baker, assistant superintendent of operations.

Compared to the district's previous gasoline equipment, the Grasshopper diesel mowers provided 50 percent more power with half the fuel usage. In addition, overall emissions related to mowing for the district took steep declines: a 43 percent reduction in non-methane hydrocarbons and nitrogen oxides, and a 99 percent reduction in carbon monoxide.

When combined with other energy-saving steps, including bus heater conversions and energy efficiency monitoring systems in district buildings, USD 266 realized a collective savings of more than $1.5 million over four years. The results were so impressive that the district was awarded a Clean Air and Sustainability Award by the City of Wichita and its Metro Air Quality Improvement Task Force.

"Of course, we were proud to accept the award, and we'll continue our commitment to improving sustainability," Baker says. "The best part is, given cuts in other areas, these savings not only help the environment but also help us keep more funds in the classrooms."

In addition to boosting the district's sustainability efforts, the Grasshopper fleet also helped reduce man-hours significantly throughout the year. Grounds manager Kevin Smith says he is most impressed by the outfront mower decks' ability to get in and under the low-hanging branches of the many cedars and pines that dot district properties.

"We've been able to eliminate most cleanup trimming time," Smith says. "If we didn't have the Grasshoppers, we'd be out there trimming around trees for two whole days."

Visit grasshopperfuelsavings.com to find out how much you could save by switching to Grasshopper MaxTorque™ diesel mowers.

In addition to mowing, all five mowers are equipped with dozer blades for snow removal.

"They are great at snow removal," Smith says. "They definitely save us man-hours, regardless of what we use them for."

Smith says switching to Grasshopper diesel mowers has also saved the district with regard to maintenance and repair costs, which have declined significantly. When repairs are needed, the commonality of parts and ease of service make the process simpler and more cost-effective.

"These mowers are built for longevity. They're built tough," he says. "We're running six or more hours every day, which is hard on any piece of equipment. But they still run like they did the first year we bought them. From where I sit, the Grasshoppers are the best mowing equipment we've ever used."

I drive a pickup to work, not a hybrid.

I do love trees. I'm just not a hugger. Don't get me wrong, I care about the environment. I mean, how couldn't I? I'm the one in charge of keeping the trees pruned, the grass cut and public spaces all around town looking spectacular. Then again, I care about a lot of things. Number one on my hot list these days is how I'm going to be able to continue operating with shrinking budgets for equipment and crew. So when my Grasshopper dealer told me about how their fuel-injected diesel engines could save my department literally tons of fuel AND put dramatically fewer emissions into the air we all breathe, I was all ears. After a test ride, a night's sleep and kicking it around with my crew, I decided to give it a shot. And after a summer of flawless cuts with minimal downtime, and thousands of dollars of fuel savings, I became a true believer. Just like my trusty old pickup, my instincts didn't let me down.

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FREE INFO: Circle 422

Trending NOW

[Introducing the New Club Car Carryall Tank-like Durability. Truck-like Performance.]

In 2011, Club Car decided it was time to give our customers a new generation of Carryall® utility vehicles designed to outwork, outperform and outlast anything on the market.

We began by launching a global listening tour to determine what the people who actually buy, drive and maintain utility vehicles liked and disliked about various manufacturers' vehicles, and what they wanted to see in new ones.

This Carryall 300's unique bed box features a configurable track-based attachment system with optional ladder racks and other inventive accessories.

With a whopping 1/2 ton total capacity bed that's nearly six feet (179 cm) long, the Carryall 700 will win your fleet's iron man contest hands down. And, with best-in-class ground clearance and turning radius, it navigates rough terrain and tight spaces with ease.

When it came to reliability, their message was loud, clear and unanimous: hands off the Carryall's rustproof, corrosion-resistant aluminum frame, body and bed.

So we retained the Carryall's renowned chassis. To that we added more automotive-quality components to increase reliability and meet the needs of today's customers.

Get Ready for the Road Ahead

By partnering with Club Car now, you'll be positioned to take advantage of additional innovations, breakthroughs and solutions we'll be releasing in the months ahead. Stay tuned. There's more to come.

The rustproof aluminum bed box now comes standard with Rhino® Lining, a tough, long-lasting material used in the beds of many pickup trucks. This makes the new Carryall even more durable than former models.

1,000 Jobs. Only one Carryall.

Need to paint in the morning, haul sod at noon, run security at night? No problem.

The rustproof aluminum side panels on the Carryall's bed box accommodate a configurable, removable, track-based attachment system for carrying shovels, rakes, leaf blowers and other equipment. This keeps crews organized, frees space in the bed and lets crews finish even big jobs in a single trip.

More Powerful, Fuel-efficient Engines and an Extended Warranty

Customers wanted a vehicle that bridged the gap between expensive pickup trucks and more fuel-efficient utility vehicles.

To meet their needs, 2014 Carryalls feature a sophisticated overhead cam (OC) engine with electronic fuel injection (EFI) that boosts horsepower by 30 percent and fuel efficiency by as much as 50 percent over previous models.

We are so confident in this engine that the warranty on the new gasoline Carryalls has been expanded from a two-year/2,000-hour to a three-year/3,000-hour limited warranty. You can't beat it.

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We have also increased charging efficiency and reduced the risk of uncharged batteries and stranded crews.

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To learn more about the new Carryall utility vehicle, visit www.clubcardealer.com/hardworkinghero or call your local Club Car dealer.

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RIDGID® Announces micro LM-400 Advanced Laser Distance Meter

RIDGID® announces the micro LM-400 Advanced Laser Distance Meter. Capable of reading distances up to 229 feet, it features a Bluetooth® connection to smartphones and tablets to view, store and share data. Along with the ability to overlay measurements onto a photo or sketch via Android® and iOS® Apps, it features a backlit, four-line display screen and inclination angle measurement for indirect measurements in hard-to-reach areas.

www.RIDGID.com

FREE INFO: Circle 154

Polaris® BRUTUS™ HDPTO

Polaris BRUTUS HDPTO equips facility professionals with a full, front-end PTO system powered by a 24-horsepower diesel engine. The in-cab joystick controls operate a complete line of commercial attachments including a snow blower, finishing mower, angle broom, snow blade, materials bucket and pallet forks. Hydrostatic transmission, On-Demand True All-Wheel Drive and a treadle pedal make BRUTUS ideal for commercial applications. The fully-enclosed cab with in-dash heat, defrost and air conditioning provide year-round user comfort.

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FREE INFO: Circle 152

Watco Manufacturing Universal NuFit®

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The Universal NuFit® from Watco Manufacturing makes old drains look new in minutes. The Universal NuFit® fits all standard bathtub drains, resists corrosion, is available in nine designer finishes, features a high flow grid strainer to prevent hair clogs and is a breeze to install. It is available with or without matching overflow plate and with Push Pull® or Foot Actuated stopper. This innovative product was selected by This Old House magazine as a Top 100 Household product of 2013!

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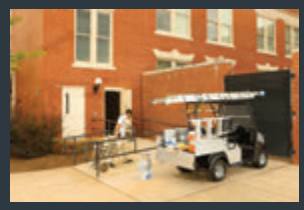
Watcomfg.com

FREE INFO: Circle 155

Carryall 300 Painter



The Carryall 300 utility vehicle's unique bed box features a configurable track-based attachment system with optional ladder racks and other inventive accessories. This frees room on the bed for other supplies and keeps painters organized and rolling.

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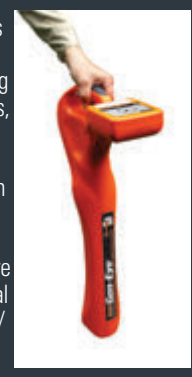
FREE INFO: Circle 150

General's New Gen-Eye Hot Spot™ Pipe Locator Makes Locating Easier



The new Gen-Eye Hot Spot™ pipe locator makes locating easier than ever. On-screen icons lead you right to your target, without the long learning curve. You can quickly locate inspection cameras, sondes, active power lines and utility lines with pinpoint accuracy. The auto backlit LCD display shows you the way with arrows that point you in the right direction every time. This rugged locator is rated at IP65, it is dust and dirt proof, and water resistant. For a free demonstration or more information, contact the Drain Brains® at General at (800) 245-6200, or visit: www.drainbrain.com/hotspot.

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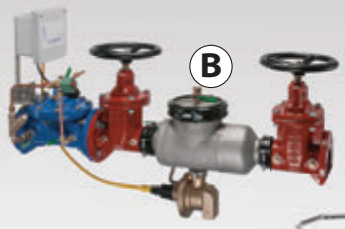
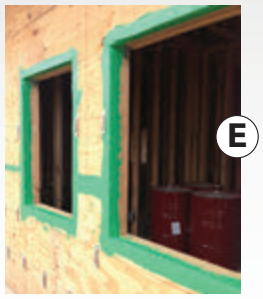
product pipeline





A CREE INC.
LED luminaire
The CXB high-bay unit delivers 23,000 lumens with a 70,000-hour lifetime rating and is designed to replace fluorescent and HID luminaires in education, warehouse and commercial applications. The luminaire's design reduces energy consumption by one-half and significantly reduces maintenance costs. The luminaire is lightweight and offers versatile mounting options for one-for-one replacement of up to 400 watt HID fixtures and multi-lamp fluorescent high-bay luminaires. **Free Info: Circle 200**

B ZURN INDUSTRIES LLC
Flood-control system
The Wilkins integrated system bundles three separate components that detect and shut down discharging backflow preventers installed in mechanical rooms or other indoor spaces. The system shuts off water supply to the backflow and can be configured to signal the alarm panel or divert water to another device. The system features reduced-pressure-principle assembly with integral relief-valve monitors, an electronic solenoid timer that processes signals from flood-sensing equipment against a settable time function, and a solenoid-actuated automatic control valve that shuts off water through the system. **Free Info: Circle 201**

C E-MON
Energy monitor
The Multi-Mon is a three-phase, multi-function demand meter that provides energy-efficiency and monitoring capabilities for facilities. One metering unit can monitor any combination of single- or multi-phase inputs totaling 36 channels. This feature permits configuration of up to three dozen single-phase, 18 two-phase, 12 three-phase or other load combinations. The meter is available with solid- or split-core current sensors for optimum installation flexibility from 100-1,200 Amperes. **Free Info: Circle 202**

D HERKULES EQUIPMENT CORP.
Post lift
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E W.R. MEADOWS INC.
Liquid flashing
Air-Shield is an elastomeric, polyether liquid-applied flashing and detailing membrane that bonds to most construction materials, such as aluminum, brick, concrete, wood, vinyl, and exterior gypsum board. The general-purpose, wet-flashing membrane is used to seal rough openings and detail joints between exterior gypsum boards. The flashing is designed for window and door applications and should be used as liquid-applied flashing. **Free Info: Circle 204**

F GOODWAY TECHNOLOGIES
Chiller tube cleaner
The Ram-Pro-XL®'s rotary tube cleaning and TubeGuard® technology helps eliminate biofilm and protect tubes against corrosion to improve HVAC system efficiency. The cleaning procedure clears biofilm, scale and other contaminants from the interior walls of chiller tubes. The unit features quick-connect shafts and brushes, a powerful motor with adjustable shaft rotation, integrated water flush and roll bar support to protect the equipment, and an integrated two-wheel dolly. **Free Info: Circle 205**

G THE GARLAND CO. INC.
Roof coating
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AD INDEX

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product pipeline

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I RIDGID
Pipe cutter
The 238-P operates using a one-half-inch-square impact driver or ratchet. The tool can cut 8-inch diameter thick soil pipes when used with an impact driver or 4-inch thick pipes when used manually. The tool is 11½ inches long, weighs 13½ pounds, and includes a removable handle and low-profile cutter wheels to fit into tight places. The tool's facing chain hook lays on top of the pipe for easier latching, and two-directional cutting allows for a cleaner cut. The tool is protected from overloading by a torque limiter. **Free Info: Circle 208**

J LEGRAND
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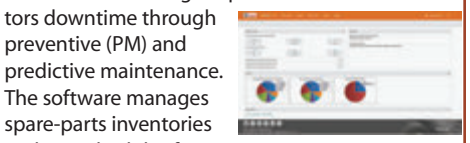
The 125-volt (V) Pass & Seymour® UL-grade chargers are available in 15 and 20 Ampere versions and feature 3.1 USB charging capability. The combination AC duplex tamper-resistant receptacles contain a patented shutter system that prevents the improper insertion of foreign objects as well as twin 5 V DC USB charging ports that work with 2.0 and 3.0 compatible devices. The receptacles feature stainless steel auto-ground clips to assure positive ground, zinc-plated ground terminal screw, as well as triple-wipe brass contacts for lasting retention. The screw-pressure-plate back wiring makes for easier installation. **Free Info: Circle 213**

CMMS

TMA SYSTEMS
Mobile CMMS
WebTMA GO gives technicians and supervisors the ability to work in the field with Apple iOS technology by taking advantage of the iPad's technological advances. The high-resolution camera allows the software's barcode-scanning capability to further increase data accuracy and staff productivity. The software can operate online or offline. The software is network compatible, including Wi-Fi or cellular data to connect to the database. **Free Info: Circle 209**

CYBERMETRICS CORP.
Maintenance management software
FaciliWorks CMMS is available in desktop, web-based, and hosted versions. The software features include: tracking, analyzing and reporting on facility assets; maintaining preventive maintenance schedules and service requests; and managing work order procedures, personnel issues and purchasing records. The software has an upgraded look and helps users by maximizing asset uptime, mobilizing departments, assuring standards compliance and reducing costs. **Free Info: Circle 210**



SMARTWARE GROUP INC.
Cloud-based CMMS
Bigfoot CMMS maintenance automation solution software manages operations and monitors downtime through preventive (PM) and predictive maintenance. The software manages spare-parts inventories and PM schedules for routine safety tasks with occupational safety and health solution software, *Bigfoot OSH*. *Bigfoot OSH* provides a set of safety incident and audit features, allowing users to create, monitor, schedule and review facility safety programs and record incidents. **Free Info: Circle 211**

MICROMAIN CORP.
CMMS
The updated version of the maintenance management and mobile software includes enhanced document handling from mobile devices, improved e-mail notifications for work requesters and mobile users, the ability to create demand work orders from a mobile device, streamlined multi-labor closeout, and automated scheduling of preventive maintenance tasks. **Free Info: Circle 212**

For more information on CMMS, see article on page 14

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TUESDAY, MARCH 4

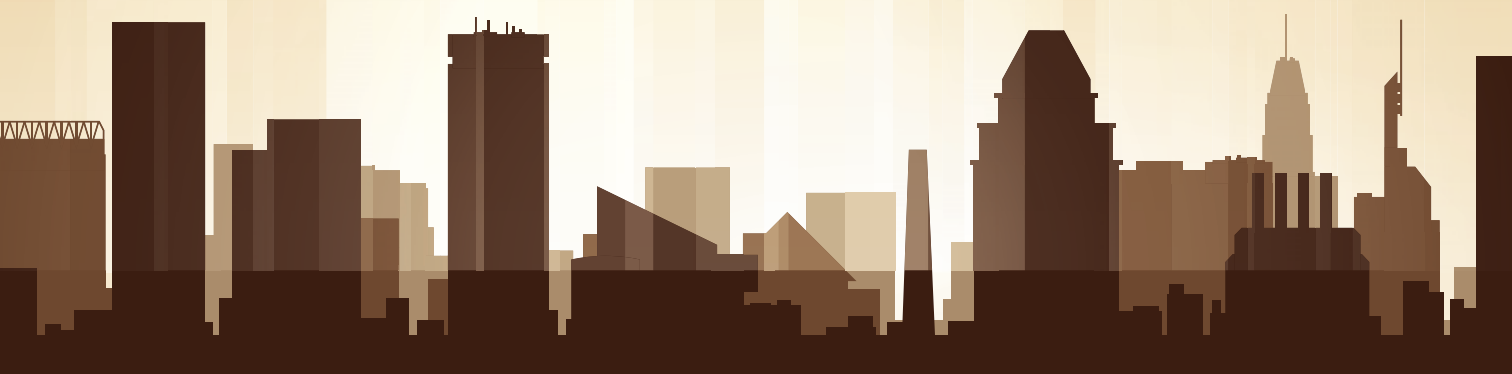
7 am to 5 pm	Registration/Check-in
8 am to 8:50 am	General Session: FMXcellence: Exceeding Expectations in Facilities
9 am to Noon	Educational Sessions
Noon to 4 pm	Expo Open
3:45 pm	Grand Prize Drawing
4 pm to 5 pm	Opening Night Networking Reception

WEDNESDAY, MARCH 5

7 am to 5 pm	Registration/Check-in
7:45 am to 8:50 am	Solutions Exchange
9 am to 11 am	Educational Sessions
11 am to 3 pm	Expo Open
2:45 pm	Grand Prize Drawing
3:10 pm to 5 pm	Educational Sessions
3:10 pm to 6 pm	Women in Facilities Management Panel and Reception

THURSDAY, MARCH 6

7 am to 3 pm	Registration/Check-in
8 am to 8:50 am	General Session: Complaints: How to Deal with the Negativity
9 am to 11 am	Educational Sessions
11 am to 2 pm	Expo Open
1:45 pm	Grand Prize Drawing
2:10 pm to 4 pm	Educational Sessions



www.nfmt.com/baltimore

Sessions At-A-Glance

(AS OF JANUARY 17, 2014)

MONDAY, MARCH 3

1:00 PM - 5:00 PM

PC1 Continuous Improvement Training*

PC2 Creating a Framework for Facility Reliability*

*Fee applies to pre-conference workshops.

NFMT Members: $99, Non-Members Pre-Registration: $149, On-site: $249

TUESDAY, MARCH 4

8:00 AM - 8:50 AM

TS.16 FMXcellence: Elevating the Role of Facilities Management

9:00 AM - 9:50 AM

T1.18 Three Simple Lessons to Achieve Excellence in Maintenance Planning and Scheduling

T1.21 How FM Organizations Learn from their Mistakes

T1.24 Energy Management in Existing Buildings

T1.27 Strategic Stewardship and the Preventative Maintenance Master Plan

T1.31 Greenhouse Gas Reduction Action Plan

T1.37 Historic Buildings Go Green: You Can Teach an Old Dog New Tricks

T1.39 Building Sustainability through Building Automation

T1.41 Introduction to EGSA, the Electrical Generating Systems Association

T1.43 The Owner's Role in Inspection, Testing and Maintenance of Water Based Fire Protection Systems

T1.45 Optimization of O&M through Data Driven Decisions

T1.47 Lifecycle Asset Management: A Proactive Approach

T1.49 COBie Case Study Part 1

10:00 AM - 10:50 AM

T2.18 Employment Law Issues Forum

T2.21 A Business Case to Improve OEE, ROA and ROI

T2.24 ASHRAE Standard 90.1 Energy Standard Overview and Applications

T2.27 Wireless Direct Digital Control

T2.30 Building Commissioning in the Complete Lifecycle of Facilities

T2.37 5S Case Study: Organization of a College Test Lab

T2.39 10 Ways to Get More Bang For Your Landscape Buck

T2.41 Power Systems - Foundation for Supporting your Critical Operations

T2.43 The Growing Need for Mass Notification

T2.45 Roof Repair or Roof Despair: It's More Than You Think

T2.47 Strategies for Repairing Failed Floor Finishes

T2.49 COBie Case Study Part 2

11:00 AM - 11:50 AM

T3.18 3rd Party Maintenance Outsourcing: Preparing for the Competition

T3.21 Transparency: The Future of Facility Management

T3.24 Real-Time Energy Management

T3.27 Why Benchmark for Failure?

T3.30 Recent Maryland K-12 Education Design Case Studies

T3.37 A Sustainable Certification Program for Facility Professionals

T3.39 Monetizing Large EPAct Tax Deductions

T3.43 NFPA 70E, NFPA 99 and OSHA Compliancy in Electrical Safety

T3.45 Everything You Wanted to Know About the ADA, but were Afraid to Ask

T3.47 The Revolution in LED Lighting: Technology Comes of Age

T3.49 GSA's Sustainable Facilities Tool

WEDNESDAY, MARCH 5

7:45 AM

Solutions Exchange Speed Learning/Networking Event

9:00 AM - 9:50 AM

W1.18 NASA's Post Occupancy Evaluation Program

W1.21 Energy Modeling Tools

W1.24 The Hidden Value of Commissioning

W1.27 Peak Value FM Services

W1.30 Healthcare Facility Management Compliance

W1.37 Green Cleaning: Implementing Changes to LEED-EBOM V4

W1.39 Operationally Sustainable Procurement

W1.43 FM Inspection and Testing of Fire Sprinklers

W1.45 Analytics Driven Asset Reliability & Maintenance Management

W1.47 Technology Trends in Retail FM

W1.49 Impact of Equipment Inventories on Organizations

10:00 AM - 10:50 AM

W2.18 Your Facility Management Career: Make the Most or be Under Employed

W2.24 Optimizing Energy Strategies with Load Response

W2.27 Building Re-Tuning: Low Cost Operational Improvements

W2.27 Simple Analytics using POA

W2.37 Green is Really About ROI

W2.39 Should LEED Be Adopted As Building Codes?

W2.41 Generator Docking Stations

W2.43 What to Expect from a Mitigation Vendor

W2.45 The National Park Service and the Facility Condition Index

W2.47 Protecting your Facility through the Whole Building Design Guide

W2.49 How to Specify Commercial Flooring

3:10 PM - 4:00 PM

W3.18 Facility Maintenance Modeling

W3.24 Advanced Retrofit Conservation Technologies

W3.27 Case Study of Adaptive Reuse: Mill No. 1 in Mt. Vernon

W3.30 Integrated Weather Barrier Concepts in Healthcare Architecture

W3.37 Recycling Program Evolution: Moving from the 3Rs to the 3Cs

W3.39 Sustainability in the Federal Government

W3.43 Significant Changes to the 2012 International Fire Code

W3.47 Self Funding Critical Facility Needs

W3.49 Smart Building Management: Proactive BMS Technology

3:10 PM - 5:00 PM

W3.45 Women in Facilities Management 2014 Edition

4:10 PM - 5:00 PM

W4.37 Before and After: NYC Schools' Response to Hurricane Sandy

W4.39 Water Conservation

W4.43 Fire Alarm/Suppression Systems: Common Problems and Practical Solutions

W4.49 The Emergence of Outcome-Based Services

THURSDAY, MARCH 6

8:00 AM - 8:50 AM

RS.16 Complaints: How to Deal with the Negativity

9:00 AM - 9:50 AM

R1.18 Calculating Your Maintenance Performance Index (MPI)

R1.21 The Foundation of Green Construction Codes: ASHRAE 189.1

R1.24 Advanced Electric Submetering

R1.27 Optimizing Chilled Water Plant Performance

R1.37 Social Media's Role in Sustainability

R1.39 Ensuring a Clean, Green & Healthy Indoor Environment

R1.43 The ADA: Red Flags that Trigger Complaints

R1.45 NEC 2014: Changes that Affect Your Facility

R1.47 Monitoring Based Commissioning using Visualization Techniques

9:00 AM - 10:50 AM

R1.49 Facilities Management Young Professionals Panel

10:00 AM - 10:50 AM

R2.18 Fundamentals for Legionella Water Safety

R2.24 Maximize Your Facilities Management, Maintenance, and Energy Performance

R2.27 LED Lighting: Less Secrets and More Surprises

R2.37 Be Water-Wise: Create and Maintain a Water-Efficient Landscape

R2.39 Full-Depth Reclamation (FDR)

R2.43 Implementing NFPA 70E for Arc Flash Safety

R2.45 CM Delivery Methods

2:10 PM - 3:00 PM

R3.24 Retro-Commissioning (RCx)

R3.43 The 17 Mistakes Made in Emergency Plans

R3.45 Maintenance Reliability in Natural Disasters and Emergencies

R3.47 Making All Your Dreams Come True (by Changing Your Metrics)

R3.49 Integrating Energy Data into Building Management Systems to Increase Efficiency and Cut Cost

3:10 PM - 4:00 PM

R4.37 The Next Generation of Energy Cost Reduction: From Efficiency to Productivity

R4.39 Internal Insulation and your HVAC System

R4.45 Stump the Expert

Extras

GENERAL SESSIONS

TUESDAY, MARCH 4 • 8:00-8:50 AM

Leadership and Career Advancement

FMXcellence: Elevating the Role of Facility Managers

Daniel C. Barr, Deputy Director, Division of Facilities and Equipment Management. Ohio Department of Transportation
William D. Broome, SFP, CFM, LEED Green Associate, Director of Facilities, The Westminster Schools
Bill Good, Chief Operations Officer, Des Moines Public Schools
Carl L. Morgan, AIA, Construction Manager II, Leon County Department of Facilities Management & Construction
Trent Frazier, Director, Field Operations Facilities Program Management Office, U.S. Customs and Border Protection
Jim Schrote, Executive Director of Facilities Services, George Washington University

Join *Building Operating Management* magazine for the fifth annual FMXcellence Recognition program as we acknowledges in-house FM teams that apply best practices and innovation to meet their organization's priorities. Hear directly from the honorees on the projects that played an important role in achieving results for the organization, whether it is a corporation, educational institution, government entity, or another type of commercial or institutional organization.

THURSDAY, MARCH 6 • 8:00-8:50 AM

Leadership and Career Advancement

Complaints: How to Deal with the Negativity

Presenters: Marc Fischer, CPM, RPA, CCIM, Senior Vice President & Director, Management Services, Transwestern
Susan Mazur-Stommen, Behavior and Human Dimensions Program Director. American Council for an Energy-Efficient Economy

The facilities department is the de facto complaints department in any organization. And most any FM has a story or two of some of the doozies they've been faced with, whether the complaint was outrageous, frivolous or just bizarre. Come listen to some of the situations fellow FMs were faced with, as reported in a recent *Building Operating Management* reader survey, and share your own stories. A panel of industry experts will offer insight on strategies for handling particular situations and how to walk the fine line between providing good customer service and chasing fires all day.

SOLUTIONS EXCHANGE

WEDNESDAY, MARCH 5 • 7:45-8:50 AM

Solutions Exchange is a round-robin interactive session that engages you through discussions on the critical topics in facilities management. Take your seat among your peers and join in an exchange of ideas, facilitated by some of the top manufacturers and experts serving the facilities industry. After 20 minutes, the roundtable disperses so that the next batch of table discussions can begin. You will have the opportunity to participate in up to three table discussions.

For a complete list of topics please go to: http://www.nfmt.com/baltimore/events/Solutions.asp#seTables

SPECIAL SESSIONS

WEDNESDAY, MARCH 5 • 3:10-5:00 PM

Women in Facilities Management 2014 Edition

THURSDAY, MARCH 6 • 9:00-10:50 AM

Facilities Management Young Professionals Panel

Sessions (AS OF JANUARY 17, 2014)

Monday, March 3

1:00 PM

PC1 Continuous Improvement Training

Bill Fellows, Green Cleaning Advisor, Bill Fellows Consulting

Learning Objective(s):
1. Assess why continuous improvement is vital
2. State obstacles to achieving continuous improvement
3. Recognize principles for overcoming obstacles to achieving continuous improvement
4. Identifying continuous improvement opportunities
5. Prioritizing continuous improvement opportunities

PC2 Creating a Framework for Facility Reliability

Andrew Gager, CMRP, CPIM, Principal Consultant, Nexus Global Business Solutions, Inc.

Learning Objective(s):
1. Establishing reliability as a strategic initiative
2. Making asset management a strategic element in the operation
3. Exploring facility wide philosophy of maintenance and reliability
4. Reliability as a shared responsibility across the organization

Tuesday, March 4

GENERAL SESSION

8:00 AM

TS.16 FMXcellence: Elevating the Role of Facilities

Learning Objective(s):
1. Understand the importance of the in-house FM team on the overall organization
2. Review best practices for in-house FM teams
3. Learn from best-case scenarios on how to implement new programs or initiatives
4. Comprehend why these programs stood out as some of the best of the year

9:00 AM

T1.18 Three Simple Lessons to Achieve Excellence in Maintenance Planning and Scheduling

Mike Gehloff, Discipline Leader, Work Execution Management, Allied Reliability Group

Learning Objective(s):
1. Engage internal and external maintenance team members into the maintenance planning and scheduling process
2. Place a focus on quantitative task descriptions in job plans to reduce rework and clarify expectations
3. Use visual management techniques to drive success in both weekly and shutdown management efforts
4. Measure your current maintenance planning and scheduling program maturity

T1.21 How FM Organizations Learn from their Mistakes

Stormy Friday, President, The Friday Group

Learning Objective(s):
1. Understand the definition of a learning FM organization
2. Identify common mistakes FM organizations make that allow them to learn
3. Classify leading an FM organization to learn by understanding learning DNA
4. Craft a game plan to transform failure into opportunity

T1.24 Energy Management in Existing Buildings

Davor Novosel, Chief Technology Officer, National Energy Management Institute (NEMI)

Learning Objective(s):
1. List the principal source and use of energy in existing buildings
2. Identify how big the energy savings opportunities are
3. Specify how to meet energy goals
4. Gain insight into energy management in context of human performance

T1.27 Strategic Stewardship and the Preventative Maintenance Master Plan

Bruce Meyer, EdD, Assistant Vice President for Campus Operations, Bowling Green State University
William Roess, LEED AP O+M, Vice President Corporate Development, Technical Assurance, Inc.

T1.31 Greenhouse Gas Reduction Action Plan

George Aburn, Department of the Environment, State of Maryland

Learning Objective(s):
1. Innovative ideas on reducing greenhouse gas
2. Identify how to absorb carbon dioxide from the atmosphere
3. Expand on state economy with initiatives
4. Utilize energy efficient buildings technologies

T1.37 Historic Buildings Go Green: You Can Teach an Old Dog New Tricks

Pete Arnoldt, Sales Consultant, RCx Building Diagnostics
Cindy Bittel, Business Development Manager, RCx Building Diagnostics

Learning Objective(s):
1. Specify the critical elements necessary to develop a successful sustainability plan
2. List the various tools utilized to work toward sustainability goals
3. Recognize how to overcome challenges specific to historic/older buildings
4. Discuss your most concerning assumptions regarding sustainability in existing facilities

T1.39 Building Sustainability through Building Automation

Ben Dorsey, Vice President, Marketing and Communications, KMC Controls

Learning Objective(s):
1. Name significant factors leading to building sustainability
2. Justify how building automation can help a facility professional achieve higher energy efficiency
3. State why an open standard BACnet system offers greater sustainability achievement than proprietary control systems

T1.41 Introduction to EGSA, the Electrical Generating Systems Association

Michael Pope, 2012 EGSA President, Marketing Manager & Senior Sales Engineer, Clariant Corp.

Learning Objective(s):
1. Have a basic understanding of the on-site power industry
2. Understand the structure, mission and services of EGSA
3. Understand how EGSA can help facility managers that operate emergency generator sets

T1.43 The Owners Role in Inspection, Testing and Maintenance of Water Based Fire Protection Systems

Jason Webb, Director of ITM, National Fire Sprinkler Association

Learning Objective(s):
1. Describe the role and responsibilities that building owners or their designated representatives have in the ITM process as outlined in NFPA 25
2. Recognize the difference between what is permitted for the building owner to do and what requires a fire sprinkler professional
3. Identify the proper documentation associated with inspection testing and maintenance

T1.45 Optimization of Operations and Maintenance through Data Driven Decisions

Angela Lewis, P.E., PhD, LEED AP, Project Manager, Facility Engineering Associates, PC

Learning Objective(s):
1. List what software is available to facility managers today
2. Gain awareness of questions to ask when determining what data is needed to populate

software
3. Learn about the construction operations building information exchange (COBie) standard and how it can be used to support data collection and software population
4. Evaluate how your facility management organization currently uses data to and how it can be used to support decision making

T1.47 Lifecycle Asset Management: A Proactive Approach

Marco Benitez, Director of Analysis, Assessment and Risk Management, Florida International University
Learning Objective(s):
1. Identify how an asset lifecycle management approach works, including the path to get there
2. List the benefits of implementing a facilities management solution
3. Classify the challenges and benefits of using internal staff to keep condition data up-to-date
4. Verify an asset lifecycle management approach helps justify funding requests and save money

T1.49 COBie Case Study Part 1

10:00 AM

T2.18 Employment Law Issues Forum

John E. Cruickshank, Attorney, Alaniz Schraeder Linker Farris Mayes, LLP
Learning Objective(s):
1. Recognize FMLA Issues
2. Identify sexual harassment in the workplace
3. Define the challenges of a greying workforce
4. Determine the best way to respond to government inquiries

T2.21 A Business Case and Process Re-Design to Improve OEE, ROA and ROI

Martin C. P. McElroy, CFM, Principal, MartinCompany Management Consultants, Inc.
Learning Objective(s):
1. Understand systems-age criteria for forecasting equipment maintenance upgrade and replacement
2. Verify application of WIMS/CMMS to maintenance planning, condition assessments and capital forecasts
3. State the maintenance team's role in reporting, tracking and advocating equipment/technology status
4. Label communication with ME/COO/CFO on maintenance/investment strategies

T2.24 ASHRAE Standard 90.1 Energy Standard Overview and Applications

Michael C. English, PE, CCP, LEED-AP, Senior Partner, Horizon Engineering Associates
Learning Objective(s):
1. Define ASHRAE Standard 90.1
2. Identify how new laws are applying ASHRAE Standard 90.1
3. Associate their facility with ASHRAE Standard 90.1 minimum requirements
4. Examine the criteria for determining compliance with ASHRAE Standard 90.

T2.27 Wireless Direct Digital Control

Jim Kohl, Senior Product Manager, Trane
Learning Objective(s):
1. List how wireless communication can help achieve on time, on budget project completion
2. Clarify how problem solving is easier or reduced with wireless
3. Find out how wireless can help achieve life cycle savings
4. Understand how ZigBee Building Automation supports the BACnet standard

T2.30 Building Comissioning in the Complete Lifecycle of Facilities

AIA Baltimore Chapter

T2.37 5S Case Study: Organization of a College Test Lab

Kate Kerrigan, Reliability Engineer, Allied Reliability
Learning Objective(s):
1. Define a 5S organization
2. Apply how to organize a project plan for change
3. Recognize how to effect change with part-time college student workforce
4. Observe the sustainability impact on 5S organizations

T2.39 Transform Your Property: 10 Ways to Get More Bang For Your Landscape Buck

Richard Restuccia, Director for Water Management Solutions, ValleyCrest Companies, Inc.
Learning Objective(s):
1. Discuss what to expect from your landscape partner from cost saving ideas to enhancements that build strong curb appeal
2. Identify specific areas to create a landscape that is functional, beautiful, sustainable and cost-effective
3. List water management secrets with the biggest ROI impact
4. Specific how to integrate your landscape with your overall property objectives

T2.41 Power Systems – Foundation for Supporting your Critical Operations

Gary Farmer, Power Systems Engineer, Curtis Engine & Equipment, Inc.
Learning Objective(s):
1. Gain knowledge of power system fundamentals
2. See examples of advanced power system applications
3. Learn how power system design can affect operational stability of facilities
4. Gain insight into the experience of others in a Q&A session

T2.43 The Growing Need for Mass Notification

David Smith, Director of Business & Channel Strategy, Lencore
Learning Objective(s):
1. Define what mass notification is, who it affects, who it protects and how it is being monitored
2. Outline the need for visual cues such as strobes, digital signage, email notifications, text messaging and message board displays
3. Explain the importance of audio notification
4. Review accepted industry standards measurements and practices established by NFPA 72

T2.45 Roof Repair or Roof Despair: It's More Than You Think

Nick O'Hare, Client Relations Specialist. StructureTec
Learning Objective(s):
1. Differentiating between good and bad roof repairs
2. Isolating roof deficiencies based on condition
3. Means and methods to properly evaluate your roof systems
4. Making sure you have the right contractors on your roof

T2.47 Strategies for Repairing Failed Floor Finishes

Philip Frederick, Staff Engineer, Simpson Gumpertz & Heger Inc.
David Slick, Associate Principal, Simpson Gumpertz & Heger, Inc.
Learning Objective(s):
1. Identify industry changes and current practices that result in elevated concrete moisture levels
2. Recognize critical floor failure mechanisms
3. Design and construct floor finish repairs that consider substrate quality and preparation, environmental conditions, code requirements and safety concerns
4. Select a floor finish repair strategy that addresses existing conditions

T2.49 COBie Case Study Part 2

11:00 AM

T3.18 3rd Party Maintenance Outsourcing: Preparing for the Competition

Jamshed Rivetna, President, Ensoft Consulting, Inc.
Learning Objective(s):
1. Learn and understand the outsourcing model and why 3rd party service providers are appealing to an organization
2. Clarify specific ways your organization can keep pace with 3rd party service providers
3. List examples of management reports for assessing and monitoring department operating performance
4. State steps to take for identifying and implementing operating improvement

T3.21 Transparency: The Future of Facility Management

Dean Kashiwagi, PhD, P.E., Professor and Director of the Performance Based Studies Research Group, Arizona State University
Learning Objective(s):
1. Identify how transparency is created by the proper metrics
2. Review how transparency requires minimization of "management, direction and control"
3. Discuss how to utilize expertise and increasing value rather than cutting costs

T3.24 Real-Time Energy Management

David Borchardt, P.E., LEED AP BD+C, Chief Sustainability Officer, The Tower Companies
Learning Objective(s):
1. Learn how to implement building energy monitoring at a commercial office
2. Understand the costs, potential payback, and time required for implementation of a real-time energy program
3. Apply the lessons learned by others to achieve high performance in your facilities
4. Learn how to engage your building staff to think about constant improvement of energy performance

T3.27 Why Benchmark for Failure?

Stormy Friday, President, The Friday Group
Doug Kincaid, PE, President and General Manager, Applied Management Engineering
Learning Objective(s):
1. Reveiw what to look for in published benchmarking data that could skew results for comparisons
2. Understand how to address benchmarking results that are pushed down and do not reflect the FM environment
3. Learn how to develop benchmarking so it reflects true needs
4. Review how to use real internal benchmarks

T3.30 Recent Maryland K-12 Education Design Case Study

AIA Baltimore Chapter

T3.37 A Sustainable Certification Program for Facility Professionals

Justin Koscher, Vice President of Public Policy, Center for Environmental Innovation in Roofing
Learning Objective(s):
1. Discover how the RoofPoint Registered Professional (RRP) program helps build expertise and professionalism in sustainable roofing
2. Explore the RRP Program Manual and learn how experienced roofing professionals can qualify for certification
3. Learn how the RRP program can be used to assist building owners in making sustainable roofing decisions and validating their sustainable roofing choices
4. Learn how make an application to the RRP program and prepare for the RRP qualifying examination

T3.39 Monetizing Large EPAct Tax Deductions

Jacob Goldman, Chief Engineer, Energy Tax Savers, Inc.
Learning Objective(s):
1. State the new changes to EPAct 179D
2. Identify the details in the new 179F provision
3. State strategies to maximize return on investment related to energy efficiency projects
4. Recognize past projects can still garner tax savings

T3.43 The Latest in NFPA 70E, NFPA 99 and OSHA Compliancy in Electrical Safety

Doug Tellin, Owner/Master Electrician, Electrical Safety Specialists
Learning Objective(s):
1. Define the latest NFPA 70E and OSHA requirements as it pertains to electrical safety and electrical distribution for facilities
2. Discuss what the best approach is for safety proactive or reactive
3. Determine if electrical maintenance is an important part of electrical safety

T3.45 Everything You Wanted to Know About the ADA, but were Afraid to Ask

M. Bradley Gaskins, AIA, CASp, COO, Partner, The McIntosh Group
Learning Objective(s):
1. Discover the most common misunderstood elements of the ADA
2. Learn positive reasons to be compliant
3. Learn the appropriate accessibility standards you should follow
4. Learn answers to your ADA questions

T3.47 The Revolution in LED Lighting: Technology Comes of Age

Bruce Craig, Consultant, Axlen Lighting
Learning Objective(s):
1. Briefly review how LED technology has changed over the last few decades and focus on recent technological advances that affect the marketplace today
2. Understand the key issues when considering LED solutions for lighting upgrades and new construction projects

T3.49 GSA's Sustainable Facilities Tool

Wednesday, March 5

7:45 AM

Solutions Exchange Speed Learning/Networking Event

9:00 AM

W1.18 NASA's Post Occupancy Evaluation Program

Pete Aitcheson, O & M Program Manager. NASA Headquarters
Learning Objective(s):
1. Examine the value of having a comprehensive post occupancy evaluation program
2. Identify the components of a good POE program
3. Observe lessons learned from the program

W1.21 Energy Modeling Tools – Solutions for Creating a High Performance Building

Neil Maldeis,Energy Engineering Manager, Trane Commercial Systems
Learning Objective(s):
1. Learn how to use and apply modeling tools methods and practices
2. Learn from success stories of how modeling was used to achieve high performance building results
3. Gain insights on what's required to set up an energy modeling system and learn how to perform a high-level cursory review of possible energy savings
4. Understand the factors that affect possible savings regarding the efficiency and health of existing building systems

W1.24 The Hidden Value of Commissioning

Mohamad Jamal, P.E., President and Chief Mechanical Engineer, A.J. Adam Engeineering, LLC
Marc Wylie Sullivan,Associate, A.J. Adam Engeineering, LLC
Learning Objective(s):
1. Identify the costs of commissioning a specific project
2. Evaluate the potential benefits associated with a decision to commission a project
3. Identify the hidden potential value outcomes from commissioning a specific project in order to form a basis for clear commissioning contract requirements
4. State potential construction cost savings benefits to increase project profitability

W1.27 Peak Value FM Services

Alan R. Fyffe, U.S. Regional Facilities Manager, Delphi Automotive
Martin C. P. McElroy, CFM, Principal, MartinCompany Management Consultants, Inc.
Learning Objective(s):
1. Outline high-performance standards for "Service-Level Agreements" and "Promises Made"
2. Establish performance criteria for FM service providers – "Promises Kept"
3. Provide owners with guidelines for evaluating FM service providers competencies and capacities
4. Define strategies for a collaborative management framework for Peak Value FM Services

W1.30 Healthcare Facility Management Compliance

David Stepelevich, CHFM, Vice President, Healthcare Building Solutions
Joseph J Watson, PE, CxA, LEED AP, Senior Project Engineer, E3 Designs

Learning Objective(s):
1. Learn about ASHE Healthcare Commissioning Guidlines
2. Review about how the guidelines are outlined
3. Understand the important areas of the building according to ASHE

W1.37 Green Cleaning: Getting Vendors To Implement Changes To LEED-EBOM V4

Stephen P. Ashkin, President, The Ashkin Group, LLC
Learning Objective(s):
1. Learn the changes in LEED-EBOM V4 and how they specifically affect cleaning requirements
2. Learn specific easy to use recommendations to have cleaning service providers implement the changes
3. Learn cost effective strategies to separate out specific cleaning suppliers to meet LEED requirements and reduce overall costs
4. Learn how to communicate the improvements to occupants, tenants, and other important stakeholders

W1.39 Operationally Sustainable Procurement

Vince Elliott, President, Elliott Affiliates, Ltd.
Learning Objective(s):
1. List the seven deadly sins of buying services
2. State the number one reason for knowing that you selected the right contractor
3. Apply how to manage the bidding project in a lot less time
4. Observe how to know that you have the right price

W1.43 FM Inspection and Testing of Fire Sprinklers

Dan Meneguin, Chief Operations Officer, Sinsinawa Dominicans Inc.
Learning Objective(s):
1. Review an overview of fire sprinkler systems
2. Identify the inspection requirements and procedures
3. List the testing requirements
4. Explain the owner responsibilities

W1.45 Analytics Driven Asset Reliability & Maintenance Management

Sunil Kamerkar, Principal Consultant, Asset Analytix
Learning Objective(s):
1. Review, assess, and improve asset related data quality
2. Tips for streamlining reliability & maintenance analysis requirements
3. Review best practices KPIs to be included in the dashboards and reports

W1.47 Technology Trends in Retail FM

Tim Backstrom, Director, Facilities Management, Staples, Inc.
Joshua Witte, RFMP, Director, Industry Programs, PRSM
Learning Objective(s):
1. Learn about the trends in technology impacting retail FM
2. Streamline vendor management processes thru integration with new technologies
3. Learn about efficiencies to be gained thru deployment of new technology in your FM departments

W1.49 Impact of Equipment Inventories on Building Owners and Organizations

Robert Keady, Facility Manager
Learning Objective(s):
1. Define and learn the different equipment inventory types
2. Define the business case for accurate equipment inventories
3. Define the importance of equipment inventories to business
4. Determine the best type of equipment inventory for any business.

10:00 AM

W2.18 Your Facility Management Career: Make the Most of It, or Join the Ranks of the Under Employed

Michael B. Cowley, CPMM, President, CE Maintenance Solutions
Learning Objective(s):
1. Understand the direction the profession is headed
2. Review how technology will assist moving forward
3. Discuss how the depth and quality of your organization can assist as you move into the future
4. Create an understanding of the financial tools and processes which will assist in justifying future changes

W2.21 Building Re-Tuning: Low-Cost Operational Improvements

John Manz, Director, National Sustainable Structures Center, Pennsylvania College of Technology
Learning Objective(s):
1. Learn the four step prescriptive approach of building re-tuning to identify and correct building operational problems that lead to energy waste
2. Discuss the importance of conducting regular building walk-downs and what to look for during these investigations
3. Examine a case study example to determine recommendations and solutions
4. Identify how to use meter data profile analysis to calculate energy savings

W2.24 Optimizing Energy Strategies with Load Response and Energy Efficiency

Greg Fox, Director, Business Development, Constellation
Learning Objective(s):
1. Analyze energy needs while considering business driver, operational issues and data
2. Review all energy interactions as one integrated energy management system
3. Understanding your energy management system, including rate response, peak response, price response, and efficiency made easy
4. Processing and analyzing your company's energy data

W2.27 Simple Analytics using POA

Steve Tom, P.E., PhD, Director of Technical Information, Automated Logic Corp.
Learning Objective(s):
1. Understand how equipment failures and maintenance problems can dramatically affect energy use
2. Know how analytics packages utilize fault detection and diagnostics routines to spot operating problems
3. Understand how rules-based logic can be used to identify common problems such as stuck dampers, leaking valves, or rogue schedules

W2.37 Green is Really About ROI

F. Joshua Millman, AIA, Principal, Facilities Planners & Architects, Inc.
Learning Objective(s):
1. Employ the mechanics of ROI measurement of facilities capital projects
2. Understand a systematic process for identifying facilities sustainability projects
3. Employ ROI to evaluate facilities sustainability projects based on total cost of ownership and measureable direct and indirect returns
4. Present ROI analysis of facilities sustainability projects to upper management to obtain the capital funding

W2.39 Should LEED Be Adopted As Building Codes?

Mark Lentz, P.E., President, Lentz Engineering Associates, Inc.
Lawrence G. Spielvogel, P.E., Consulting Engineers
Learning Objective(s):
1. List common failures to achieve LEED
2. Clarify LEED facts and fiction
3. Discuss building code reality
4. Explain fuzzy green features

W2.41 Generator Docking Stations: How to Back up Your Facility when Your Backup Plan Fails

Chris Dahl, President, Trystar
Jon Sunde, Certified Master Electrician, Trystar
Learning Objective(s):
1. Steps to protect you when your back up generator fails or needs to be taken down for service
2. Different connection methods for different applications, critical power, non-critical power, long-duration power outages
3. Understanding how to be prepared to get your facility back up and running quickly

W2.43 What to Expect from a Mitigation Vendor

John Sooker,National Accounts Division Manager, Servpro Industries, Inc.
Learning Objective(s):
1. Learn how to identify, select and manage a fire and water mitigation company
2. Review select criteria and industry standards

W2.45 The National Park Service and the Facility Condition Index: A Case Study

Doug Kincaid, PE, President and General Manager, Applied Management Engineering
Learning Objective(s):
1. Identify strategic decision-making processes
2. Review asset management practices
3. Define facility performance targets
4. List culture change to managing facilities

W2.47 Protecting your Facility and the People and Assets Within, Through the Whole Building Design Guide

Richard Paradis, P.E., BSCP, Director, Advanced Materials Program, National Institute of Building Sciences
Learning Objective(s):
1. Understand the integrated design process as it pertains to facility security and safety
2. Learn about the proactive approach to designing buildings for security and safety
3. Identify the fundamental principles of all-hazard building design
4. Discover security and safety resources and training that aid the facility manager and O&M staff

W2.49 How to Specify Commercial Flooring

Lewis G. Migliore, President, LGMTCS and Associates
Learning Objective(s):
1. Review how to get the correct product and installation in the space
2. Understand what you need to know first for the spec
3. Clarify who should you listen to the manufacturer or the flooring contractor

3:10 PM

W3.45 Women in Facilities Management 2014 Edition

Naomi Millan, Associate Editor, ,Building Operating Management
Learning Objective(s):
1. Compare if there are difference between being a woman or man in facilities management
2. Identify different career paths within facilities management
3. Review the importance of networking and mentoring others
4. Understand how to attract and retain other females in facilities management

W3.18 Facility Maintenance Modeling

Van Dobson, Associate VP, Facilities Services and Campus Planning, Lehigh University
Frank Kaleba, Senior Engineer, R&K Solutions
Learning Objective(s):
1. Explain the need for maintenance modeling
2. Describe the steps in the modeling process
3. Describe a case study/ example
4. Summarize the benefits and use of modeling

W3.24 Advanced Retrofit Conservation Technologies

Scott Milne, President, CEO, National Energy Technologies
Learning Objective(s):
1. Understand advanced efficiency technologies, one building system at a time
2. Discover how to utilize elements found in nature to reduce utilities, protect health, and preserve equipment
3. Adopt new and affordable conservation solutions for efficient operations
4. Learn how certain conservation strategies protect health and reduce consumer liability

W3.27 Case Study of Adaptive Reuse: Mill No. 1 in Mt. Vernon

Joe Palazzi, Superintendent, Kinsley Construction - Contractor
Bruce Rogers,Business Development, Kinsley Construction
David Tufaro, Developer, Founder, Terra Nova Ventures
Learning Objective(s):
1. Understand how the renovation of a century old building within a 100 year flood plain took place
2. Discuss the adaptive reuse of existing structure without adding new structural materials
3. Review the historic tax credit application
4. Specify the historic preservation guidelines and applicability

W3.30 Integrated Weather Barrier Concepts in Healthcare Architecture

Bill Conley, RWC, President/Principal-in-charge, Conley Group
Learning Objective(s):
1. Define and develop a better understanding of the concept of sustainability
2. Explore the need for integrated weather barrier during the planning phase of a project
3. Explore the processes of material selection and specification

W3.37 Recycling Program Evolution: Transitioning from the 3Rs to the 3Cs

Bruce Buchan, Founder and CEO, CleanRiver Recycling Solutions
Learning Objective(s):
1. Define what elements are critical to the success of a recycling program
2. Discuss why the ability to right-size the capacity of their recycling container is critical to protecting their initial capital investment
3. State the importance and relevancy of being future-ready in their recycling program and how it relates to their anticipated ROI
4. List the different types of recycling program killers and they will be equipped with strategies to avoid or address them

W3.39 Sustainability in the Federal Government

Lawrence A. Melton, CEO and President, The Building People

W3.43 Significant Changes to the 2012 International Fire Code

Andrew M. Schneider, PE, Senior Fire Protection Engineer, Koffel Associates, Inc.
Learning Objective(s):
1. Identify significant changes to the 2012 edition of the IFC
2. Understand the concepts behind the changes
3. Recognize the impacts of the changes to new and existing features
4. Apply the updated requirements in their facilities

W3.47 Self Funding Critical Facility Needs

William Maurer, Senior Vice President, ABM
Learning Objective(s):
1. How to utilize your existing operating budget to fund critical facility upgrades
2. How to implement energy saving measures that will save over 25 perecent in annual utility costs
3. How to better manage and predict your operating budget
4. How to fund the necessary energy improvements

W3.47 Smart Building Management: Reducing Overhead and Headaches with Proactive BMS Technology

Michael Zimmerman, CEO, BuildingIQ
Learning Objective(s):
1. Review and discuss core issues in balancing building performance, tenant satisfaction, and managing costs
2. Highlight new technologies and approaches that positively overcome challenges without capital expenditure or operating budget increases
3. Introduce the concept of predictive energy optimization
4. Provide case studies on real savings and operational improvements

4:10 PM

W4.37 Before and After: NYC School's response to Hurricane Sandy

John T. Shea, CEO, Division of School Facilities, The New York City Department of Education
Learning Objective(s):
1. Recognize how large municipal facilities organizations manage complex natural disaster recovery operations
2. Discuss how teamwork and preparation are vital for successful outcomes, using New York City as the model
3. List what tools, processes, and procedures are needed for leaders to make good decisions during times of crises, from lessons learned during this unprecedented event

W4.39 Water Conservation

Ken Sensel, Senior Product Manager, BETCO

W4.43 Fire Alarm/Suppression Systems: Common Problems and Practical Solutions

Steve Carter, Vice President of Engineering, ORR Protection Systems
Learning Objective(s):
1. Reduce emergency fire alarm calls saving time and money
2. Have a better understanding of NFPA Standard requirements for all fire alarm systems
3. Learn how to train your staff to address simple and avoidable problems.
4. Learn the what, were and how long for NFPA required record keeping.

W4.49 The Emergence of Outcome-Based Services

Lou Ronsivalli,Global Services Offer Development Leader, Trane/Ingersoll Rand
Learning Objective(s):
1. Why operational outcomes are replacing calendar-based service tasks in today's service models
2. Capture data to create more effective service models
3. How to economically justify service

Thursday, March 6

GENERAL SESSION

8:00 AM

RG.16 Complaints: How to Deal with the Negativity

Marc Fischer, CPM, RPA, CCIM, Senior Vice President & Director, Management Services Transwestern
Susan Mazur-Stommen, Behavior and Human Dimensions Program Director American Council for an Energy-Efficient Economy
Learning Objective(s)
1. Review some of the situations fellow FMs were faced with regarding complaints
2. Review strategies for handling particular situations
3. Understand how to walk the fine line between providing good customer service and chasing fires all day

9:00 AM

R1.18 What's Your Grade – Calculating Your Maintenance Performance Index (MPI)

C. Paul Oberg, President and Chief Executive Officer, EPAC Software Technologies, Inc.
Learning Objective(s):
1. Describe the maintenance performance index (MPI)
2. Analyze the relationship between key performance indicators (KPI) and MPI
3. List your MPI components
4. Learn to calculate your MPI

R1.21 The Foundation of Green Construction Codes: ASHRAE 189.1

Jim Sinopoli, Managing Principal. Smart Buildings, LLC
Learning Objective(s):
1. Develop a basic knowledge of the mandatory criteria of ASHRAE 189.1
2. Demonstrate and communicate the sustainable value of green building construction codes
3. Identify and describe the purpose, intent and foundations of ASHRAE 189.1

R1.24 Advanced Electric Submetering for Retrofit and New Construction

Lee Shaver, Specification Engineer, Quadlogic
Learning Objective(s):
1. Review how property managers give tenants visibility to their energy usage
2. Understand how energy monitoring and submetering help save money
3. State the submetering and energy monitoring technologies that exist
4. List some examples of properties successfully employing submetering and energy monitoring technology

R1.27 Optimizing Chilled Water Plant Performance

David Herman, PE, LEED AP, Principal, EnerG Associates, LLC
Learning Objective(s):
1. Review the design and operating characteristics of each equipment component of a chilled water plant
2. Understand how the design characteristics and operation of each equipment component effects overall chiller plant efficiency
3. Learn how to evaluate strategies to optimize chilled water plant performance based on existing chilled water plant design and operation

R1.37 Social Media's Role in Sustainability

Peter Doo, FAIA, LEED AP, Partner, Doo Consulting
Lorraine Doo, MPA, LEED AP, Partner, Doo Consulting
Learning Objective(s):
1. Identifying current social media tools used for communicating to different populations
2. Determine which metrics to use when evaluating the effectiveness of social media campaigns
3. How to educate leadership about the value of social media
4. Being able to build a social media campaign to create behavior change

R1.39 Ensuring a Clean, Green & Healthy Indoor Environment

Dan Wagner, Director of Facility Service Programs, ISSA
Learning Objective(s):
1. Understand the crucial connection between cleaning and sustainability
2. Recognize the necessary management and operational characteristics of a quality customer-focused cleaning organization
3. Identify the key elements of a comprehensive green cleaning program
4. Appreciate the role cleaning plays in protecting against potential public health threats

R1.43 The ADA: Red Flags that Trigger Complaints

Mark J. Mazz, Architect, Mark J. Mazz, AIA
Learning Objective(s):
1. Understand that when a space changes use, accessible concerns may appear
2. Where construction documents could be improved
3. Learn a few Red Flags that trigger complaints
4. How to reduce the risk of noncompliance

R1.45 NEC 2014: Changes that Affect Your Facility

Robert Clukey, Instructor/Master Electrician, American Trainco
Learning Objective(s):
1. Understand the new changes to the 2014 National Electric Code
2. How do these changes affect your facility
3. How to keep your workers safe around electricity

R1.47 Monitoring Based Commissioning using Visualization Techniques

Ben Burgoyne, Mechanical Engineer, Ebert & Baumann Consulting Engineers, Inc.
Learning Objective(s):
1. Describe how operating costs can be reduced and occupants comfort can be increased by applying monitoring based Cx
2. Understand the innovative technique to visualize large amount of monitoring data (e.g. BAS data) using it for monitoring based Cx
3. Identify and reduce the gap between the actual and expected building performance through monitoring based Cx

R1.49 Facilities Management Young Professionals Panel

Damon Gonzales, CFM, VP for Facilities Management, Davenport University
Kevin Blanchard, Assistant Facility Manager/ COTR, National Air & Space Museum, Steven F. Udvar-Hazy Center, Smithsonian Institution
Learning Objective(s):
1. Reivew how the ageing workforce is leading to an unprecedented number of opportunities for young professionals
2. Undertand that an FM must be a person who thinks strategically about the goals and long-term plans of not only the FM department, but also the organization as a whole.
3. List the skill set necessary for a sucessful FM career.

10:00 AM

R2.18 Fundamentals for Legionella Water Safety

Frank Sidari, Vice President on Consulting, Special Pathogens Laboratory
Learning Objective(s):
1. Know who is at risk for Legionnaires' disease in

your facility
2. Identify key players who are responsible for water safety
3. Know what part of a water system could lead to Legionella exposure
4. Learn the fundamentals of Legionella water safety.

R2.24 Maximize Your Facilities Management, Maintenance, and Energy Performance

Bill Groth, Senior EAM Solutions Consultant, INFOR
Learning Objective(s):
1. Specify the best practices in asset management
2. Review sustainability performance reporting, capital planning, and cost monitoring
3. Examples of creative uses of management dashboard, mobile solutions, and cloud-based asset management software deployment will be discussed
4. List evolving trends related to energy management

R2.27 LED Lighting: Less Secrets and More Surprises

John Curran, President, LED Transformations, LLC
Learning Objective(s):
1. How LEDs are enabling new lighting control architectures/methods
2. Understanding how sensor selection and placement will become an important element of future lighting systems
3. Examples of some typical installation problems and how to avoid them when using LED-based luminaires
4. Earn knowledge of some unresolved testing standard issues that specifiers and facilities managers should be aware of

R2.37 Be Water-Wise: Create and Maintain a Water-Efficient Landscape

Scott C. Scarfone, ASLA, Principal and Founder, Oasis Design Group
Learning Objective(s):
1. Learn about water efficient landscape design and management
2. Gain insight on site analysis, design, and management considerations necessary to create a water-wise landscape
3. Understand basic horticultural principles that can aid in irrigation reduction
4. Understand overall landscape design strategies that can minimize the need for water application

R2.39 Full-Depth Reclamation (FDR)

Tim McConnell, Pavements Engineer, Portland Cement Association
Learning Objective(s):
1. Gain an in-depth understanding of the Full Depth Reclamation (FDR) Process and how it can improve your pavement structure
2. Learn how your existing previously capitalized materials can be recycled and improved on site
3. Learn how the FDR process can save both time and money while being less disruptive to your ongoing operations

R2.43 Implementing NFPA 70E for Arc Flash Safety

Daryn Lewellyn, President/Founder, Lewellyn Technology
Learning Objective(s):
1. Learn how OSHA and NFPA 70E work together
2. Learn what changes when implementing NFPA 70E
3. Learn the steps to completing an Arc Flash Hazard Analysis
4. Learn why the NFPA 70E tables can't direct PPE usage

R2.45 CM Delivery Methods

Keith Vandenbussche, FMA, Director, Facilities Services, Barton Malow Company
Learning Objective(s):
1. Understand construction management delivery methods
2. State tools used to select construction management
3. Discuss CM industry trends

2:10 PM

R3.24 Retro-Commissioning (RCx)

Dan Brown, Senior Associate, The Stone House Group
Darren Cassel, Principal, The Stone House Group
Learning Objective(s):
1. Learn the difference between process versus technical commissioning
2. Learn how retro-commissioning is able to enhance overall building performance and why it is your most cost-effective strategy
3. Learn identified systems and/or buildings that require retro-commissioning
4. Learn how the process is as much a business strategy as it is energy

R3.43 The 17 Mistakes Made in Emergency Plans And How to Avoid & Correct Them

Bo Mitchell, President and CEO, 911 Consulting
Learning Objective(s):
1. Review the laws, regulations and standards that control emergency plans
2. Recognize how a lawsuit affect you and your organization
3. Verify what should the overriding attitude for managers in re-evaluating current planning
4. Name how your own employees and clients hurt your response to a disaster.

R3.45 Maintenance Reliability in Natural Disasters and Emergencies

Richard Sovic, Vice President of Engineering and Project Management, ThermaSIP, Inc.
Learning Objective(s):
1. Learn the benefits of a proactive approach for maintaining reliability in natural disasters and during critical equipment failures
2. Learn the five steps to maximize facility availability and business continuity for potential existing facility emergencies
3. Advanced techniques for design for world class performance for facility availability and business continuity during emergencies

R3.47 Making All Your Dreams Come True (by Changing Your Metrics)

Robin Camarote, Founder and CEO, Craft and Atlas LLC
Learning Objective(s):
1. Expand facility performance measures beyond condition change and average O&M spend
2. Combine existing data with new sources
3. Interpret changes and integrating findings into your asset management program
4. Strategically communicate outcomes, how to best tell your story

R3.49 Integrating Energy Data into Building Management Systems to Increase Efficiency and Cut Cost

Jack Group, Eastern Regional Manager, E-Mon, LLC
Learning Objective(s):
1. Review basic submetering terminology, equipment, installation, operation, applications and capabilities
2. Demonstrate how submeter-based energy data acquisition save energy and cut cost
3. Understand how submeters can be integrated with HVAC, lighting, utility meters and more

3:10 PM

R4.37 The Next Generation of Energy Cost Reduction: From Efficiency to Productivity

John Zabilowicz, COO, ZF Energy Department
Learning Objective(s):
1. A basic understanding how electricity and gas markets work
2. How to buy wholesale energy without wholesale risk
3. How to create five sigma+ electrical reliability
4. How to manage onsite generation technology

R4.39 Internal Insulation and your HVAC System

James Choquette, Vice President, Duct and Vent Cleaning of America
Learning Objective(s):
1. Identify potential iIssues with internal insulation
2. Understand the difference between open and closed cell insulation
3. Understand the options that a facilities decision maker has pertaining to interior insulation
4. Understand the reasons that internal insulation is specified into a HVAC System

R4.45 Stump the Expert

Paul Head, II, Manager, Ernst & Young Construction Real Estate Advisory Services
Michael B. Cowley, CPMM, President, CE Maintenance Solutions
Join NFMT experts as they answer your questions. This fun, interactive session will allow you to ask question you don't know who could answer. Come prepared to try and "stump the expert."

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REMEMBER: These are a just some of the benefits of NFMT Membership. To learn about every single benefit, and to sign up, visit www.nfmt.com/baltimore/membership.

www.NFMT.com

BUILDING OPERATING MANAGEMENT'S
NFMT
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NFMT Booth #2395

BUILDING OPERATING MANAGEMENT'S NFMT2014

National Facilities Management & Technology March 4-6, 2014 • Baltimore

Three Easy Ways to Register:

ONLINE www.nfmt.com/baltimore
FAX This form to arrive by February 24 (708) 344-4444
MAIL This form to arrive by February 24
CompuSystems Inc.
P.O. Box 6271
Broadview, IL 60155-6271

After February 24, 2014 register online or bring this form to register on-site and save $50.

Registrant Information

(Please print or type. This form can be photocopied for additional registrations).

Attendee Information

Priority Code from Mailing Panel ____ _____

☐ Mr. ☐ Ms. ☐ Mrs.
First Name _____ MI _____
Last Name _____
Title _____
Company _____
Address 1 _____
Address 2 _____
City _____ State/Province _____
Postal/Zip Code _____ Country _____
E-mail _____
Needed to send your confirmation
Phone _____ Ext _____
Cell _____
Provide your cell number to receive show updates and alerts via text. Standard text messaging rates apply.

☐ Please send me information about Exhibiting at NFMT2014

Industry Designation

☐ PE	☐ FMP	☐ RPA	☐ SMA
☐ LEED-AP	☐ CPMM	☐ AIA	☐ BEMP
☐ HFDP	☐ OPMP	☐ CFM	☐ SFP
☐ FMA	☐ LEED-GA	☐ CPE	☐ CPS
☐ BEAP	☐ CPMP	☐ HBDP	

☐ Other _____

Registration Options include FREE Educational Sessions

Complete session schedule is available online at nfmt.com/baltimore. Build your itinerary during your online registration or select sessions when you arrive at NFMT! Your registration includes access to all sessions during the event, excluding pre-conference workshops.

	Pre Registration	Onsite on 3/4/14
☐ Expo and Conferences	$0	$50
☐ Expo Only	$0	$50

PreConference Workshops

$99 for NFMT Members ‖ *$149 for Non-NFMT members* ‖ *On-site price $249 each*

Monday, March 3 ***1:00pm - 5:00pm***
☐ PC1 Continuous Improvement Training
☐ PC2 Creating a Framework for Facility Reliability

NFMT Membership Program

☐ NFMT Membership $99 for one year membership
Detailed member benefits available www.nfmt.com/online
☐ I'm already an NFMT Member. My member number is _____
☐ No thank you, I do not wish to upgrade my Free registration

On-site benefits include:
- Membership card
- Member Polo shirt
- Discounts for pre-conference workshops
- Member only premium conference sessions
- Member Only registration counter
- Member Only lounge on the exhibit floor
- $5 off lunch coupon per day of live event

On-line benefits:
- Quarterly newsletter
- Member Only webinars
- Premium Member Only Content on NFMT 360

TOTAL from Above $_____

Attendee Demographic

What age group do you belong to?
☐ Under 35 years old ☐ 45 to 54 years old ☐ 65 years or older
☐ 35 to 44 years old ☐ 55 to 64 years old ☐ Prefer not to answer

Type of organization/facility (Check one)
☐ Architectual/Consultants/Contractors ☐ Government ☐ Retail
☐ Commercial ☐ Hospitality ☐ Utility
☐ Educational ☐ Industrial ☐ Other_____
☐ Energy/Allied Firms ☐ Medical _____

Job Function (Check one)
☐ Construction Management ☐ Maintenance Management
☐ Energy Management ☐ Operations Management
☐ Engineering Management ☐ Property/Asset Management
☐ Executive Management ☐ Security Management
☐ Facility Management ☐ Sustainability Management
☐ Grounds Management ☐ Other_____

Total Number of Buildings: (Check one)
☐ 1000 or more ☐ 100-499 ☐ 20-49 ☐ 8-13 ☐ 1-3
☐ 500-999 ☐ 50-99 ☐ 14-19 ☐ 4-7 ☐ N/A

Total Square Footage: (Check one)
☐ Over 10 million ☐ 1-3 million ☐ 100,000-249,999
☐ 6-10 million ☐ 500,000-999,999 ☐ Less than 100,000
☐ 3-6 million ☐ 250,000-499,999 ☐ N/A

How much do you anticipate spending on facility operations, renovation and new construction in the next 12 months?
☐ $10 million or more ☐ $500,000 to $999,999
☐ $5 million to 9,999,999 ☐ Less than $500,000
☐ $1 million to $4,999,999 ☐ N/A

Buy/Specify/Recommend: (Check all that apply)
☐ Access Control/Security ☐ Lighting/Controls
☐ Boilers/Water Heaters ☐ Maintenance Products
☐ Building Automation ☐ Material Handling
☐ Building Services ☐ Motors/Drives
☐ Carpeting ☐ Paints/Coatings
☐ Ceilings ☐ Power (Power, rental, generation, quality)
☐ Diagnostic/Monitoring Instruments ☐ Power Tools
☐ Door Hardware ☐ Restroom/Plumbing
☐ Elevators ☐ Roofing
☐ Energy Management ☐ Software
☐ Fire Safety ☐ Sustainable Products
☐ Floor Care Equipment ☐ Telecommunications
☐ Flooring ☐ Water Conservation Products
☐ Grounds Care Equipment ☐ Windows/Doors/Entry Systems
☐ HVAC Equipment ☐ Other: _____
☐ IAQ Products

Which of the following associations (if any) do you belong to? (Check all that apply)

☐ AEE	☐ ASHRAE	☐ CEFPI	☐ IEE	☐ ISFE	☐ NSPMA	☐ USGBC
☐ AFE	☐ ASID	☐ CoreNet	☐ IFMA	☐ NAIOP	☐ PGMS	☐ NONE
☐ AIA	☐ ASIS	☐ CREW	☐ IIDA	☐ NAPE	☐ PRSM	☐ Other
☐ APPA	☐ BOMA	☐ EGSA	☐ IREM	☐ NASFA	☐ SAME	_____
☐ ASHE	☐ CABA	☐ IDCE	☐ ISSA	☐ NFPA	☐ SMRP	_____

Are you planning a project in the next 12 months in any of the following areas?
☐ HVAC ☐ Lighting/Controls ☐ Restroom/Plumbing ☐ Roofing
☐ Security/Access Control ☐ No response

Payment

☐ American Express ☐ MasterCard ☐ Visa
Name on card _____
Card number _____
Exp. Date _____ CVV/Security Code _____
Billing address _____
Signature _____

☐ Check Payable to ROC Exhibitions Inc.
Mail this completed form to arrive no later than February 24, 2014

ROC Exhibitions, Inc.
NFMT2014 Registration
1963 University Lane Lisle, IL 60532

For registration or membership questions please contact Bernice Alcantar at 630-271-8230 or via email at balcantar@rocexhibitions.com

No one under 18 years of age will be admitted to the conference sessions, exhibit hall or other event functions.

Please note that while all Attendees are invited to the exhibition, any attendee who is observed to be soliciting business in the aisles or other public spaces, in another company's booth or in violation of any portion of the IAEE Exhibition Policy will be asked to leave immediately. Please report any violations you may observe to show management.