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# FMJ



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International Facility Management Association

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**THE  
HOW  
TO  
ISSUE**

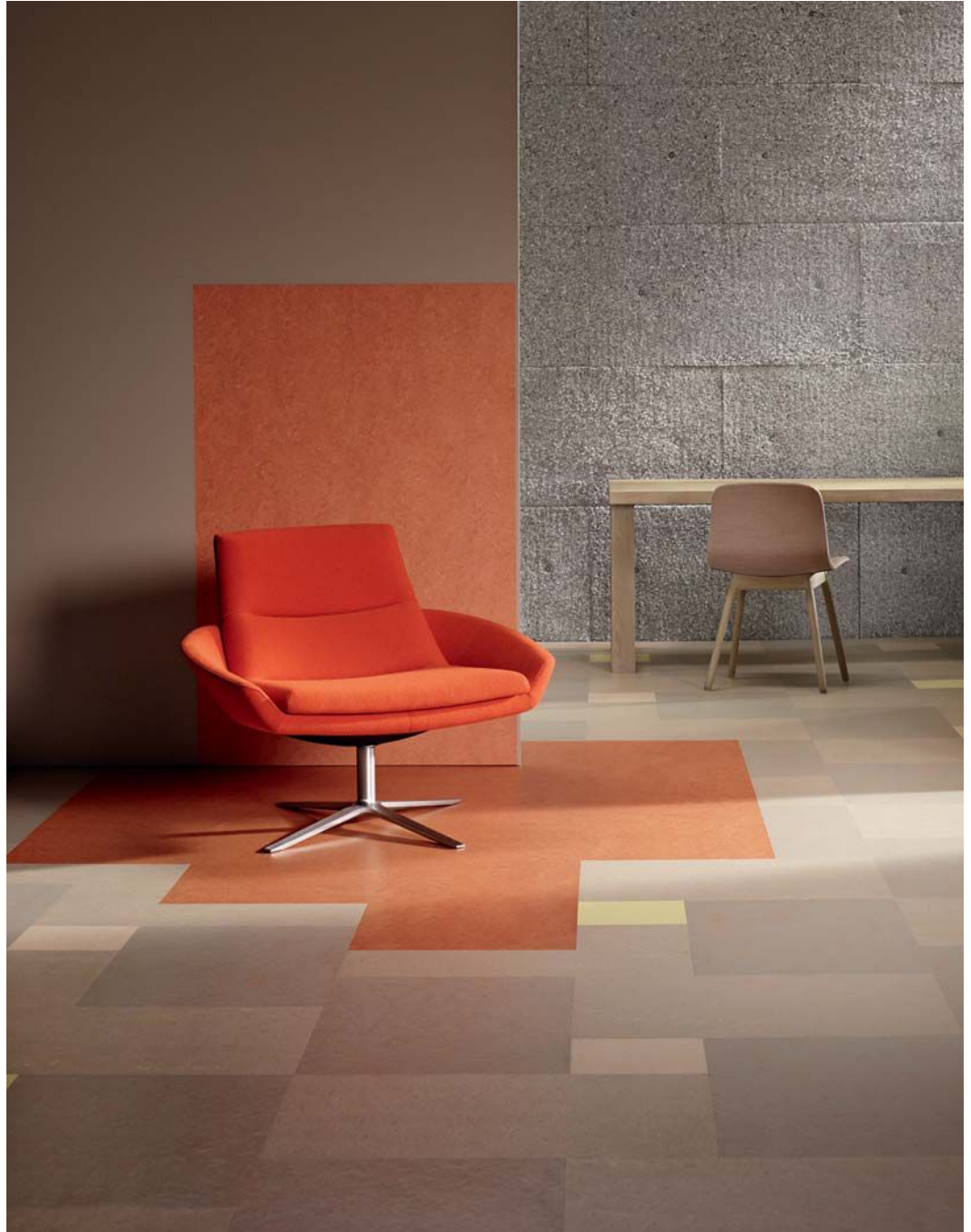
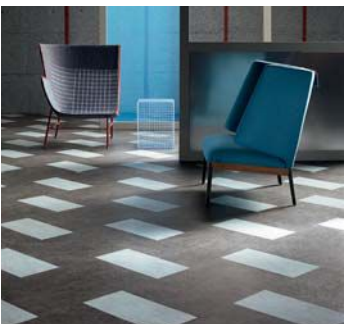
# BUILD A POSITIVE SAFETY CULTURE

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creating better environments



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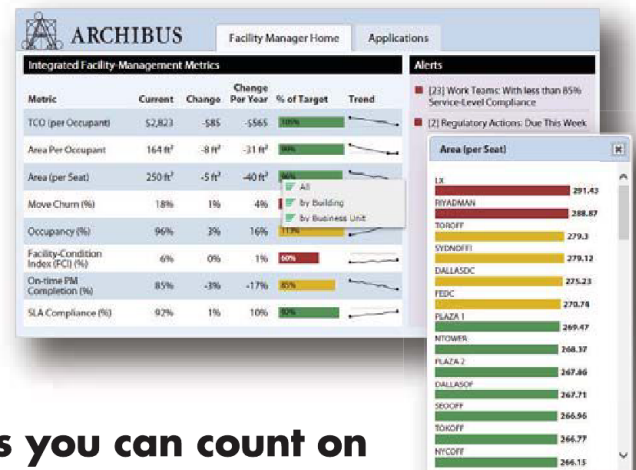


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// MICHELLE KARPMAN

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**BEHIND THE COVER:** Safety culture varies across the field depending on one's needs and work, but taking the time to carefully articulate and craft your process ensures the same positive result. Find out how you can achieve your best work environment on page 18.



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Empowering Facility Professionals Worldwide

### ABOUT IFMA

IFMA is the world's largest and most widely recognized international association for facility management professionals, supporting more than 24,000 members in 94 countries. The association's members, represented in 130 chapters and 17 councils worldwide, manage more than 37 billion square feet of property and annually purchase more than US\$100 billion in products and services. Formed in 1980, IFMA certifies professionals in facility management, conducts research, provides educational programs and produces World Workplace, the world's largest facility management conference and exposition. To join and follow IFMA's social media outlets online, visit the association's LinkedIn, Facebook, YouTube and Twitter pages. For more information, visit the IFMA press room or [www.ifma.org](http://www.ifma.org).

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Check out the interactive version of FMJ, featuring **videos, online extras and more!** FMJ can also be viewed on mobile devices.



### THIS ISSUE

The online version of the publication includes interactive resources.

- **VIDEO:** "Safety Culture: Common Sense Says, 'Don't Walk On By'" to accompany "How to Build a Positive Safety Culture" (p. 18)
- **VIDEO:** "International Terminal Orientation Training" to accompany "Hartsfield-Jackson Atlanta International Airport's Steps to Success" (p. 24)
- **ARTICLE:** "The Qualified Carpet Inspector" to accompany "Diagnosing Unusual Carpet Problems" (p. 29)
- **VIDEO:** "Five Ways to Listen Better" to accompany "Learning to Listen Creates Better Managers" (p. 40)
- **TECHNOLOGY BRIEF:** "Thermal Energy Storage Technology Brief" to accompany "Cooling Efficiency through Energy Storage" (p. 64)
- **VIDEO:** "How to Run an Occupational Health and Safety Meeting" to accompany "Making Occupational Health and Safety Part of Your Organization's DNA" (p. 77)
- **WHITE PAPER:** "Effective Change Order Management" to accompany "The Future of Change Order Management" (p. 85)

### FMJ EXTENDED

This exclusive online section focuses on expanded FM coverage.

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To join and follow IFMA's social media outlets online, visit the association's LinkedIn, Facebook, Twitter, Flickr and YouTube pages.



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Facility Management Journal



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# EDITOR'S COLUMN

**ANDREA SANCHEZ**  
Editor-in-Chief  
Facility Management Journal



It's been almost 10 months since I relocated with my husband's company to Azerbaijan. I must say it ranks as the most adventurous move I've made in life, both literally and figuratively. There is no doubt that this has been an amazing opportunity for my family thus far — living, breathing and in my case, working, in a different culture.

With all of the new sights, sounds, foods and mannerisms, it is easy to get overwhelmed by all of knowledge you don't have. Despite all of the resources out there, the most invaluable piece of our transition were the tips and solutions given by experienced colleagues and locals — those who are part of the culture.

## The quest for knowledge

Similar to my global journey, we are constantly bombarded with information via multiple communication channels on a daily basis. What makes one fact better than another? Who do you believe? Most importantly, how do you keep up with it all?

Life is a lot more manageable when we find a go-to source we can trust — someone who not only knows the material (is part of the culture), but knows what type of material would best suit you and your needs. In facility management, that is IFMA.

On page 12, IFMA President and CEO Tony Keane gives a glimpse into the exciting knowledge strategy initiative taking place. Currently under the leadership of the IFMA Board of Directors' Knowledge Strategy Task Force Chair Kevin O'Toole, the association is in the initial stages of delivering a game-changer for membership value, focusing on delivering and tailoring its best-in-class information to your needs. We have many dedicated members (board directors,

chapter/council leaders, subject matter experts, etc.) already assisting with the effort, as well as more than 200 of you who asked to be contacted further.

The heartbeat to this initiative is all of you.

As the thought leader for facility management, IFMA wants to simplify your quest for knowledge. In the next few weeks we will continue to solicit your input as we determine how to enhance the way we make information available and relevant to our members. Stay tuned for updates and opportunities to share what is most valuable to you. Already intrigued and want to be involved? Email me at [andrea.sanchez@ifma.org](mailto:andrea.sanchez@ifma.org).

## Got tips?

Based on past survey results, many of you expressed an interest in how-to articles. This issue has you covered, from tips on how to listen more effectively to your employees (page 40) to making occupational health and safety part of your organization's DNA (page 77). The following pages are only a glimpse of the best practices, advice and solutions shared by those who understand FM. There are a vast number of additional conversations taking place via IFMA's social media channels and online community (visit [ifma.org](http://ifma.org) to access these sites). This includes FM advice from FMs, those who know the culture the best. You can't get any better than that.

I invite you to join these groups. Life becomes a lot less overwhelming when you find a hand to guide you or an ear to listen. Being a part of IFMA, you are also that hand and ear to others. Our members are what make IFMA an association apart from any other, a network of the best in FM.

Until next issue,

*Andrea*

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## CHAIR'S COLUMN

**JON SELLER**  
Chair, Board of Directors



It's sometimes difficult to fathom how fast a year passes by. My year as chair of this wonderful organization is almost at a close, and I will hand the role to Jim Whittaker at the close of 30 June.

In the past 12 months as an organization IFMA has achieved some amazing things. These include the development of the Essentials education courses, the migration of our sustainability committee into a community of practice, our continuing work with ISO ensuring that IFMA has a voice in the development of global standards, a continuing global government affairs program that will see the words "facility management" continue to be a part of the conversation and much more.

As ever it is our chapter and council leaders, volunteers and staff who maintain the momentum. Our ongoing challenge is to continue and expand this. And there are more interesting developments in the pipeline.

Throughout this year I have had the opportunity to visit a number of chapters and to understand the innovation and best practices that exist. One of our chapters has developed an iPhone app that provides members with access to events, news and more. We are working on a plan to better share this innovation for the benefit of all our members.

In March and April respectively the Facility Fusion Canada and Washington, D.C. conferences were well attended and provided an opportunity for learning, networking and catching up with friends. Slightly different from World Workplace, the Facility Fusion approach is intended to be more focused on personal growth. If you have not yet had the opportunity to attend one of the Facility Fusion events I highly recommend you consider this for the future.

### Connecting with the FM community

As previously mentioned, we have recently created an Environmental Stewardship and Sustainability Community of Practice (ESS COP) and through this launched an online sustainability community via IFMA's newly renovated virtual

community platform. This resource offers members the opportunity to:

- Learn from the collective wisdom of peers
- Connect and interact with FM professionals
- Advance the profession by sharing thoughts on general and specific FM topics

As part of the larger IFMA Community, the Sustainability Community will bring members together virtually to collaborate in planning and implementing strategic sustainability programs. We envisage this topic area as the go-to resource for sustainability in the built environment via peer-to-peer, subject matter expert and council/chapter liaison collaboration, as well as for engagement with sustainability practitioners and SFP® credential holders.

In this first year access to the community is available to all IFMA members at no cost. This is an exciting and effective mechanism for all things sustainable.

### Increasing global reach

Our global footprint is growing. In April the board of directors approved the formation of a new IFMA chapter in Malaysia. Home to some of the world's iconic buildings (including the Petronas Twin Towers in Kuala Lumpur) the new chapter will provide an invaluable resource for existing and new members alike.

In signing off this column I want to let you know that our organization is in good shape. We are robust financially and have exciting new developments underway that will continue to enhance our member experience.

I'd like to thank the directors who have served on the board served with me this year, as well as IFMA's hard-working staff and chapter and council leaders for their never-ending commitment to this profession.

Next stop — the World Workplace 2014 Conference and Expo in New Orleans, La., one of the most fun cities in the world. I hope to see you there on Sept. 17-19.

# THE SCIENTIFIC METHOD

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## PRESIDENT'S COLUMN

**TONY KEANE, CAE**  
President and Chief Executive Officer



The underlying theme of this issue is “Tips and Solutions.” On the surface it sounds very logical and ordinary. However, when you start to think about the concept and how we utilize tips and solutions every day, we need to hit the pause button and contemplate the sources of our information. How do we know the quality of information we receive? How resourceful are we in seeking out leading-edge solutions? With today’s data overload, where do we go to seek wisdom that shines above the millions of details thrown at us every day?

IFMA is here to help you in seeking FM wisdom.

Associations have historically published a tremendous amount of information and presented that information through existing channels. Prior to the Web, those channels were limited to either print or face-to-face contact. Today we have a plethora of channels through which members can receive information. Each of our members makes choices about how he or she wants to receive information, so IFMA distributes through all viable, justifiable channels. However, the use of multiple channels can cause information overload and create opportunities for anybody to become a publisher of information. This takes us back to the original question: How do we know that the “tips and solutions” we come across are valid?

IFMA as an association offers the first step in qualifying information. It is easy to join a LinkedIn group for free and exchange information or ideas. Be careful, though — some of these FM groups are not operated by FM experts. There are risks in accepting the credibility of non-IFMA groups unless you personally know the source of the information.

The value placed on information is critical to its usefulness. If you look at the source profile and see the person is an IFMA member, you will likely assign a higher value to the information because this person has made the effort to seek knowledge and possibly education from a trusted source: IFMA. If the person is in the FM profession and hasn’t made the effort to join the professional association, then perhaps it is worth asking “Why not?”

IFMA has launched a new virtual community platform at [community.ifma.org](http://community.ifma.org) to facilitate the exchange of tips and solutions among IFMA members. This will make it easier for


you to find trusted information sources who have made the effort to belong to the world’s premier facility management organization. The additional step of obtaining a credential like the FMP, SFP® or CFM® indicates an even higher commitment to ongoing FM learning, marking those contributors as invaluable resources.

Facilitating the exchange of information between members is a primary objective of IFMA. The exchange of information to provide the tips and solutions is found through many channels: FMJ, World Workplace, Facility Fusion, IFMA social media outlets, IFMA resource center, IFMA Foundation, IFMA’s Benchmark Exchange (BEX), online courses, IFMA credentials (FMP, SFP® and CFM®) and our new Essentials of FM course.

IFMA is not stopping there, as we realize that the biggest value we can offer for members is access to tips and solutions when you need them, not necessarily on our publishing schedule. To this end, our staff and board are working together to develop IFMA’s knowledge management strategy. This will yield significant enhancements to the accessibility of FM information and will help connect trends. The knowledge management strategy is a major initiative that will revolutionize IFMA in the coming years and provide immeasurable value for your career. More to come on this exciting topic.

I would like to say thank you to our Ottawa Chapter for helping IFMA host the first Facility Fusion event in Canada, and for the hospitality shown recently by our Brussels, Belgium and Milan Chapters plus our IFMA Alliance Partners Facility Management Netherlands (FMN) and Bulgaria Facility Management Association (BGFMA). Thank you also to the IFMA Capital and Chesapeake Chapters for their role in facilitating the 2014 Facility Fusion Conference and Expo held in Washington, D.C. in April.

IFMA continues to grow. Are all of your colleagues members? If not, don’t leave them out of the world’s premier FM association — invite someone to join today!



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## EPA releases list of top 25 U.S. cities with most Energy Star buildings

The Environmental Protection Agency (EPA) has announced its sixth annual list of top 25 U.S. metropolitan areas with the most Energy Star-certified buildings. The cities on this list demonstrate the economic and environmental benefits achieved by facility owners and managers when they apply a proven energy efficiency approach to their buildings.

The top 10 cities on the list are: Los Angeles; Washington, D.C.; Atlanta; New York; San Francisco; Chicago; Dallas; Denver; Philadelphia and Houston.

Energy use in commercial buildings accounts for 17 percent of U.S. greenhouse gas emissions at a cost of more than US\$100 billion per year. Energy Star-certified office buildings cost US\$0.50 less per square foot to operate than average office buildings and use an average of nearly two times less energy per square foot.

More than 23,000 buildings across America earned EPA's Energy Star certification by the end of 2013. These buildings saved more than US\$3.1 billion on utility bills and prevented greenhouse gas emissions equal to the annual electricity use from 2.2 million homes.

First released in 2008, the list of cities with the most Energy Star-certified buildings continues to demonstrate how cities are embracing energy efficiency as a simple and effective way to save money and prevent pollution. Los Angeles has remained the top city since 2008 while Washington, D.C. continues to hold onto second place. Atlanta moved up from number five to number three and for the first time, Philadelphia entered the top 10.

## Annual revenue of equipment for commercial building automation systems forecast to reach US\$34.7 billion by 2021

Offering automated, granular, real-time control of every major system within commercial buildings, networked building controls can provide building owners and operators with significant cost savings through the more efficient use of energy. As large commercial buildings are increasingly targeted by national and local energy efficiency policies, building owners are looking for solutions that can reduce energy consumption and improve operational efficiency.

According to a recent report from Navigant Research, worldwide revenue from networking and communications equipment for commercial building automation systems will grow from US\$21.3 billion in 2014 to US\$34.7 billion by 2021.

China, which is the largest and fastest-growing market in the world, is a key growth market for building controls, according to the report. The country is focused on maintaining its current building stock while constructing the equivalent of two Chicago-sized cities per year through 2025. The rest of the world

is more focused on bringing its existing stock of buildings up to par in terms of energy efficiency, as well as integrating advanced IT-level control functions for easier and more efficient data analysis and system management.

The report, "Smart Buildings Networking and Communications," analyzes the global market opportunity for networked building automation controls across three primary levels of the building controls ecosystem: field devices, floor/room-level devices and building-level devices. Each of these categories contains devices used in four primary building systems: HVAC, lighting, fire and life safety, and security and access. Global market forecasts for unit shipments and revenue, broken out by region, segment, device type and technology, extend through 2021.

The report also provides a comprehensive assessment of the demand drivers, business models, policy factors, technology issues and key industry players associated with this rapidly evolving market.

## ISS completes divestment of commercial security activities in Pacific Region

ISS, a leading global facility services provider and Gold-level Corporate Sustaining Partner of IFMA, has completed the sale of its commercial security activities in Australia and New Zealand to Wilson Security.

ISS will continue to provide security services at major airports in Australia. ISS is the largest provider of airport security services in Australia, covering 13 airports.

The revenue of the divested activities was DKK 832 million in 2013. ISS intends to use the net proceeds of approximately DKK 110 million for further deleveraging of the company. The outlook for 2014 remains unchanged,

and has as expected been updated to reflect the already announced impact of the divestment of the commercial security activities in Australia and New Zealand on total revenue growth for 2014.

The company's organic revenue growth in 2014 is expected to be 3 to 4 percent, while divestments, acquisitions and changes in foreign exchange rates are expected to negatively impact revenue growth. This outlook includes divestments comprising landscaping activities in France, pest control activities in India, security activities in Israel, HVAC activities in Belgium and commercial security activities in Australia and New Zealand.



IFMA presents Facility Engineering Associates with the Top Sustainable Exhibitor award at the 2014 Facility Fusion event in Washington, D.C.

## IFMA recognizes leaders in sustainability

IFMA brought achievements in sustainability to center stage with the recognition of sustainable exhibitors at the Facility Fusion Conference and Expo held April 15-17 in Washington, D.C.

IFMA's Sustainable Exhibitor Award is a voluntary program that recognizes those who demonstrate a commitment to sustainability through environmentally conscious exhibit practices and is part of IFMA's overall conference sustainability strategy.

Exhibitors participating in IFMA's Facility Fusion Conference and Expo were invited to complete and submit the IFMA Exhibitor Sustainability Scorecard,

which was developed in partnership with and scored by the Leonardo Academy, a third-party nonprofit organization that specializes in sustainability solutions. Submissions were evaluated on the following six categories:

- The exhibiting organization's sustainability policies
- Exhibit materials
- Travel, packing, shipping and freight
- Printed materials and giveaways
- Recycling and reuse of exhibit materials
- Sustainable products and services

IFMA is pleased to recognize the top three sustainable exhibitors from this year's U.S.

Facility Fusion Conference and Expo in Washington, D.C.:

1. Facility Engineering Associates
2. Concert Technologies
3. ZIA for Buildings

Also at Facility Fusion, the U.S. Department of Energy joined Lighting Energy Efficiency in Parking (LEEP) campaign co-organizers (including IFMA) in recognizing 12 organizations for efficient lighting in parking spaces. The awards were given as part of the energy department's LEEP campaign, which is credited for commitments to install efficient lighting across more than 270 million square feet of parking space, cutting energy use by up to 90 percent.

## CORT acquires AA Party Rentals

CORT, a Berkshire Hathaway Company and 26-year Corporate Sustaining Partner of IFMA, has announced the acquisition of AA Party Rentals in Mountlake Terrace and Tacoma, Wash. For more than 40 years, AA Party Rentals has provided top-quality rental equipment and services for consumer business including weddings and parties and to caterers, event planners and venues in the greater Seattle and Tacoma markets.

AA Party Rentals joins ABC Special Event Rentals by CORT and CORT Events in the Seattle market. AA Party Rentals will continue to operate independently. This acquisition provides customers with convenient access to an even broader range of event and party rental products and services than they had before, including tents and canopies of all sizes, flooring, tables, chairs, china, specialty linens, a wide variety of tableware and more.

## U.S. military breaks new ground with largest solar installation

The U.S. General Services Administration (GSA) and the U.S. Army have marked the start of a major renewable energy project at Fort Huachuca, Arizona that will be the Department of Defense's largest solar installation. The 155-acre project leverages private financing and is expected to exceed 18 megawatts of clean power and provide 25 percent of the military base's power. Officials kicked off the project with a groundbreaking ceremony at the base on April 25.

### Project details:

- Solar photovoltaic (PV) panels will be installed on a 155-acre parcel of land on Fort Huachuca.
- The project will utilize the existing GSA area-wide public utility contract and Tucson Electric Power (TEP) will provide electric service at Arizona Corporation Commission-approved rates.
- TEP will fund, own and operate the solar PV project and has contracted with industry partner E.ON for the system's design, engineering, procurement and construction management.
- As the utility provider, TEP is uniquely positioned to

streamline the interconnection process through the TEP-owned Fort Huachuca substation, thereby reducing interconnection costs and improving system reliability.

- Construction is set to begin immediately and the PV panels will begin providing clean, renewable energy to the base in the fall of 2014.

The project is a collaboration between GSA, the Army Energy Initiatives Task Force, Fort Huachuca, TEP and its developer E.ON Climate & Renewables. The deal was struck using a GSA area-wide public utility contract, which allows federal agencies to get the utility services they need to serve the American people. Under the agreement, TEP will fund, own, maintain and operate the project, and contract with E.ON for the design, engineering, procurement and construction. The new solar panels will ease stress on the local power grid.

Beyond providing Fort Huachuca electricity options, the project promotes the U.S. Army's energy security objectives. The base will now have the ability to "island" and run electric power completely off the grid using its solar power source when needed.

## IFMA to host Virtual Career Fair

The International Facility Management Association will host its first Virtual Career Fair on Wednesday, June 11, 2014 from 12-3 p.m. CDT. This online event will connect job seekers directly with employers that have open facility management career opportunities.

Attendance is free for job seekers and is open to both IFMA members and prospective members. Interested parties can register to attend and companies can learn how to post job

opportunities by visiting <http://bit.ly/1gXSDis>.

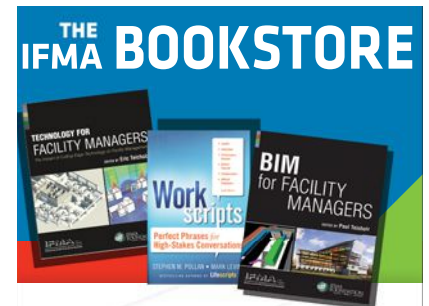
Attendees of IFMA's virtual career fair will find employers looking to hire FM talent. They'll identify specific opportunities as well as additional information about each hiring organization. Job seekers will be able to choose which employers to interact with and then engage in one-on-one chats directly with recruiters at those organizations.

## Johnson Controls ranks on best corporate citizens list

Johnson Controls has been ranked 12<sup>th</sup> on Corporate Responsibility magazine's 15<sup>th</sup> annual "100 Best Corporate Citizens List." The company's ranking was based on its performance in seven key areas: environment, climate change, employee relations, human rights, governance, finance and philanthropy. Johnson Controls, a global multi-industrial company, moved up from a ranking of 14 in 2013.

The "100 Best Corporate Citizens List" was first published in 1999 in Business Ethics magazine and has been managed by CR magazine since 2007.

To compile the list, every company in the Russell 1000, the highest ranked stocks in the Russell 3000 Index of publicly held U.S. companies, is ranked according to 298 data points. The methodology for generating the list is governed by a Ratings and Rankings Committee of the Corporate Responsibility Officers Association.



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Safety Culture:  
Common Sense Says,  
'Don't Walk On By'

HOW  
TO

# BUILD A POSITIVE SAFETY CULTURE

BY MICHELLE KARPMAN

**O**n January 28, 1986 people around the world watched as the Space Shuttle Challenger exploded less than two minutes after lift-off.<sup>1</sup> On April 5, 2010, a series of explosions occurred in the Upper Big Branch mine in West Virginia killing 29 coal miners who worked for Performance Coal Company, a subsidiary of Massey Energy Company.<sup>2</sup> On April 13, 2011 undergraduate students discovered the dead body of Michele Dufault with her hair tangled in a lathe in Yale University's Sterling Chemistry laboratory.<sup>3</sup>

Even though these events seem unrelated, they have one common denominator. They are deadly examples of what occurs when the safety culture within an organization weakens and fails.

## What is safety culture?

Safety culture is a sub-component of the culture of an organization. Culture within an organization can be defined as "the way we do things around here" and refers to the factors that influence attitudes and behaviors in organizations. Culture binds together different components and systems within an organization in the pursuit of its mission and goals. Nothing is too trivial or too much trouble for organizations with strong cultures. Every member works to ensure things are done the right way.<sup>4</sup>

Culture influences and affects behaviors at the individual and group level and includes an organization's leadership and management style, mission and goals as well as work processes. The culture of an

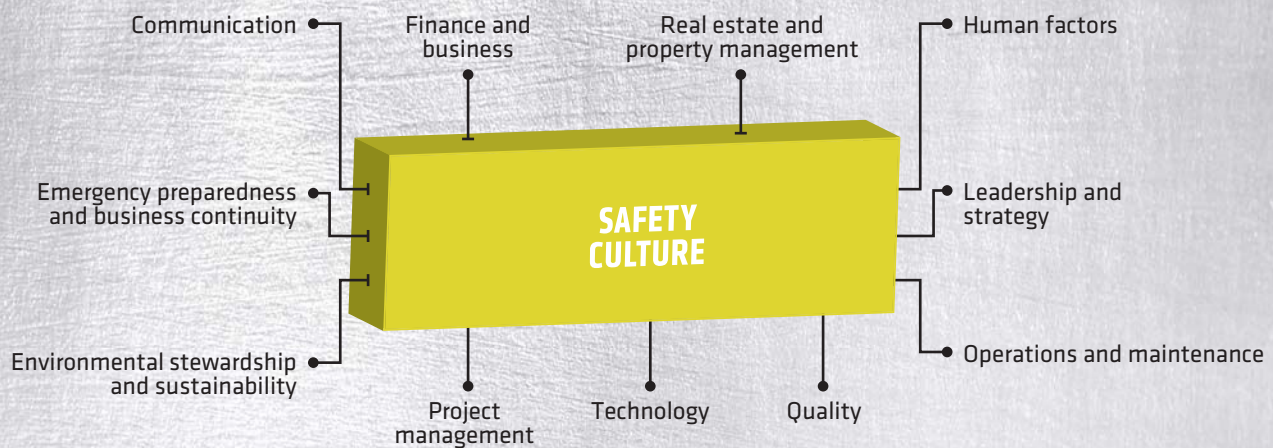
organization is strongly associated with worker perceptions of the performance of day-to-day job tasks in conjunction with organizational functions. Therefore, an organization's culture directly influences its safety culture.<sup>5</sup> The U.S. Nuclear Regulatory Commission's final Safety Culture Policy Statement defines safety culture as "An organization's collective commitment, by leaders and individuals, to emphasize safety as an overriding priority to competing goals and other considerations to ensure protection of people and the environment."<sup>6</sup>

## Need for a strong, positive safety culture and how to build one

The safety culture of an organization is pivotal in promoting the importance of safety to members. Safety is a positive

# THE BEST WAY TO BUILD AND MAINTAIN A POSITIVE SAFETY CULTURE WITHIN AN ORGANIZATION IS WHEN THE FACILITY MANAGER LEADS BY EXAMPLE.

FIGURE 17



value that prevents injuries, saves lives and improves productivity and outcomes. When an organization's leadership instills safety as a core value, it nurtures an environment of confidence and caring for all who work online.<sup>6</sup>

Effective and committed leadership set the direction and strength of the safety culture within an organization. Leadership and management, as a vital key to building a strong safety culture, should seek to: inspire others, seek open and transparent communication, accept responsibility for safety yet hold others accountable, and most importantly, lead by example.<sup>6</sup>

Building a solid safety culture depends on understanding that safety awareness

is a long-term effort where safety is highlighted repeatedly. Organizations can adopt a safety ethic which extols the values of safety such as working safely, preventing risky behavior, promoting safety and accepting responsibility for safety.<sup>6</sup>

Lessons learned from past mistakes or incidents are useful tools when developing a strong safety culture. Engaging employees in analyzing case studies provide an opportunity for them to think about strategies that could have prevented these incidents. Employees can use these scenarios to determine their role in developing and fostering a positive safety culture within their own organization.<sup>6</sup> An excellent resource for real-world

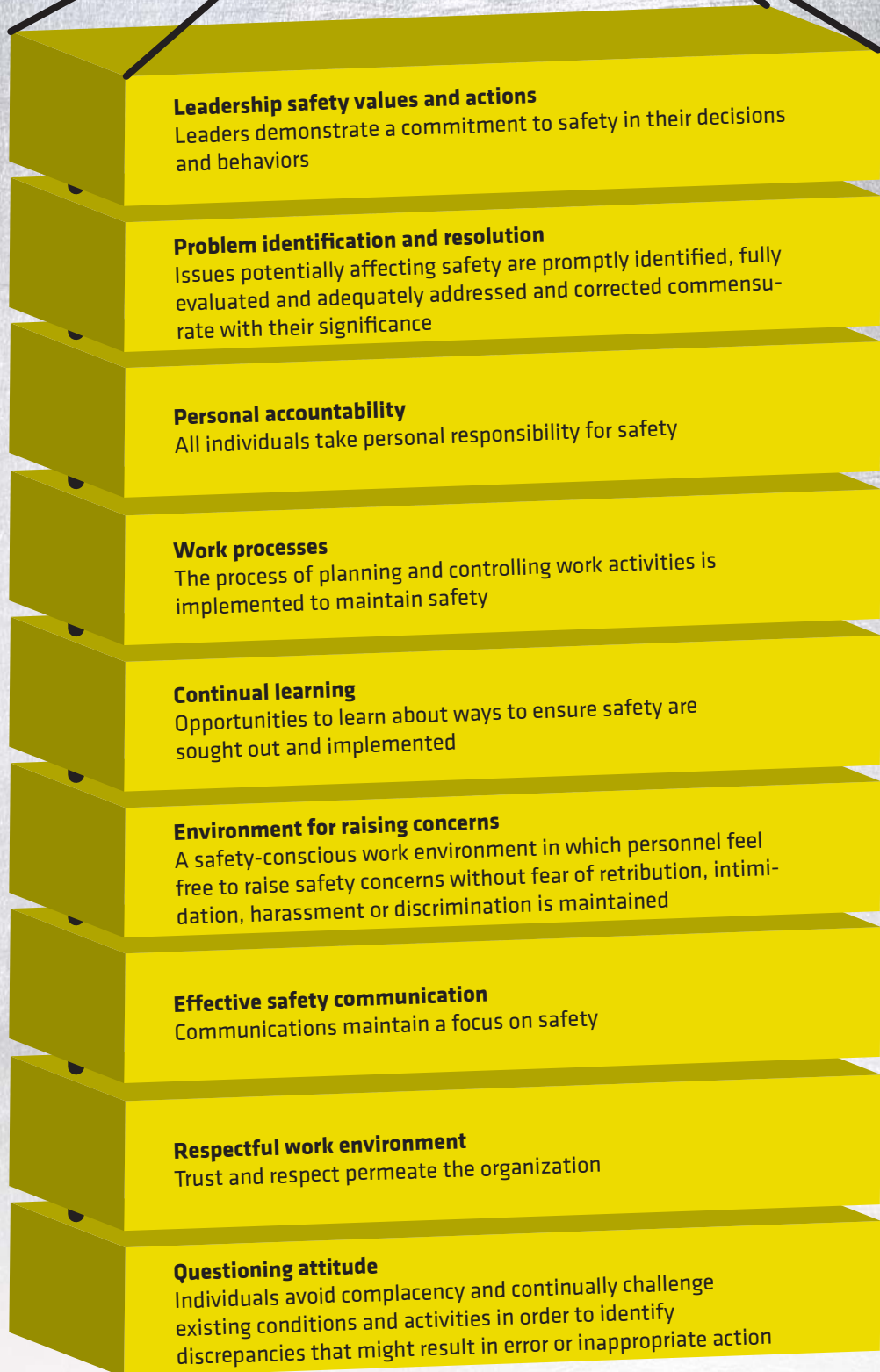
case studies in safety culture were developed by the United States Nuclear Regulatory Commission and can be accessed online.<sup>2</sup>

Developing a positive safety culture further depends on the continued advocacy of a strong safety program. Promoting safety can be as simple as establishing a suggestion box as a system for identifying safety concerns or advertising the importance of safety in newsletters, bulletins or open seminars. Another way to promote positive safety is through a recognition system for good safety performance.<sup>6</sup>

## **The role of the facility manager**

The role of a facility manager is multifaceted and varies across

# POSITIVE SAFETY CULTURE TRAITS



*Adapted from the U.S. Nuclear Regulatory Commission, Safety Culture Communicator, March 2012.<sup>2</sup>*



organizations and sectors. Whether your organization is comprised of two or two thousand, safety culture impacts every aspect of the work environment and interrelates with each of the core competencies of the facility management profession (Figure 1).<sup>7</sup>

Safety culture should not be confused with environmental and occupational health and safety, as these are programs governed by rules and regulations. Safety culture influences all levels of an organization and is the reflection of an individual's level of awareness and accountability for safety.<sup>5</sup>

The one constant in an organization is the concept of change. If facility managers want to build and maintain a positive safety culture, they should understand that the relationship between safety culture perceptions and actual behavior is crucial. The safety culture of an organization, no matter the size or industry is also important for contractors and sub-contractors who work in your facility.

The organization's safety culture sets the standard for attitudes and behaviors in

## DEVELOPING A POSITIVE SAFETY CULTURE DEPENDS ON THE CONTINUED ADVOCACY OF A STRONG SAFETY PROGRAM.

the facility. When direct employees of the organization and contractors witness management's commitment to a safe work environment they are more likely to work in a manner which positively impacts the organization's quality, reliability, competitiveness and profitability. Undoubtedly the best way to build and maintain a positive safety culture within an organization is when the facility manager leads by example (Figure 2).<sup>4</sup> **FMJ**

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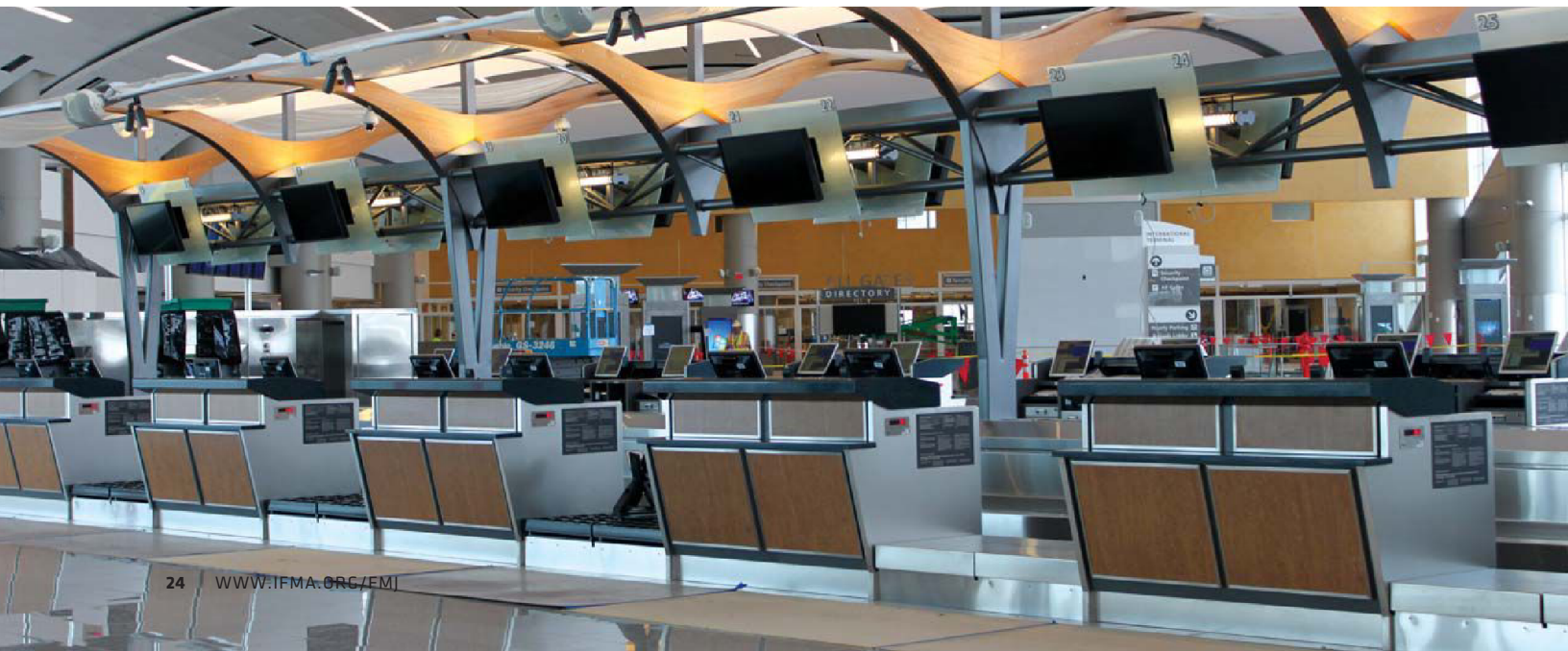
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International  
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# HARTSFIELD-JACKSON ATLANTA INTERNATIONAL AIRPORT'S **Steps to Success**



As the late Steve Jobs once said,

“  
Be a  
yardstick of  
quality.  
Some people  
aren't used  
to an  
environment  
where  
excellence  
is expected.”

Demonstrating that yardstick of quality, Hartsfield-Jackson Atlanta International Airport (ATL) recently launched an operational assessment of its terminal complex and processes in order to improve quality and customer satisfaction.

The project, a joint effort by the City of Atlanta Department of Aviation, AECOM and the Georgia Institute of Technology, involved a number of peer airport executives, as well as the Airport Facilities Council of IFMA, in conducting surveys and research into operational best practices that could contribute improvements and savings to the airport.

These best practices are also meant to be shared with the airport community and others who could benefit from similar practices. This article should be seen as the start of collaboration and identification of best practices. While some practices focused on airport-specific equipment or processes, most findings were found to be best practices for facility management overall.

#### First steps

One of the first steps was a face-to-face meeting among ATL staff and several North American large-hub airports to share ideas and individual best practices. Atlanta was host to facility executives from Dallas, Los Angeles, Miami and Toronto, who all shared their current conditions and policies. A number of similarities were found, but a few unique ideas also came from the initial meeting. Atlanta learned that it was already demonstrating some tactical best practices with its automated compacting trash receptacles, but wanted to gain a better understanding of how others do similar things and learn from the best.

The project used a research method called Delphi survey. This process allows experts to provide input anonymously and receive feedback on their responses in order to reach agreement on what is considered the best decision, practice or solution regarding a particular issue. Through a series of two anonymous surveys, airport staff, experts on facility operations and IFMA Airport Facilities Council members responded to questions to help identify and prioritize areas of importance.

This, in addition to supplemental research on best practices, led to understanding in all areas of facility management, but focused on the ability to manage people, facilities, services and resources. Initial findings from the assessment centered on five major areas seen as best-practice models. These include:

- **Maintainability** – Influencing decisions for ongoing maintenance.
- **Total cost of operations** – Providing standard metrics and benchmarking across the full life cycle of assets.
- **Risk management** – Utilizing concepts and expertise in risk management to improve operational practices and decision making.
- **Data-driven decision making** – Leveraging objective common measurements to guide decisions.
- **Sustainability** – Identifying and implementing sustainable practices.

Within that framework, the three categories found for major improvement were: 1) Processes and practices for maintenance and operations, 2) Contracting and outsourcing of facility services and 3) Processes and impacts of sustainability efforts. These all relate specifically to the Atlanta terminal complex, but are generally seen in the surveys and workshop as areas for increased attention or improvements for all participants in the project.

### Facility condition index

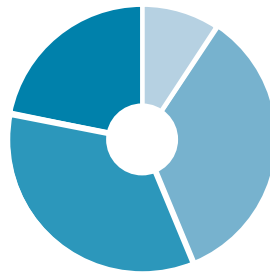
In order to improve maintenance and operations practices, one best practice is the use of facility condition index (FCI), which represents the maintenance, repair and replacement deficiencies of the facility/the current replacement value of the facility. It is a tool to measure building performance compared to expectations, and is used in FM to provide a benchmark to compare the relative condition of a group of facilities.

Just over 78 percent of respondents to the first survey agreed that FCI is an important scorecard or metric. No one disagreed, but 22 percent were neutral on this topic, possibly indicating unfamiliarity with FCI or its use in their situations. Therefore, a calculated FCI expectation can be set as a best practice for airport maintenance and operations. We believe this also applies generally to good facility management practice.

FCI is the full review and documentation of current conditions within a facility, a tool used by many facility organizations as an important starting point or baseline for measuring improvement and success in FM. A comprehensive FCI and assessment will provide details that help the FM organization:

- Compare facility conditions to estimate the costs of needed repairs and renovations.
- Define requirements to solve problems, develop master plan baselines and deliver credible and defensible data on each facility.
- Forecast facility conditions and project funding scenarios to meet expected conditions.

### How efficient is a Facility Condition Index (FCI) in terms of performing score cards proven over time?



- EXTREMELY IMPORTANT
- VERY IMPORTANT
- SOMEWHAT IMPORTANT
- NEUTRAL

### FM PROCUREMENT PROCESS

#### SERVICE STRATEGY

- Specifications for requirements
- Expected service levels

#### DELIVERY STRATEGY

- Delivery models
- Service bundling
- Communication and coordination

#### PROCUREMENT STRATEGY

- Limits of project
- Risk management
- Contract duration
- Contract framework

#### MONITORING STRATEGY

- Key performance indicators (KPIs)
- Reporting
- Financial controls

- Maintain data that allows development of future budgets, short-term events requirements, forecasts for future investments and prioritization of funding schemes.

Effective use of FCI assessment provides the data for better decision making, can provide standardized metrics for total life cycle costs, reduces risk by identifying and prioritizing needs, improves maintenance with prioritized needs and identifies areas for sustainability impacts. Therefore, FCI assessment is a tool to help meet all five areas of best practice identified in the project's initial findings.

### Contracting and procurement

Another area providing best practice potential focuses on procurement processes. A four-phase approach to FM procurement was recommended,

including establishment of strategies for service, delivery, procurement and monitoring. Each of these requires standardizing policies that improve expectations from users, the finance department and the FM organization.

Another area impacted by procurement and almost every other aspect of contracted services is the link between the provider's information system, generally a computerized maintenance management system (CMMS), and the owner's systems. Incompatibility between these systems is a major cause for owners to be unaware of issues, since they have no direct insight into the system. A common practice is the requirement that those providing facility services deliver information in formats that synchronize with the client software.

This requirement should be part of initial requests for proposals (RFPs) and should be negotiated if two different systems are in place within the organizations. Our surveys demonstrated that 93 percent of respondents believe that vendor contracts should include specifications for delivery of data in formats that match existing airport reporting systems. This is also supported by industry benchmarks indicating increased use of performance monitoring software to manage FM contract performance and ensure performance levels are as agreed in service-level agreements (Waste & Resources Action Programme, 2013).

### Sustainability

A third important area for improvement centered on processes and impacts of sustainability efforts and how to effectively measure and report them. As a new area of responsibility for many FM organizations, these findings resonated with more than 84 percent of respondents. One initial survey question asked about sustainability as a key factor in decision-making about upgrades; it generated 84 percent agreement. To further understand the use of sustainability goals as a catalyst to achieve other performance goals while considering cost and efficiency, the second survey showed that a discussion focused on savings and improvements, rather than

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on “saving the environment,” can be much more successful and advance sustainability initiatives much faster. Facilities can easily adopt a number of improved technologies, such as state-of-the-art lighting technologies like lighting energy efficiency in parking systems, which can last two to five times longer than traditional outdoor lights. These systems pay for themselves quickly by cutting energy costs by up to 70 percent and reducing maintenance costs by up to 90 percent (FMJ, 2013). Simple upgrades like these improve performance, save costs and often increase customer satisfaction at the same time.

Supplemental research indicates that sustainability continues to be a game-changer and is gradually becoming more ingrained in most cultures and businesses that realize that focusing on sustainability can provide greater opportunities for elevating it to strategic levels. With more governments regulating energy and building requirements to meet sustainability standards, the best organizations are not waiting but implementing more sustainable initiatives earlier than mandated. As a result, they benefit from savings and good public relations.

**Benchmarking**

One area that seems to always draw attention and interest is in comparing specific information, or benchmarking. This project was established to primarily focus on best practices, but, like most facility managers, the respondents mentioned many times that comparative information, benchmarking and better understanding of specific measures would also be helpful. One recommendation from the project was to form a benchmarking group during early 2014 to include interested top-20 airport FM executives. Alternately, the IFMA Airport Facilities Council could be leveraged to dedicate efforts in online benchmarking portals such as IFMA’s Benchmarks Exchange (BEX).

Specific to the airport industry but not to facility management overall, the need to understand metrics and key performance indicators is critical to demonstrating value of the FM organization and budgets.

Results from this study had more than 93 percent showing interest in participating in a benchmarking effort. This was not surprising, based on the understanding that most FM professionals use metrics and benchmarking to compare themselves to others and determine whether they are good, better or best-in-class in each area.

**Conclusions**

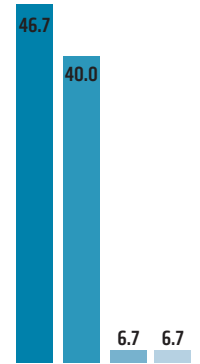
None of the key conclusions found by the Atlanta Airport during its terminal complex operational assessment was especially surprising. However, the effort of documenting best practices — and determining how closely ATL followed those best practices — gave the airport’s FM team the backup needed to recommend changes, improvements and investments in new processes, technologies and contract requirements, as highlighted in AECOM’s final report. Among those recommendations:

- Adopt routine facility condition assessment processes.
- Compare facility conditions to estimate the cost of needed repairs and renovations.
- Maintain data to assist in developing future budgets and short- and long-term strategic planning, forecasting future investments and highlighting parity and equity issues among buildings.
- Include expected service levels, communications and coordination, risk management, key performance indicators, reporting requirements and financial controls in RFPs.
- Establish ongoing regular meetings with contractors to review and discuss lease requirements.
- Require specific reporting from contractors.

As Michael Cheyne, A.A.E., PMP, SFP, director, asset management and sustainability division for the City of Atlanta Department of Aviation, Office of Planning & Development, noted, “In the aviation industry, we often recreate the wheel where, instead, we can build on and strengthen our industry through enhanced collaboration and continual improvement in the development of best practices.” **FMJ**

**Would you or your airport be interested in participating in an airport benchmarking initiative?**

RESPONSE	RESPONSE COUNT
Fully agree	7
Agree	6
Somewhat agree	1
Neutral	1



**Michael Cheyne, A.A.E., PMP, SFP,** is Director of Asset Management and Sustainability for the Department of Aviation Hartsfield-Jackson Atlanta

International Airport and brings 30 years of experience in aviation and public administration to the world’s busiest airport. He currently oversees the airport’s assets, implementation of the sustainable management plan, GIS and public art programs. Cheyne originally came to Hartsfield-Jackson as director of planning and was interim commissioner of public works for the City of Atlanta.

Before joining the Hartsfield-Jackson team, Cheyne’s positions included executive director for the Ports of Friday Harbor and Edmonds and 18 years with Sea-Tac International Airport. While at Sea-Tac, Cheyne was responsible for more than US\$1 billion in capital projects, including program lead for Sea-Tac’s third runway; served as director of the Port of Seattle’s international consulting services; and was director of aviation planning.



**Kathy O. Roper, IFMA Fellow, CFM, MCR, LEED AP,** is Associate Professor and Director of the Master’s program in the School of Building Construction at

Georgia Institute of Technology in Atlanta. Prior to coming to Georgia Tech in 2002, she practiced facility management and corporate real estate for corporate, government and not-for-profits for more than 20 years.

Roper was 2011-2012 chair of the IFMA board of directors, having served on the board since 2008, and was a member of the Atlanta Chapter of IFMA board of directors for more than 15 years, serving as president in 1997. Roper is co-founder and co-editor of the International Journal of Facility Management, launched in 2009. She is co-author of “The Facility Management Handbook, Fourth Edition,” and she also writes regularly for other academic and professional journals and conferences.



The Qualified  
Carpet  
Inspector



# DIAGNOSING UNUSUAL CARPET PROBLEMS

BY JOE VERSLUIS

In most medium- to large-sized facilities, carpeting is maintained either by the facility's contract cleaner or by a professional carpet cleaning company. In either case, the contract typically calls for many visits to the facility each month to spot clean carpets, perform interim cleaning (bonnet or encapsulation) and complete restoration using carpet extractors on a set schedule.

# CARPET CAN BE LESS COSTLY TO PURCHASE AND, OVER TIME, LESS COSTLY TO MAINTAIN THAN HARD-SURFACE FLOORS.

This system usually works well, and as long as restoration is performed at least once or twice per year — or more often in heavily soiled areas — carpets will stay clean and healthy, helping to protect indoor air quality and provide the appearance most facility managers want for their buildings. But what about when there are problems—for instance, when after the carpets are cleaned with an extractor there are areas that appear as if they never dried? While these unusual problems tend to be few and far between, they do happen. Knowledge of these unique situations allows FM's to better address and rectify them.

## “Carpet-never-dries” syndrome

One common problem, especially in large carpeted areas such as in hotel ballrooms, is when areas of the carpet look from a distance as if they have not dried. This phenomenon is sometimes called pooling or watermarking. Often this is noticeable after carpets have been cleaned, typically using the extraction method. For this reason, the technicians who clean the carpet are often blamed.

However, the technicians are not at fault. Further, there usually is nothing wrong with the carpet or how it was cleaned. The darker patches are caused by the way light reflects over the carpet fibers in those areas due to something called pile reversal. For some reason, the way the pile sits on the carpet has changed, or reversed, causing some areas to appear darker and others lighter. While this is not due to any error on the part of the

technician, it does often happen after carpet extraction.

Knowing what pile reversal looks like and that it can happen, especially in large open areas, will help you to recognize the occurrence and that, while unsightly, it is not a problem with the cleaning process or the carpet itself.

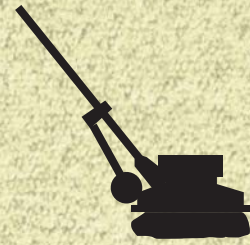
Unfortunately, there are no easy fixes for pile reversal. Carpet manufacturers have tried various methods to eliminate this problem but have met with only limited success. In some cases, time alone will take care of the problem and the pile will reverse itself again. Sometimes pile reversal can be eliminated or at least minimized through thorough vacuuming, by raking the carpet or by re-extracting the problem area.

## Dark carpet under doors

Another problem that might seem unusual but is actually quite common and can fortunately often be corrected is when dark areas build up on carpets under door entries, around HVAC vents (both intake and outflow) installed either in the floor or at the bottoms of walls, on the edges of stairs or, in a home, around the fireplace. This is called filtration soiling.

Filtration soiling occurs in areas where there is concentrated airflow, bringing with it fine dust, soils and contaminants. Over time, these soils and contaminants build up on the immediate carpet area and cause the carpet to darken.

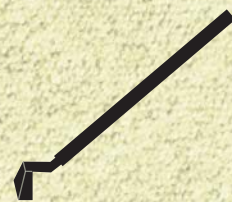
## INTERIM AND RESTORATION CARPET CLEANING METHODS



**Bonnet cleaning** is typically performed by soaking a bonnet, which attaches to the bottom of a floor machine, in a cleaning solution. As the machine moves over the carpet, the bonnet agitates the carpet, helping to remove soils mainly at the higher end of carpet fibers. (This is similar to carpet shampooing; however, the shampoo method is rarely used anymore.)



**Encapsulation** is essentially a dry-cleaning method. With this method, the technician sprinkles a chemical solution over the carpet that encapsulates or entraps soils in carpet fibers. He or she then uses a cylindrical brush or machine with rotating brushes to agitate the carpet and work the solution into the fibers. Finally, the technician vacuums the carpet, removing more of the encapsulating solution and soils with each subsequent vacuuming.



**Extraction** is considered the most thorough way to clean carpets. A chemical solution is pre-sprayed on the carpet, then an extractor is used to inject water into the carpet. The water is then recovered along with soils.

There are several ways to deal with filtration soiling. If this is a recurring problem, cleaning professionals should pay more attention to vacuuming these areas. Because filtration soiling is usually caused by dry soils, these are best removed with a high-performance vacuum cleaner. However, if the problem persists even with more frequent vacuuming, different treatments can be used to effectively clean the problem areas.

Ultimately, the best way to deal with filtration soiling is to prevent it from happening in the first place. According to the Carpet and Rug Institute and other sources, some of the ways to do this include the following:

- Apply stain-resistance treatments to the problem areas; be sure the carpet is thoroughly cleaned before applying these treatments.
- Check HVAC filters. Often when this problem develops, building managers discover that HVAC filters need to be cleaned or replaced.
- Seal the bottoms of doors so that there is less air movement underneath.
- In problem areas, install matting in indoor walkways to help remove soils from shoe bottoms and prevent dust and soils from becoming airborne.

### Soiled walkways

A common and often unsightly problem is pathway soiling, which frequently occurs in long, busy walkways. Pathway soiling is when the center areas of a carpet become dark and soiled, while the outer areas remain clean, often looking brand new. To make matters worse, over time the center areas can begin to show excessive wear and tear, requiring the carpets to be replaced in a relatively short period of time.

As with filtration soiling, the most effective way to eradicate pathway soiling is with frequent vacuuming. Pathway soiling is usually caused by dry soils, which is what vacuum cleaners are designed to remove. Should any spots develop in the pathways, they should be treated and removed as quickly as possible. This helps prevent contaminants in the spot from spreading to other carpeted areas and from staining the carpet. (In most cases, a carpet spot can be removed; a stain is more difficult to eliminate.)

Another option that is often used is to install matting systems where pathway soiling is a

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## THE MOST EFFECTIVE WAY TO ERADICATE PATHWAY SOILING IS WITH FREQUENT VACUUMING.

frequent problem. Purchasing more costly matting is not necessary. A less costly matting service that installs, removes and then reinstalls clean mats on a regular basis could be a wise investment. However, if mats are not installed and pathway soiling is a regular problem, it is important to clean the carpets frequently.

Using an interim cleaning method, such as bonnet cleaning or encapsulation, can help, but these are “quick-clean” carpet cleaning methods. Further, while it is less of a problem today than it once was, some chemicals used for both bonnet cleaning and encapsulation can actually attract soils, causing resoiling, which must be avoided.

A more effective option is to clean the carpets thoroughly using the extraction method. This is especially important in those areas susceptible to pathway soiling, because the soils are repeatedly pounded deep into carpet fibers by foot traffic. Only an extractor can thoroughly remove these soils. Extraction also helps keep soils from damaging the carpets and causing premature wear and tear.

### Carpet potholes

Experienced facility managers have seen this hundreds of times. A tenant moves out, and potholes, more commonly called dents, are imprinted in the carpet where the legs of desks and other furniture once sat. This is not a pleasing appearance for a new prospective tenant to see, but if the carpet is relatively new, building owners and managers may be hesitant to replace the carpet due to costs.

Fortunately, there are some solutions. The first and one of the most effective ways to remove dents is to thoroughly vacuum the carpets and then clean them using the extraction method. This is followed by raking the carpets using a carpet rake. These methods are designed to thoroughly clean and pull up the carpet pile, removing the dents.

If there are only a few dents, another option is to use a coin to pull the pile up at each dent or place a damp towel over problem areas and then run an iron over the towel. A third — and possibly the best — option is to simply give the carpet time. Vacuum (a few times) and extract the carpets as usual, and then see if time heals. Often the problem will disappear on its own.

### Not reading the warranty

This might come as a surprise, but one of the best tips for success is to read the carpet warranty. Frequently, carpet warranties are read only after a problem has surfaced, and in most cases as far as protecting the warranty, that might be too late.

For instance, many manufacturers now require that their carpets be cleaned only with hot-water carpet extractors or the warranty will be deemed void. Hot-water extraction is recognized as the most effective way to deep clean carpets, which is most likely why manufacturers require this as part of their warranties.

Further, a study by Airmid Healthgroup released in January 2014, found that hot-water extraction can also keep facilities healthier.

“What [this study has] shown is that the hot water-based extraction cleaning process is very effective at reducing levels of harmful bio-contaminants,” says Dr. Bruce Mitchell, CEO, Airmid Healthgroup. “To maintain the healthiest environment for occupants, we recommend hot water extraction cleaning two to three times per year and vacuuming at regular intervals.”

### Final thoughts

Facility managers already know that carpeting can be one of their most expensive investments, but it can also be one of the best and healthiest. The Carpet and Rug Institute reports that carpet can be less costly to purchase and, over time, less costly to maintain than hard-surface floors.

However, problems can and do arise with carpets, and some of them can be tough to correct. While managers and cleaning professionals may already be aware of effective cleaning methods for the common problems they are likely to encounter, they must be prepared to deal with some of the more unusual ones as well. Managers armed with this knowledge are better able to keep carpets, as well as the entire facility, healthy and looking their best. **FMJ**



**Joe Versluis** is national sales manager for U.S. Products, manufacturers of portable hot-water carpet extractors. He can be reached via his company website at [www.usproducts.com](http://www.usproducts.com).



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**COMPANY NAME** Cambridge Sound Management

**EXPERTISE** Acoustics/sound masking

**CSP LEVEL** Silver **CSP SINCE** 2014

**WEBSITE** [www.csmqt.com](http://www.csmqt.com)

**FMJ:** *With the growth of open office environments, how has sound masking gained credibility?*

**CAMBRIDGE:** We are seeing companies quickly realize that the introduction of more open floor plans and collaborative work spaces — along with an increased use in reflective surfaces like glass, steel and concrete — can have a negative impact on the acoustics in their office. This directly affects employees' level of comfort, satisfaction and productivity. For this reason, our sound masking

solutions are now trusted by more than 40 percent of Fortune 100 businesses, and a good portion of our business is retrofits into existing spaces. Facility managers just don't have the budget for more construction after the building is occupied; therefore direct-field sound masking has gained significant credibility as a cost-effective strategy to reduce noise distractions and increase speech privacy, without expensive construction or tearing apart the plenum.

**FMJ:** *How much does noise affect productivity?*

**CAMBRIDGE:** Noise, and specifically noise caused by human speech, has a big impact on productivity.

In 2008, Dr. Valtteri Hongisto and Dr. Annu Haapakangas presented the results from their acoustic environment and work performance survey during the IC BEN conference. The survey included 689

employees from 11 companies ranging from customer service call centers to general open offices. Forty-eight percent of participants reported speech as the most disturbing source of noise. In addition, the survey found that employees on average wasted 21.5 minutes per day due to conversational distractions, making speech the number one cause of reduced productivity. Furthermore, this 5 percent of lost time each day can equate to significant financial losses in wasted productivity for companies each year.

Sound masking systems reduce the intelligibility of speech, making it less of a distraction while increasing speech privacy. Additionally, in hospital facilities, sound masking can help patients sleep better at night, which can have a positive impact on HCAHPS scores. A productive patient is one that heals safely and quickly, and rest and relaxation are key to a healthy recovery.



**COMPANY NAME** Consortium for Building Energy Innovation (CBEI – formerly Energy Efficient Buildings Hub)

**EXPERTISE** Energy solutions and management

**CSP LEVEL** Silver

**CSP SINCE** 2013

**WEBSITE** [cbei.psu.edu/index.html](http://cbei.psu.edu/index.html)

**FMJ:** *What is an advanced energy retrofit and what is CBEI's involvement?*

**CBEI:** An advanced energy retrofit is a building- and systems-based renovation of an existing structure focused on the energy savings potential of proposed retrofit activities. CBEI is developing four scales of integrated design roadmaps with the goal of guiding building owners, their professionals and consultants in achieving the highest level of energy efficiency.

The organizational logic of the integrated design advanced energy retrofit roadmaps suite can best be described as a three-tiered structure, with each tier expanding upon and reinforcing the concepts engaged by the previous. Information in the roadmaps is presented in this way to empower the building owner with the knowledge to make a well-informed decision for their project, based upon their particular circumstances. The sequencing of the roadmaps begins with a brief overview, followed by a process explanation and ends with a project team guide.

Download our retrofit roadmap overview here: <http://bit.ly/retrofitcbei>.

**FMJ:** *How does CBEI provide guidance in implementing benchmarking?*

**CBEI:** We worked closely with the City of Philadelphia as a technical advisor for the Benchmarking and Disclosure

ordinance. The law requires all owners of commercial buildings with more than 50,000 square feet of floor space to report on their annual energy (all fuel types) and water use.

Now, representatives from CBEI, the city and PECO (the local electric utility) work together to present their process in webinars, at conferences and in publications to help other cities and municipalities that are implementing similar ordinances.

CBEI is providing data analysis for the Philadelphia's benchmarked portfolio, to identify trends and data quality issues. Also, the EEB Network, powered by Honest Buildings, features profiles and energy information for the city's buildings.

More information can be found at <http://bit.ly/benchmarkcbei>.

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## RLE Technologies

**COMPANY NAME** RLE Technologies

**EXPERTISE** Water technology

**CSP LEVEL** Silver **CSP SINCE** 2014

**WEBSITE** rletech.com

**FMJ:** *What are some recommendations for a highly sensitive facility protecting itself from environmental threats?*

**RLE:** We really look at it as a four-step process:

- Recognize the risk. Some facilities can suffer costs as high as US\$8,000 per hour when they go down, and according to some surveys, nearly a third of facilities will experience a water-related downtime incident within two years.
- Get to know your facility. Identify threats and their sources.

- Encapsulate the areas of concern.
- Determine the best solution for your facility based on the evaluation findings.

**FMJ:** *In developing risk management needs, why choose a conductive fluid sensing cable?*

**RLE:** The problem with fluid leaks beyond their destructive capabilities is that you never know where or when they are going to happen. There are so many sources of potential water intrusion into a facility including cooling units, sprinkler systems, water piping, clogged drains, storage tanks and freezing pipes — the list goes on and on.

To rely on technology that revolves solely around spot detectors is to assume you know the exact location a leak is going to take place. RLE has seen countless examples of leaks that happen near a spot detector and due to even

small fluctuations in the floor grade or just plain bad luck, the water flows right around the detector and spreads to other locations to cause damage. By placing fluid-sensing cable around the perimeter of a room, wire tying it to the bottom of overhead piping and/or serpentine it under a raised floor just to name a few examples, you much more completely protect your facility no matter where or when fluids threaten critical assets.

RLE's fluid-sensing cable and several of our controllers also have the ability to accept a map of your facility and where our sensing cable is located. Subsequently, if a leak is detected the system will almost instantly tell you where the leak is taking place to within just a few inches. This enables you to react quickly to the treat and avoid damage.



**COMPANY NAME** Sika Sarnafil, Inc.

**EXPERTISE** Roofing

**CSP LEVEL** Silver

**CSP SINCE** 2006

**WEBSITE** usa.sarnafil.sika.com

**FMJ:** *How is Sika Sarnafil redefining sustainability?*

**SIKA:** The essence of our philosophy is captured in our slogan, "Performance that Pays. Sustainability that's Smart." Our goal is to help building owners achieve their sustainability goals by providing products, systems and solutions that deliver a return on investment, and to do it in a smart way.

Sustainability should be measured through life cycle analysis versus single-attribute decisions. This helps to save building

owners and operators money and delivers sustainability that's economically sustainable.

Sika has developed a set of 11 criteria that building owners should consider to ensure an apples-to-apples comparison — not only of the products and how they are produced and perform, but of the companies that produce them. Readers can find this list at [www.sustainabilitythatpays.com](http://www.sustainabilitythatpays.com).

**FMJ:** *What factors should be considered when in choosing the right roofing solution?*

**SIKA:** First, establish a budget and expectation for the performance of the roof. Small budgets and short time horizons have very different roofing options than if the building will be occupied for an extended period and is expected to have minimal maintenance issues.

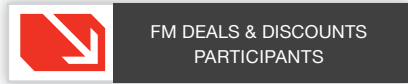
Communicate expectations to the manufacturer and ask for their professional

opinion about your options. Warranties are a component of the decision-making process, but length of warranty is not the most important criterion. Ask about exclusions such as ponding water, gale-force winds and prorated cost sharing. The best warranties do not have these exclusions. A proven track record is important. Is the product produced at the minimum requirements of the ASTM industry standard or is it a higher-quality product that outperforms the standard?

Membrane thickness is very important. All membranes oxidize in the extremes of outdoor exposure and become thinner over time. Is there a guarantee that the actual thickness of the membrane meets the labeled thickness or is it produced to the ASTM required minimum of 10 percent less than the advertised thickness? Ask for a list of projects that have been in place for the amount time that you would expect your roof to last. Ask for references and talk to those building owners.



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Five Ways  
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Better

*Learning*  
**TO** *Listen*  
*Creates*



# Better *Managers*

BY BRADY MICK

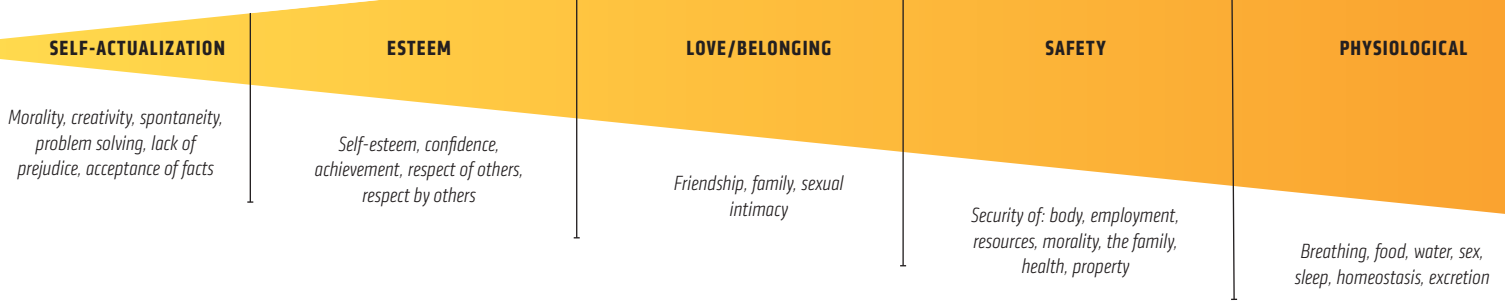
**C**ommunication is an art form and a complex one at that. Whether talking with a customer, family member or a colleague, communication among people boils down to three basic forms: telling, questioning and listening. Of these three, the most important skill for managers to acquire, develop and practice is listening. By understanding the invisible theoretical framework that underlies communication, managers can learn to become better listeners and adopt practices in their work behaviors that lead to more successful communication and fewer breakdowns.

## Communication breakdowns

There are several kinds of communication breakdowns that can cause negative, harmful and adversarial interactions among people. These include:

- **Societal**, such as wars, genocides and extinctions;
- **Communal**, including issues like inequality, class systems and economic strife;
- **Social**, such as bullying, prejudice and hate crimes;
- **Physical**, examples of which include violence, abuse and environmental damage;
- **Psychological**, such as mental illnesses and intellectual and emotional problems and

FIGURE 1



- **Work**, including issues like engagement deficiency, productivity loss and job changes.

In the workplace, it's important to understand the nature of these breakdowns because with knowledge, managers can gain insight into their employees' communication limitations. In other words, sometimes there are breakdowns in communication styles. For example, communicators struggling to express themselves through body language or facial expressions could be misinterpreted as aggressive. There can also be breakdowns in thinking, such as when something intended as a suggestion is misinterpreted as a directive. Additionally, sometimes there are breakdowns in emotional intent, such as when what is interpreted as a tone of anger is really coming from a feeling of passion. Even more difficult to address are the challenges that come when the communication expressed means different things to different people.

### Maslow's Hierarchy of Needs

Every individual has a unique set of needs and motivations, and these fundamentals impact communication. In 1943, a psychologist named Abraham Maslow presented a groundbreaking paper on the nature of human needs and motivations. Maslow's ideas are often presented as a pyramid, with the most basic needs for wellbeing representing the base of the pyramid, and the top level representing personal fulfillment (see Figure 1). According to Maslow's theory, the most basic needs must be met before an individual will focus on or desire needs

at a higher level. For example, if a person is not meeting his basic needs of food and water, he will not be focused on higher-level needs such as friendship or gaining the respect of others.

In daily practice, wellbeing is interdependent with all levels of needs. However, Maslow's hierarchy of needs helps managers understand communication at a deeper level. It enables them to grasp not just what employees are communicating, but why. Employees may communicate about needs that relate to basic physiology (for example, that they are too hot or cold). Or they may voice concerns about safety by asking for extra lighting in the employee parking lot. If they express a desire to help plan a holiday party or team-building activity, employees are indicating their need for belonging. A desire for more office or work space could indicate a need for esteem or even self-actualization by seeking different kinds of spaces to expand creativity, spontaneity or problem solving. Instead of experiencing these requests as complaints or annoyances, managers can connect them to a basic need and understand that the employee is simply (and probably unknowingly) seeking to fulfill an essential need for their work wellbeing.

### Communication psychology

Another important aspect of human communication that managers need to grasp relates to the forms of human understanding. The Swiss psychiatrist Carl Jung identified four ways humans think, feel and experience things:

- **Sensation.** Humans possess five

senses with which they can engage and measure their external reality. These are the familiar senses of sight, hearing, taste, smell and touch.

- **Thinking.** This is the objective realm of intellect and is expressed as reason or the thought process.
- **Feeling.** Also known as "the language of the heart," feeling is expressed as emotion and focuses on value.
- **Intuition.** This is the "gut feeling." It's rooted in ideals of belief, truth, trust and possibility.

According to the theory, a well-rounded person operates in a combination of all four personality functions or types. However, no one develops all four functions equally. Every individual has one dominant type and at least one lesser-developed, or unconscious, type. By understanding how people experience their communication engagement, managers can recognize how employees perceive information and make decisions. For example, intuitive types may not have the same linear, organized and detailed work style as those employees with a stronger thinking type. The intuitive employee is more likely to "investigate" when speaking and approaches problems and projects from multiple angles. A logical, lineal thinker may become frustrated with such communication.

### Communication styles

The third theoretical framework for managers to consider is styles of communication. These include:

- **Words.** As the most commonly understood form of



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It is  
important for  
managers  
to listen  
before telling  
in order to  
communicate  
with team  
members and  
understand  
their  
insights.

communication, words have evolved into complex forms, both written and spoken.

- **Gestures.** Equal in importance to words, gestures have had equal study in communications between humans, as well as extending into the animal kingdom.
- **Expressions.** The nonverbal transference process in communication, expressions are dependent on the sensory form of understanding.
- **Intonation.** A deeper, more subtle and powerful expression of communication, intonation is based on the sound quality and intensity of words and gestures.
- **Introspective.** Autonomy is the venue of the highest forms of communication and becomes the “meaning” of the individual’s unconscious. It is the realm of the artist, the poet, the designer, the scientist and the philosopher.

Managers need to understand that every communication style is unique. Understanding the influence of the styles depends upon situation and often takes great effort. For example, a manager may hear the words of an employee expressing concerns over a complex work problem to be solved. If the manager’s expressions communicate primarily caring and consoling, this may erode the motivation and frustrate the employee. Why? The employee may have been trying to communicate his or her introspective struggle in a search for help instead of consultation. The misalignment was likely in the misinterpretation of the employee’s intonation.

#### Why breakdowns happen

The practical application of studying communication among people at work involves acknowledging the complexity of the conditions surrounding communication. First, what is the hierarchical purpose of the communication? Does it express a need, want, desire, goal, aspiration or any combination of these? Second, how is the understanding of the communication intended to travel from one person to another: is the delivery sensory, intellectual, emotive or intuitive (or a combination thereof), and through what function(s) is it absorbed? Third, what form of communication is used? Is the form word-based, physically gestured, symbolically expressed, emotively intoned, actualized via artistic extremes or some combination of forms?

#### Day-to-day tactics

Communication tactics can be learned. As managers answer the questions above, they can apply day-to-day practices focused around listening to increase

the efficiency, effectiveness and experience of their communication with employees, peers, superiors and even clients. The following are six key behaviors that managers can practice to improve listening skills:

- **Expand expectations for solving business problems.** Because it’s clear that communication is a very complex process, and not the straightforward, cut-and-dried activity often expected, the approach needs to change. Understand that some problems or situations will now take longer to resolve because certain types of communication have to take place as the complexity of business problems impacts people.
- **Don’t be an order taker/giver.** It is important for managers to listen before telling in order to communicate with team members and understand their insights. Most companies want engaged people, not servants. When a client says “Give me this on this date,” and a better solution is apparent, managers shouldn’t hesitate to consider ideas that make the problem easier to define and solutions of higher quality.
- **Think creatively.** Creative thinking requires the suspension of directive questioning and thrives when inquisitive questioning is followed by intensive listening. Managers who expand their thinking and do not rely solely on solutions of the past produce better results. With increased listening skills, it becomes possible to connect to an employee’s desire for esteem and self-actualization and achieve new and innovative business results.
- **Be curious.** Good managers ask questions that avoid a “yes or no” response. They seek stories first and, above all, seek to understand the meaning of the employee. When managers first seek to understand the meaning of the communication from an employee or customer, they will be better positioned to fill the need.
- **Become proactive.** Managers need to reverse the fire-drill model of communication. Instead of waiting for a frantic business problem or for a deadline with nowhere to turn, proactively check in with teammates periodically and listen to the insights and ideas.
- **Redefine value.** The value of communication is complex and requires time and commitment to attain high value and performance. Develop and use a higher quality of communication that is listening-based. Use all forms of communication consciously and often. Good communication takes time.

## Implications for design

Often the space in which we work is limited in its ability to facilitate all forms of communication. While it's ideal that workspaces are built with the vitality of listening-based communication in mind, there are ways to adapt spaces to meet the desired behaviors of listening. For example, reposition closed doors — not just physically, but metaphorically as well. While open doors can facilitate day-to-day communication, a closed door can meet an employee's need for safety if they have a serious problem to discuss with a manager.

While it may not be possible to change the physical structure of the workplace, managers can create spaces that facilitate listening. Whatever form these take — conference rooms, alcoves in a cafeteria or even a room dedicated to teleconferences and webinar viewing — find spaces that allow an individual or group to listen with focus and intent to the communication of others.

Workplaces that create spaces that address Maslow's hierarchy of needs have a distinct advantage. Even the bottom level of needs — food, air and water — can be addressed with an inviting community room. If people are communicating a desire for greater self-actualization in their work, seek white boards or shared screens to display ideas and encourage higher forms of communication.

## Listen first to avoid communication breakdowns

How powerful is listening as a form of communication? The answer: so powerful it's considered a tool in the fight against mental illness. A problem that many people experience today is anxiety disorders. When sufferers of chronic anxiety have a panic attack, their ability to listen and reason shuts down. Parents, spouses, coworkers or managers, wishing to help the victim through their struggles, may instinctively start telling the victim what to do. For example, they may say things like "Just calm down," or other well-intended but ultimately harmful admonitions.

Alternatively, in a struggle to understand the victim's condition, their instinct may be to ask him or her too many questions: "Why are you so upset?" "What's wrong?" "Don't you see you're being silly?" What doctors have learned is that sufferers of anxiety disorders recover more quickly when friends, family and coworkers close their mouths and open their ears.

The Anxiety and Depression Association of America list several ways to help anxiety sufferers on their website ([www.adaa.org](http://www.adaa.org)) that drive home the point of listening. For example, their advice for parents of college-aged anxiety sufferers includes, "Be an active listener. Lend an open ear when your child is feeling stressed or overwhelmed. Listen to what he or she says, as well as to what isn't said. (Is there any mention of friends or social activities?) Respect his or her feelings even if you don't fully understand. This will encourage your child to start talking, which can serve as a source of comfort when feeling overwhelmed."

## Say less, listen more

If simply listening can be a powerful tool to aid those with mental

illness, what can it do in an office environment in which the goal is simply to communicate well? Unfortunately, most management is built on telling, and in some cases the process of inquiry, i.e., to question. But where many fall short is in the area of listening. When professionals aren't skilled listeners, the result is a breakdown in communication, resulting in a workplace that falls short of achieving the richness of results for people and their companies. **FMJ**



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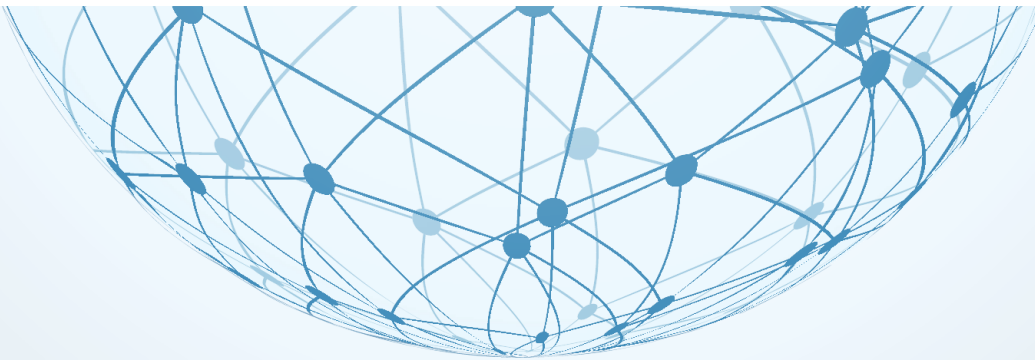
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**FACILITY REALITIES:**



# **CFM AS AN INEVITABLE TREND**



**BY TOM WILLIE**

**A**ll over the world, the facility management profession continues to mature and evolve. For instance, the facility managers of today are expected to understand their company's core business and contribute to the bottom line. This can translate not only to reducing facility costs, but also to improving the productivity, revenue generating capacity and image of their organizations.

Facility management of large or multi-site geographically distributed business enterprises such as complex hospital systems, universities, military institutions and manufacturing sites

is increasingly turning toward the corporate centralization of facilities management and operations. The aim is to address the increasing challenges of economically and reliably orchestrating core facility-based operations.

Facility managers play a critical role in business continuity after a disrupting event, not only by devising and implementing the prepared response plan, but also by serving as role models for the organization in emergency preparedness and business continuity planning.

There is a paradigm shift that we are seeing today that quite often involves individual on-site facilities managers

about 20 years. Most of the core electrical equipment inside these facilities was often installed just shortly after they were built. This is further complicated by the fact that an average facility can have dozens upon dozens of disparate vendors and varying equipment.

Even asking for help can require significant effort because there is little collaboration and too often once equipment is purchased and installed, vendor involvement ceases. We have heard from countless facility managers the woes of having a multitude of disparate equipment that has been designed in a way that doesn't allow for any communication and

availability of the aging phone company workforce. The same basic challenges that are facing core facilities systems today have been seen before and are being addressed through new technologies and new operating approaches.

Of course, opportunities do exist to pay for some of these technology needs such as by taking advantage of demand response revenue and/or energy-efficiency programs to offset costs. Unfortunately, too often the time and expertise required to enroll in and implement these programs is in scarce supply in an already stretched local facility workforce. Inevitably local onsite facilities managers find themselves



## More than **50 PERCENT** of facilities management personnel will retire in the **NEXT 10 YEARS.**



combating ever-increasing budget pressures to address a near-perfect storm of operating challenges. Energy prices are growing while the reliability of supply is declining. There are 15 percent more power outages today than there were 10 years ago. Such outages cost the economy more than US\$125 billion per year — and that is increasing annually.

The core electrical and mechanical infrastructure within the facility is aging and the workforce responsible for overseeing this critical equipment is aging along with it. In fact, according to the Sloan Center on Aging and Work, it is expected that more than 50 percent of facilities management personnel will retire in the next 10 years. The Standard and Poor's Index further highlights that the average age of U.S. hospitals is more than 27 years and of military bases is

integration among separate pieces. Instead these become mini-silos of equipment that end up needing to be manually managed.

Make no mistake; age-based challenges are nothing new within the greater marketplace. Billions of dollars have been spent by power utilities on smart grid technologies to fundamentally address the same aging infrastructure concerns. The linemen set up to protect our power grids do their best with depreciating assets.

It is a similar scenario to what we have already seen with the telecom industry. Billions of dollars were spent by telephone companies to deploy technologies that would replace aging telecommunications networks while ensuring these new networks would not rely on the long-term

balancing the opportunities to implement money-generating programs with challenges as rudimentary as replacing a roof. Time and budget simply will not allow them to do both effectively. Something has to give.

The challenges encountered within critical facilities such as data centers, universities, military bases and hospitals are not as simple as a few lights going off from time to time. They can lead to major losses of revenue, critical research efforts, security and even lives. The impact of failing to maintain the status quo is profound. It can ruin a company overnight and mar an enterprise's good name or reputation.

Take these challenges up a level into complex multi-site, multi-building, remote and geographically dispersed operating

enterprises. The executives and leaders of large hospital systems, expanding universities, nationwide data centers and worldwide military bases are exponentially confounded by the daunting challenges of managing their core facility operations.

The pressures to do more with less continue to mount. This is an old cliché, but more true today than ever before. Increasingly, leaders of these complex organizations are rapidly considering a migration to centralized facility management (CFM) as the solution to their operating concerns because it gives them better insight and a platform that better equips them to make the right decisions for their organization.

system network. The ability to absorb those hospitals and effectively manage them is going to become increasingly difficult. The streamlined necessity to onboard these new facilities with fewer people and smaller budgets is inevitable. After all, the main reason for the acquisition is the age-old economies of scale argument.

Colleges and universities have similar issues to the health care industry. There is a lot of money being spent to retrofit universities in order to keep their infrastructure operating and competitive. According to the CP&M 2012 Annual College Construction Report, it is expected that colleges and

enormous pressure to meet enhanced efficiency targets to cope with escalating energy prices and the threat of increased power outages. Facility managers running the data centers live and breathe to circumvent crippling facility operational issues.

### Implementation path of CFM

In order to address these general and industry-specific multi-site/multi-building facility challenges, FM organizations and C-suite executives are turning more toward centralizing the financial, technical and operational aspects of running these complex facilities. In most cases the migration to CFM involves a step-by-step



Once the **TECHNICAL PLATFORM FOR CENTRALIZATION** is in place, corporate facilities directors can **CENTRALIZE OPERATIONAL OVERSIGHT AND MANAGEMENT** across the facility network.

### Industry-specific trends supporting rapid migration to CFM

In addition to these general facilities challenges, industry-specific issues are further driving C-suite executives toward CFM. For example, in the health care industry, it is all about aggregation and consolidation. In the health care industry alone, there have been more than 550 U.S. hospitals acquired by larger hospital systems since 2007. More than 20 percent of today's independent or smaller hospital systems are expected to be acquired within the next five years. The range and scope of hospital mergers are far reaching.

Hospital systems are dominating the landscape of healthcare in the U.S. — nearly 30 percent of all U.S. hospitals are owned by 44 hospital systems, with an average of almost 40 hospitals per health

universities will spend more than US\$9B on retrofitting their existing facilities, with the majority being spent on core mechanical and electrical upgrades. Budget cuts and staff reductions are bad enough under any circumstances, but when combined with the ever-increasing operating demands faced in educational settings, doing more with less in managing a university infrastructure becomes more difficult than ever before.

Data centers have some of the most challenging facility issues because they are primarily driven by the complexity they present in and of themselves and the fundamental revenue loss impact if they fail, let alone irreversible reputational harm. As the world becomes more IT dependent, the performance of data centers and smaller data hubs is crucial, with data center managers under

implementation and consolidation approach around critical functional areas where the speed of the migration is governed by the degree of challenges facing the enterprise. This “common” path to CFM implementation is shown in Figure 1.

The starting point of almost all centralized facility management migrations requires the financial side of the organization to buy in. Complex organizations across numerous industries are already obtaining the approval of facilities-related capital spending from the corporate level and eliminating this budget decision from local sites. This allows for true enterprise-wide capital prioritization based on critical need and not purely local value. Capital allocation is often closely followed by centralized procurement and vendor contracting.



1

FINANCIAL

- Budgeting and capital allocation
- Purchasing



2

TECHNICAL

- Visualization and monitoring
- Platform standardization
- Joint commission control
- Demand response enrollment/control



3

OPERATIONAL

- Scorecarding and best practices
- Facility "onboarding"
- Central facilities workforce



4

VIRTUAL

- Remote facilities management
- Automated load shaping
- Automated genset dispatch

Shortly after or in conjunction with financial centralization comes the implementation of a foundationally secure, vendor neutral and highly scalable visualization, monitoring and control software-based platform where the control capability is often used in hospitals for joint commission testing centralization and in all industries as an enabler of demand-response capabilities. Facilities systems integrated within this platform include anything within the local facility that consumes electricity, such as HVAC and lighting systems, to things that produce electricity, such as generators and on-site distributed generation, to things that switch and meter electricity within the facility.

The selection of a vendor-neutral software platform is one of the most fundamentally important undertakings for an organization as the traditional facility space is littered with vendor-specific, "only-use-it-with-my-hardware," systems. Or worse, with stick-built, highly customized legacy SCADA approaches, which are highly susceptible to security issues (including cyber), do not scale to multiple facilities and can cost millions of dollars in customization.

Once the technical platform for centralization is in place, corporate facilities directors can begin using added analytics to centralize operational oversight and management within each facility and across the network. This takes many shapes including the use of best practice/worst practice scorecarding for capital prioritization to greatly simplifying the integration of any newly constructed or acquired facility, to complete centralization of facilities management reporting with the potential for central dispatch and a more mobile facilities workforce. What once was done repeatedly with a crew, truck and clipboard at multiple locations can now be done with a push of a button from a single location or even a mobile device.

Lastly, facilities are migrating or virtualizing certain aspects of energy consumption, generation resource utilization including automatically modifying load behaviors based on economic "what-if" analyses or automatically pre-starting the process to move to island mode when a utility has notified the facility about a potential loss of power. Additionally, highly innovative enterprises are considering using virtual remote facilities management to monitor and control the systems within their smaller and highly rural facilities from hundreds of miles away — leaving nothing but maintenance to the local site.

**Benefits of CFM**

Facilities operators who have begun to implement centralized facility management are already seeing a plethora of benefits that were simply impossible to achieve with local decision-making. These benefits include:

- Facility infrastructure focused capital allocation assurance
- Aging workforce mitigation and protection
- Simplified onboarding of new acquisitions or new construction projects
- Wasteful capital spending avoidance driven by vendor-neutral purchasing, purpose-built purchasing and silo system elimination
- Operational cost reductions via elimination of outside contracted services
- Workforce efficiency gains allowing for better utilization of local personnel on critical local concerns
- Enterprise policy and assurance of attainment on energy efficiency and demand-response opportunities
- Standardization of best practices across facilities and detection of worst practices
- Joint commissioning automation

with healthcare organizations and related compliance requirements across industries

- Fleet and asset management including the ability to move capital assets such as generators around within the system of facilities when upgrades may be required.

**Call for centralization**

Fundamentally, the challenges facing facilities operators today are simply too great to allow for the continuation of age-old practices with the hope to survive. Industries such as telecommunication and power have proven that changing the approach both technically and operationally is essential to succeeding. Centralizing facilities management control while maintaining and improving local facility operational capability is no longer a consideration, it is a rapidly expanding trend with growing proof points of real-world implementations across a variety of industries. **FMJ**

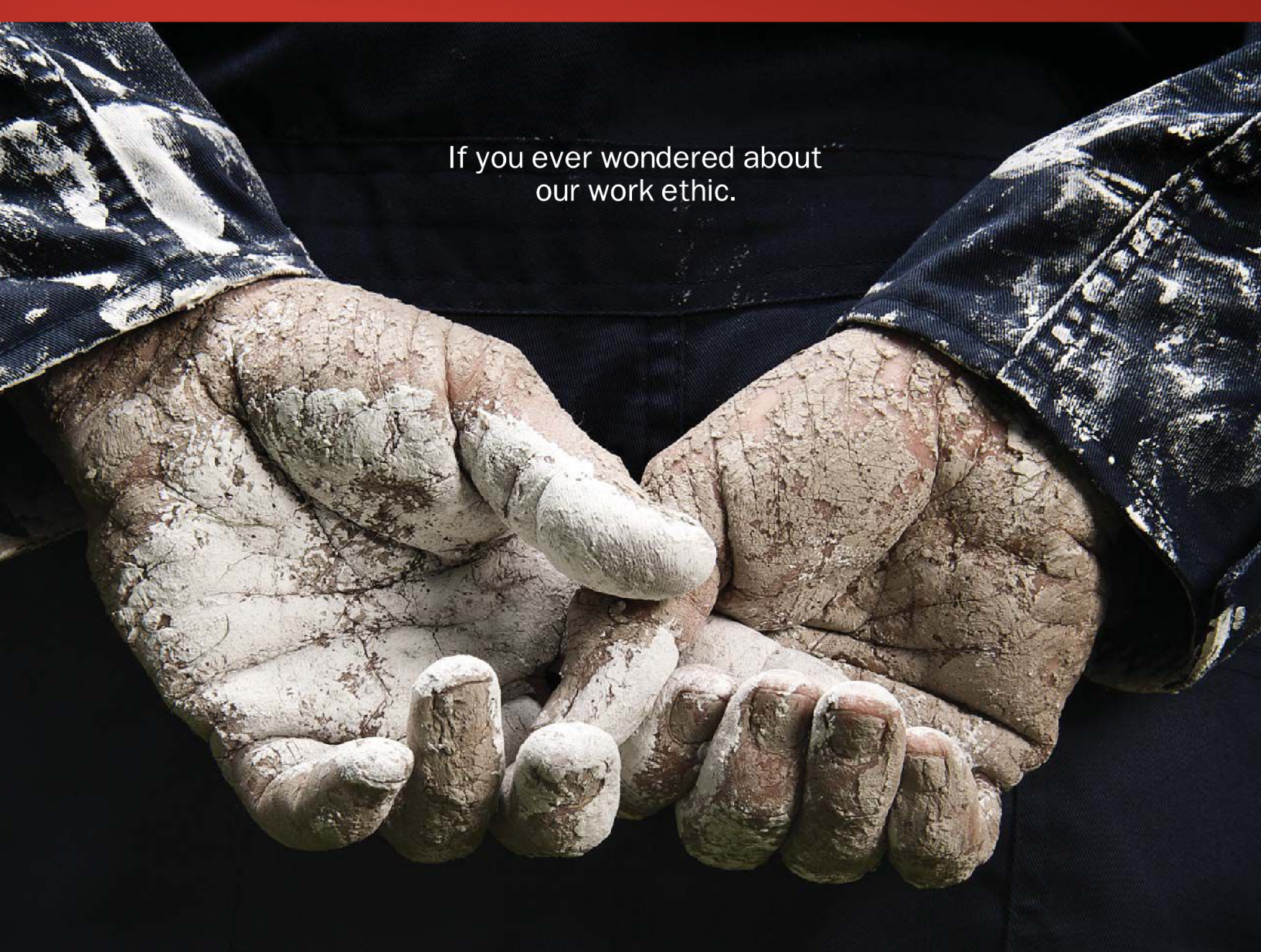


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Pillar, including a proven executive management track record.

Willie was most recently CEO of Current Group, serving as Current's chief product officer and chief operating officer since December 2003. He was also vice president/vice chairman of PRIME Alliance AISBL, a nonprofit industry trade group focused on the development of a new open, public and non-proprietary smart metering and smart grid communications solution.

Prior to joining Current, Willie served as vice president and general manager of Siemens/Efficient Networks and held strategic worldwide marketing management positions at Texas Instruments and National Semiconductor. Willie obtained his Bachelor of Science in electrical engineering from Purdue University.



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Lynn Haven, Fla.

**Ronald Chase, CFM**  
L-3 Communications Corp.  
San Carlos, Calif.

**David Davis, CFM**  
Fairfax County Government  
Manassas, Va.

**Cliff Cone, CFM**  
Transwestern  
Highland Village, Texas

**Lynn Baez, CFM**  
Dr. Pepper Snapple Group Inc.  
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**Glenn Larson, CFM**  
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**Gregory Wood, SFP**  
Washington County  
Stacy, Minn.

**Chris Brodnicki, SFP**  
Federal Home Loan Bank of Indianapolis  
Danville, Ind.

**Theresa Raymond, SFP**  
JLL  
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**David Von Mosch, SFP**  
Lewis Energy Group  
Mico, Texas

**Richard Darby, SFP**  
Metro  
Irvine, Calif.

**Merita Pleasant, SFP**  
Peoria, Ariz.

**David Ellsworth, SFP**  
Chesapeake Energy Arena & Cox Convention Center  
Oklahoma City, Okla.

**Bruce Ruoff, SFP**  
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Arlington, Tenn.

**Jerome Ingrande, SFP**  
Thomson Reuters  
Spring Valley, Calif.

**Shawn Emmons, SFP**  
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**Woodrow Mills, SFP**  
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**James Musselman, FMP**  
Kaiser Permanente  
Ashburn, Va.

**William Randall, FMP**  
The Compass Church  
Naperville, Ill.

**Daniel Arroyo, FMP**  
Hoboken University Medical Center  
Airmont, N.Y.

**Frank Skinner, FMP**  
WorkSafeBC  
Surrey, BC, Canada

**Stephen Story, FMP**  
Bethel School District  
Roy, Wash.

**Christopher Franchi, FMP**  
General Electric  
West Sand Lake, N.Y.

**Muhammad Tuskheer Sohail Abid, FMP**  
EMCOR Saudi Arabia  
Karachi, Pakistan

**Mike Burt, FMP**  
Sodexo  
Baytona, NL, Canada

**Paula Neuschatz, FMP**  
SAP America Inc.  
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**Jaehyung Park, FMP**  
Serveone  
Seoul, South Korea

**Tony Barendsen, FMP**  
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**Russell Mayfield, FMP**  
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**Ann Simpson, FMP**  
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**Matthew Sappington, FMP**  
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**Bill Rogers, FMP**  
Blue Coat Systems Inc.  
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**Thomas Shell, FMP**  
Department of Corrections  
Blackstone, Va.

**Robert Ripberger, FMP**  
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**David Nicholas, FMP**  
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Dignity Health  
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**Denis Ryan, FMP**  
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**Tony Tierney, FMP**  
Questar Assessment Inc.  
White Bear Lake, Minn.

**Sandra Papadedes, FMP**  
Sodexo  
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**Juan C. Alicea, FMP**  
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**Joyce Richards, FMP**  
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**Ayoola Soyemi, FMP**  
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**Dean MacKinnon, FMP**  
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**Javier Inclan, FMP**  
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Vancity  
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**Mike Gillespie, FMP**  
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Charles Schwab and Co. Inc.  
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RGM Ltd.  
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**Lisa VanderHeyden, CFM**  
Jefferson County Public Library  
Arvada, Colo.

**Jansel Matos, CFM**  
Fairfax County Government  
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ARAMARK Facility Services  
Washington, Mich.

**Michele Gregg, CFM**  
H&R Block  
Independence, Mo.

**Sean O'Brien, CFM**  
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**Derek Collier, CFM**  
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**William Wright, CFM**  
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**Karen Koury, SFP**  
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Lewis Center, Ohio

**Rashaud Avery, SFP**  
Advanced Resource Technologies Inc.  
Manassas, Va.

**Dan Bess, SFP**  
IGT  
Las Vegas, Nev.

**Barbara Luna, SFP**  
FBG Service Corp.  
Omaha, Neb.

**Kenneth Kaehler, SFP**  
BAE Systems Inc.  
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**Jack Gill, SFP**  
University of Houston  
Stafford, Texas

**Nicholas DeLaura, SFP**  
U.S. Coast Guard  
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**Debra Gutzmer, SFP**  
CBRE  
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**Shervin Ansari, SFP**  
Kiewit Corp.  
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**Craig Whitfield, SFP**  
University of Houston  
Houston, Texas

**Frances Lang, SFP**  
Cenovus Energy Inc.  
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**Douglas Bonney, SFP**  
ABM  
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Eplica Inc.  
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**Ronald Beaton, SFP**  
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**Stephen Brown, SFP**  
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SAP America Inc.  
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**Walt Lowry, FMP**  
Port of Seattle  
Bremerton, Wash.

**Jason Reynolds, FMP**  
USAA PHX Campus  
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**Jeff Zenner, FMP**  
North East School Division  
Melfort, SK, Canada

**Lisa Mess, FMP**  
Freddie Mac  
Woodland Hills, Calif.

**Pedro Narbaitz, FMP**  
Carillion  
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**Scott Latta, FMP**  
City of Coppell  
Coppell, Texas

**Mark Lopez, FMP**  
Johnson Controls  
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**Christine Bowen, FMP**  
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**Jill Hathaway, FMP**  
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**A. Bruce McPherson, FMP**  
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**Chantal Brigaerts, FMP**  
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**Celia Smith, FMP**  
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**Craig Thomas, FMP**  
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Nwokoma Nwankwo & Co.  
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**Christa Dodoo, FMP**  
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**Erik Jalowitz, FMP**  
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Agrace Hospice Care  
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**Rosalyn Kinchelow, FMP**  
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Freddie Mac  
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**Eric Marshall, FMP**  
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**D.J. Parent, FMP**  
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**Muhammad Pervez, FMP**  
U.S Embassy  
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Athabasca Oil Corp.  
Calgary, AB, Canada

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**Myrle Rodgers, FMP**  
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# WORLD FM DAY

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## 4 June 2014

Once again the facilities management industry around the world is getting ready to celebrate World FM Day, by far the most significant date on our global calendar, and on behalf of Global FM, I invite you and your organization to get involved.

To be held on 4 June 2014, the aim of World FM Day is to raise the profile of the FM profession, not just in your local markets, but anywhere FMs influence the health, safety, productivity and well-being of people who utilize the built environment; and that means everywhere.

This year's theme is "Connected FM, Connected World — Global Knowledge Sharing," focusing on how we connect with our own organizations, how we understand our clients and importantly, how we can tailor and share information and learning to grow individual businesses and the profile of the wider industry.

Be it a formal panel seminar, a staff office morning tea or a client networking event, since 2008 World FM Day has provided the catalyst to engage hundreds of individuals, companies, associations and partners in celebrating their

successes and showing the world the important contributions facility management brings to the built environment.

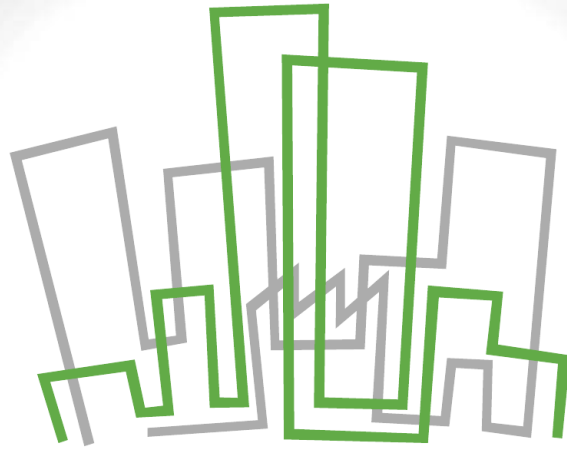
Let us know what you intend to do for World FM Day and we will put it on the Global FM website as both information sharing and as an inspiration to others who are looking for great ways to get involved. Following World FM Day, articles will be prepared for magazines produced by local FM associations, including what you did to recognize this great day.

To let us know what you will do or for more information please email [worldfmday@gmail.com.au](mailto:worldfmday@gmail.com.au) or go to [www.globalfm.org](http://www.globalfm.org). You can also follow @WorldFMDay on Twitter for the latest event updates.

I look forward to hearing about how you will be participating in World FM Day 2014.

Yours sincerely,

Duncan Waddell  
Chairman, Global FM



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BY RENUKA RAJAGOPAL

The scope of facility management in India as an integrated and critical services function is growing rapidly and becoming increasingly competitive. The demand for this is coming from across various industry sectors such as infrastructure, banking, retail, IT, ITES, healthcare, sports facilities, residential, commercial, telecom, insurance, pharmaceuticals, medical care, biotechnology, educational institutions, etc.

Therefore, facility management services are much needed across all organizations. The complex operations model with new technologies in buildings, meeting local compliances, customer expectations for a global operations environment, etc. sets the need for more structured process-oriented services with knowledgeable resources and accountability.

As FM is not a core expertise area for many organizations, strategic outsourcing of facility management operations to established service partners is another trend that has become more prevalent over the past decade. Facility management services, project management, space management, EHS and strategic occupancy services have transitioned to external service providers in many established organizations. This minimizes the effort that organizations are putting into running facilities so that the business functions can strategically focus more on their core work, i.e., products and customer.

Facility management is expected to partner actively in new initiatives, innovate, optimize costs, contribute to the bottom line and add value to the core business of the client organization. Continual improvement, operational excellence, exceeding service levels and customer satisfaction are the basic expectation.

#### FM opportunities and challenges

Rapid growth leads to increased expectation for excellence. Therefore, opportunities and challenges go side by

side. Scope of services, expectations and industry growth create more avenues and opportunities for the experts and growing professionals in every aspect of facility management.

As organizations continue to take large spaces in industrial parks and campuses as well as consolidate business and data center operations, the need for professionally managed facility management services is booming. There is a growing need among organizations for enabling the latest in smart working offices, technology, cost optimization, energy savings, food and reception services, janitorial, property and risk management, financial management, business continuity plans and employee transportation services.

To be the best, organizations need to track occupancy cost data, create utilization reports, contribute to community and manage statutory and EHS compliance. This is becoming more and more specialized, regardless of industry segment, and provides ample opportunities across the industry for leaders, middle management, executives, budding professionals, service partners, vendors and all associated with facility management to learn and grow.

The main challenges in a growing environment emerge from the rising need to meeting expectations on building up a more organized and sustainable services function. While the industry has grown in leaps and bounds (20-25 percent growth in some years) offering great opportunities, exposure and ongoing learning, there is still more that needs to be achieved. This would mean more structured development of organized services, resources, building skills in soft services, engineering, health and safety to running day-to-day operations.

To address the need for continual improvement and excellence, many organizations are moving toward a sustainable outsourced model with



## *There is continuing and growing demand for qualified, knowledgeable and well-networked professionals in India.*

specialized service partners. This meets the need for more growth, maturity and professionally managed services, systems, processes and vendor governance. As FM leadership moves to the next level (i.e., from operational to strategic), enhancing the value to business, operations, community and adding to the bottom line of the organization are essential.

Corporate social responsibility, green initiatives and a reduced carbon footprint are gaining importance and becoming a norm to be met by all companies. FMs must engage in ongoing learning, best practices sharing and networking to stay ahead of the game. FM is making a very visible impact in every industry and organization to which it contributes. While most multinational companies have a good global structure, in an Indian environment to achieve quality performance this model needs to be more detailed and customized. FM has to be executed very well locally as the profession is yet to mature.

### View of IFMA in India

IFMA is viewed as an established highly professional and global organization for facility management professionals to connect, network, create value, learn and facilitate information sharing. It is viewed as an association that can create value and help professionals grow in this field. In India IFMA is currently in its initial stages and is viewed as a networking platform to learn more about facility management best practices on operational services, benchmarking, innovation, partnership, leadership, sustainability and thereby enhanced professional networking and development. IFMA is starting to have a strong presence at a very pivotal time. It is working toward creating awareness on the scope this industry offers to its leaders, middle management and all other budding and associated professionals connected with the industry.

IFMA currently has three established chapters in India: Bangalore, Delhi and Mumbai. There are chapters being planned in other cities like Chennai and Hyderabad in the coming months. Due to the rapid pace at which the market is growing, there is good awareness among facility professionals about IFMA and its reach and penetration in various segments of industry. Recent IFMA programs in Bangalore and Delhi have created enormous expectation about the work that can be done in knowledge sharing among professionals, training, education, innovation, technology advancement and best practices.

While most facility management professionals start as architects, engineers and administration managers and move into facility operations, we are beginning to see aspiring professionals who are considering this industry as a career option. They connect instantly with IFMA to know more about the field, scope, global market presence and roadmap.

### Increasing value in the Indian FM market

The facility management industry is set to enter its next phase of the market life cycle in India from developing to a more mature stage. There is continuing and growing demand for qualified, knowledgeable and well-networked professionals in India. The aspiring professionals who are joining the field after their education are aware of the specialized verticals within the vast horizon of facility management.

Creating more awareness about IFMA and its programs in the Indian market through regular chapter meetings, workshops, interactive programs, webinars, site visits, etc. would improve the learning, networking and knowledge sharing within the fraternity. It would help build specialized communities within the massive industry which could take the profession to greater heights.

Customers and industry participants are looking for credible, researched-

research-information on industry best practices across the global and Indian industry. IFMA, through its strong global connections and local presence, can contribute significantly in this space in a more strategic way. It can create a stable knowledge sharing and networking platform for both suppliers and clients. It can facilitate creation of value-added partnerships, knowledge-based manpower, training and education, transparency, flexibility and risk mitigation.

Facility management is now widely supported with training and professional qualifications offered through universities, colleges and other institutions, and FM associations across the world. In India as of now there exist a very limited number of formal degree programs at both graduate and post-graduate levels and IFMA can play a very vital role in this area. Mentoring, knowledge sharing, brand building and innovation with the new generation of facility management professionals and aspiring college students would enable facility management to grow in strength. **FMJ**



**Renuka Rajagopal** is Vice President, Global Real Estate and Facility Management, South Asia for Thomson Reuters, the world's leading source of intelligent

information for businesses and professionals. She is a member of the board of Thomson Reuters India Services Pvt. Ltd., an Indian entity of Thomson Reuters. Prior to Thomson Reuters she worked with organizations such as Hewlett Packard and VeriFone.

An architect by profession with more than 20 years of experience, Rajagopal paved her way from mainstream architecture into project management in the IT industry in South Asia and all major aspects of real estate and facility management.

She is also a board member and the president of the International Facility Management Association Bangalore Chapter for the 2014 fiscal year.

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## The Situation

Jay Drew, CFM, SFP, has extensive facility management experience in the museum, real estate, construction—and most recently, legislative—industries. Drew is currently facility project manager for the Connecticut General Assembly in the Office of Legislative Management. He oversees 450,000 square feet of office and assembly space. Because his facilities do require a large amount of energy use, sustainability has become a top priority in recent years; especially now that energy-efficiency is becoming a government requirement.

## The Approach

With Drew's busy work schedule, the flexibility that the Sustainability Facility Professional® program provided was essential. The online materials allowed him the opportunity to study any time a free moment arose—eliminating the need to carry around additional course content. Drew is also an advocate of the instructor-led classes, praising the logical manner in which the material is presented.

Through the SFP program, he gained the sustainability knowledge he needed to advance in his profession.

*“The SFP taught me to look at projects through the eyes of the decision-makers. You've got to prove that sustainability makes sense, not only environmentally, but financially. The SFP program shows you the best way to present your case to the C-suite—from theory, to design, to implementation.”*

## The Results

By earning the SFP, Drew earned credibility both as an individual and as a representative of his organization. Sustainability is one of the most important topics throughout the entire facility industry, and having an SFP on staff proves that the Connecticut General Assembly is serious about aligning their objectives with the triple bottom line.

Drew's company has now undertaken many sustainability initiatives, several of which have qualified for government rebates that have more than covered his expenses for materials.

*“By implementing the sustainable practices I learned about through the SFP program, my company has reduced operating costs by nearly US\$100,000 this year alone. When you have this kind of ROI, it's easy to get project approval.”*

*“Now is a great time for facility managers to shine, because we have the opportunity to make the largest impact in sustainability. The knowledge gained from the SFP program allows you to reduce costs, improve efficiency—and beyond that—create a culture of responsibility in your organization and your profession.”*

**Jay Drew, CFM, SFP**  
Facility Project Manager  
Connecticut General Assembly  
Office of Legislature Management

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# COOLING EFFICIENCY THROUGH ENERGY STORAGE



BY MARK MACCRACKEN

**A**ir conditioning of commercial buildings during summer daytime hours is the single largest contributor to electrical peak demand and the biggest stressor of the power grid and utilities. Ice-based thermal energy storage technology shifts peak electric loads for air-conditioning to off-peak hours. It uses a standard air conditioning chiller to produce solid ice in storage tanks at night during off-peak periods when the building's electrical loads are at a minimum.<sup>1</sup> The next day, during peak times, the ice is melted to cool occupants. This not only significantly reduces energy and peak demand charges, but can also reduce the amount of source fuel consumed.

There is very little difference between an ice storage system and a conventional chiller plant system. In an ice storage system a chiller cools an antifreeze solution at night to store the energy. There are slightly different fluids and a few more controls, but the piping is similar to a conventional chilled water cooling system. Thermal energy storage systems require ice tanks, a diverting valve, a modulating control valve, some added control sequences and a formulated heat transfer fluid. A good ice tank system will have no moving parts and be constructed entirely of non-corroding materials. Today's more advanced ice enhanced chiller plant systems use standard chillers with factory-mounted ice-making controls that can be monitored on an iPad or an android device.

Of course, thermal energy storage is not for everybody, but those who use it save a significant amount of money and can lower their impact on the environment. Building owners may save up to 50 percent of their cooling costs which translates into thousands, even millions of dollars per year, depending on the size of the air-conditioning space and utility costs. The following are some key items to address when considering adding energy storage.

### What buildings are right for energy storage?

**Facility types.** Thermal energy storage works for new construction or major energy-efficiency upgrades. K-12 schools, community colleges and office buildings are perfect applications for energy storage because there is little or no nighttime load and the cooling loads peak during the day when electricity is most

expensive. In the case of a facility that has 24-hour operation, energy storage can minimize the demand penalty associated with operating spaces such as pavilions, ballrooms and meeting rooms. Energy storage can minimize the demand penalty for hospitals have surgical suites and outpatient centers that have daytime-only use.

**CASE STUDY:** A LEED-certified office space, CA Lottery, installed energy storage to provide the main structure as well as pavilion with cooling capacity. Two 200-ton chillers created energy to be stored as ice at night for use the next day during peak demand hours. The pavilion had two air handlers totaling 57.5 tons, as well as 100-kilowatt solar photovoltaic panels. Any energy allocated to the chiller and energy storage tanks for the pavilion was offset by the renewable energy generated by the solar panels, thus the pavilion was classified as net zero.

"The new facility has been able to fit our needs perfectly," said Terry Murphy, CA Lottery's deputy director of operations and their project manager during construction. "The energy storage tanks are not only helping us minimize our utility costs but are a popular feature to tell people about when they visit our headquarters."

**Spikes in energy use.** A building with significant peak energy use is a good candidate for thermal energy storage. Often these are buildings in locations with hot summers and high air conditioning use. Using energy during high demand — i.e. in the middle of a hot afternoon — not only has a higher energy charges (kilowatt-hours), but also can incur demand charges, based on the highest on-peak demand (kilowatts) for electricity.

**Timing.** The best time to implement a thermal energy storage strategy is at the beginning of the HVAC design in new construction projects or while facing the retirement of existing chillers in existing buildings. The usual life expectancy of a chiller is considered to be 20-25 years, but the economic life expectancy can be much less. At that time, chillers can be downsized to reduce mechanical and electrical equipment costs and storage may be added for savings on cooling costs and more cooling system flexibility and resiliency.



Dundalk Institute of Technology image courtesy of BDP & Ross Kavanagh ([www.roskavanagh.com](http://www.roskavanagh.com)).

**CASE STUDY:** In Belleville, Canada, Yardmen Arena's existing chiller system used R-11 chlorofluorocarbon refrigerant, which was banned effective Jan. 1, 2012 according to Ontario regulation 189/94. Due to this refrigerant phase-out regulation, the arena's aging mechanical system needed to be updated. Paying an astonishing CAD\$300,000 in annual energy bills, Yardmen Arena represented the largest energy consumer of all the city's assets. As such, rather than just replacing the old system with an updated version, city officials sought to install an innovative green solution that would not only comply with the new regulation, stay within budget and meet the project deadline, but also significantly lower annual energy expenses.

Peter Lyng, facilities manager, recreation, culture and community services for the City of Belleville, added, "We now

have a chiller that is half the size of the original and operates during off-peak hours because of the ice storage system. Everyone is extremely enthusiastic since the new system was installed. People are looking to us as leaders for green solutions. The city's green task force is ecstatic with the energy savings."

**Space.** Typically, thermal storage systems provide about one third of a building's total cooling requirements. This equates, on average, to a footprint requirement of about 0.25 percent of the conditioned space. Storage equipment may be located in a basement, on roofs, inside or outside, or even buried underground depending on the manufacturer. They may also be easily moved if required in future

building expansions. More than 20 million square feet of air-conditioned space is cooled with energy storage in New York City. So while more consideration must be made in urban areas where the cost of space is at a premium, financial paybacks over the life of the system may justify the investment in space.

**Comfort.** Energy storage is transparent to building occupants. If there is a demand response event thermostats can remain unchanged. In humid regions, ice systems may be designed to lower relative humidity within the building. Other institutions may replace noisy chillers that are located near building occupants with ice storage tanks for a more comfortable environment.

**CASE STUDY:** Sierra College was determined to install a cooling system that created a more favorable educational environment for staff and students, while being reliable, simple and cost effective. No one would stay around Sierra College's Campus Center due to loud chillers. New quiet ice storage tanks placed in the center transformed it into a barbecue picnic area.

### How much can be saved with ice-based thermal energy storage?

**Installed costs.** Since the chiller and electrical component sizes can be reduced, the installed costs of storage can be comparable to conventional systems. Cooling towers and pumps can also be lower in costs because of design synergies. While the payback period is typically three to five years, (more in urban areas, less in rural) the lower energy costs during the life of the system usually make the investment worthwhile.

**Reduce energy costs.** Thermal energy storage technology takes advantage of less expensive, off-peak electric rates to produce cooling energy for use during times of peak demand when electric rates are higher. On-peak rates continue to rise, while off-peak rates hold steady or decrease. On average, the goal of thermal energy storage is to shift 30-40 percent of the HVAC peak load, but it's not uncommon to shift up to 50 percent.

**Reduce peak demand.** Demand charges reflect peak energy usage measured in 15-minute increments across the billing cycle. Amounts vary, but the demand charge is steep — typically 20 to 80 percent of monthly energy costs. Moving a portion of a building's cooling requirements to off-peak can reduce or eliminate peak usage periods. Even with flat rates, facilities are still penalized for spikes in energy use. Those penalties can carry more than a year's worth of utility bills.

**Take advantage of utility incentives.** Since reducing peak demand is important for grid stability, some utilities will offer incentives for buildings that can shift their energy load to off-peak hours. For example, Con Edison in New York City recently proposed a new incentive program that will give buildings up to US\$2,600 per kilowatt of thermal energy storage. It is important to understand what programs a building's local utility offers.

**Demand response programs.** Energy storage is critical for renewable energy and smart grid

# ICE-BASED THERMAL ENERGY STORAGE TECHNOLOGY NOT ONLY SIGNIFICANTLY REDUCES ENERGY AND PEAK DEMAND CHARGES, BUT CAN ALSO REDUCE THE AMOUNT OF SOURCE FUEL CONSUMED.



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# FINANCIAL PAYBACKS OVER THE LIFE OF THE SYSTEM MAY JUSTIFY THE INVESTMENT IN SPACE.

viability. A building with the ability to store energy is already smart grid ready and can participate in demand response programs by virtually selling energy back to the grid. Check with the local utility for program details.

**CASE STUDY:** The first smart grid building in Philadelphia, Pa. USA earned US\$10,000 each month during the summer by turning off its chillers and running cooling with just energy storage in the middle of the day. This income was in addition to electrical cost savings from less expensive off-peak power. 1500 Walnut Street could call on the stored energy to substantially reduce its mechanical cooling load for demand response without impacting tenants, unlike alternative demand response methods such as changing the thermostat and shutting off lights during energy emergencies.

## What are the environmental benefits?

LEED certification. Energy performance credits in the energy and atmosphere section of LEED are earned by reducing costs over a conventional design. Just this past year, LEED v4 for existing buildings added a new credit for demand response and permanent load shifting. To earn these credits, a building is required to be able to permanently transfer electricity demand from peak hours to off-peak hours as defined by the local utility provider. The facility must also demonstrate that it can reduce peak demand by at least 10 percent. Credits are also available for participating in demand response. These are exactly the capabilities that energy storage technologies contribute to a building and its energy use.

Reduces greenhouse gas emissions. Fossil fuel plants are significant contributors to greenhouse gas emissions. Energy conservation on the part of the consumer is an excellent strategy for reducing emissions and will continue to be advocated and promoted. However, pay special attention to conserving the peak energy use which may have the most impact on the environment. By taking advantage of plentiful off-peak energy, thermal energy

storage can essentially shift and level air-conditioning loads which can reduce and/or remove the need for less efficient secondary plants to come online. These secondary plants are usually back-up generators that pre-date the clean-air era and are prone to be less efficient. Therefore, they emit more greenhouse gas than primary generators per unit of energy produced. A California Energy Commission paper reported source energy savings from 8-34 percent by using off-peak energy.

**Increase utilization of renewable energy.** Renewable energy, like wind or solar, are not consistent sources of energy. Solar is not available at night, and wind is not always blowing. Energy storage can capture renewable energy when it is available and save it for use when it is needed therefore dramatically increasing the usefulness of cleaner sources of energy. In areas such as Texas, there is generally more wind during the night however demand for energy is low at night. Ice-based thermal energy storage can tap into that nighttime renewable energy, capturing wind in the form of ice, and then deploy the stored energy the next day by melting the ice.

**CASE STUDY:** The Dundalk Institute of Technology in Ireland uses ice-based thermal energy storage to more effectively utilize the renewable energy produced by the on-campus wind turbine. The installation of ice storage has helped smooth out the electricity grid demand profile by allowing more renewable wind energy to be used on site. The thermal energy storage tanks provided a way for the campus to capture the excess nighttime wind energy created by the campus turbine which evened the peaks and created 30 percent of the campus electrical energy requirements. According to Ediel Donnelly, Building Services Engineer at BDP, "this installation provides the perfect example of how buildings can be used to even the peaks and troughs created on the national grid by the addition of wind resources."

## Final thoughts

The U.S. Department of Energy has

stated that energy storage is a vital technology in modernizing the electrical grid and making renewables more viable in the near future. Buildings that are using an ice-based thermal energy storage system for their air-conditioning needs are not only helping the grid and environment by impacting the largest single contributor to electrical peak demand but clearly benefitting, primarily by paying a fraction of their typical electricity bill.

On average, buildings will see a minimum annual savings of US\$100-150 for every kilowatt of peak demand reduction. Since energy storage can save thousands of kilowatts, there is potential to save hundreds of thousands of dollars. One school district in Florida has announced savings of US\$5 million a year due to thermal energy storage. 11 Madison Ave in New York City boasts US\$1 million per year. Could your buildings benefit from storage? Analyze financial and environmental goals and review your utility bill to see if thermal storage makes sense. **FMJ**

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**Mark M. MacCracken** is the former chair of the board of directors for the U.S. Green Building Council and CEO of CALMAC Manufacturing Corporation, which is the

largest manufacturer of thermal energy storage equipment in the world with more than 4,000 installations in 37 countries.

In his more than 30 years with CALMAC, he has been involved in all aspects of the company including R&D contracts, patents, manufacturing, marketing and finance. He was also the principal investigator on research projects with Oak Ridge National Labs, NASA and National Renewable Energy Research Lab.

MacCracken has a Bachelor of Science in mechanical engineering, three U.S. patents, is a licensed Professional Engineer and is a LEED Accredited Professional.



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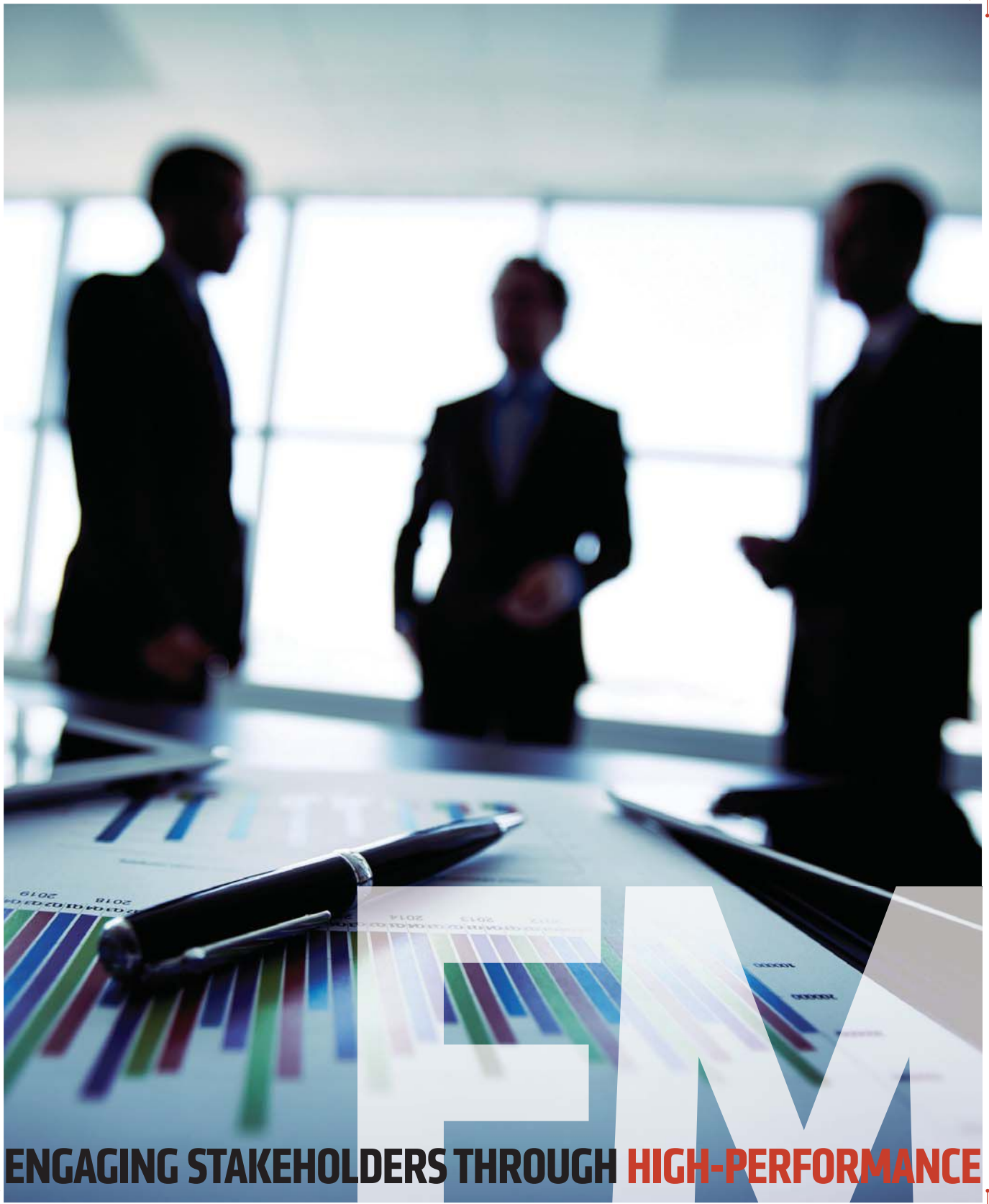
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## ENGAGING STAKEHOLDERS THROUGH HIGH-PERFORMANCE

BY BILL CONLEY

**H**earken back to the days of old when the tasks and responsibilities of a facility manager were defined as “taking care of the people, places and things” in a facility.

There was a balance in this approach, but most practitioners at the time really tried to focus on the people aspect. The scopes of the three original components have altered as facilities



**HIGH-PERFORMANCE BUILDINGS ADDRESS HUMAN, ENVIRONMENTAL, ECONOMIC AND TOTAL SOCIETAL IMPACT.**



and the FM profession have grown and evolved. Technologies, efficiencies and cost savings have all recently come to the forefront, and deservedly so. However, an FM cannot lose sight of the human element in the management of a facility. The components of FM responsibility may have expanded over time, but the concept remains the same.

FMs can now describe their role as being responsible for managing the built environment, encompassing more than just “people, places and things,” and subscribing to a new triumvirate of criteria: those that relate to sustainability and the triple bottom line of “people, profits and planet.” It is of note that the reference to people is consistent in both of these descriptions.

As professionals continually try to minimize the impact of facilities upon the environment, the terms green buildings and sustainable buildings have morphed into the term high-performance buildings. High-performance buildings address human, environmental, economic and total societal impact. They are the result of the application of the highest level of design, construction, operation and maintenance principles — a change in intensity regarding aspects of the built environment. The attributes of a high-performance building can be divided into eight areas: cost effectiveness, sustainability, functionality, productivity, safety and security, accessibility, historical preservation and aesthetics. Running a high-performance building,


then, could be called high-performance facility management (HP FM). This term has been coined to describe FMs who have a sustainability strategy that fully supports organizational objectives. HP FMs strive to reduce both short- and long-term costs, minimizing total cost of ownership while maximizing return on investment. They manage and enhance operations to derive efficiency, effectiveness and ensure that process performance is optimized while providing a quality workplace that promotes productivity. They are responsible for overseeing a facility that instills a pride in existing personnel that keeps them coming back and provides the type of workplace that attracts new employees. Everything an

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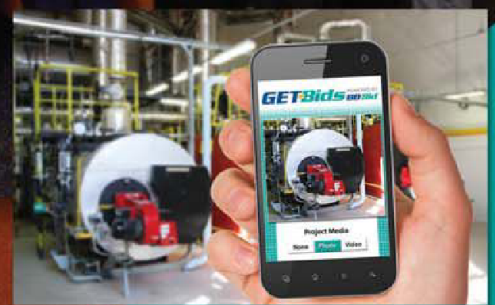
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HP FM accomplishes is done with the wellbeing of all stakeholders in mind.

### Stakeholders

It is critical to understand those for whom these efforts are expended: facility stakeholders. Contemporary business and project practice favors transparent, honest and open stakeholder management processes. An FM stakeholder is a person, group or organization that has an interest or concern in the operations, efficiencies and external ramifications of the facility. Stakeholders can affect or be affected by the organization's actions, objectives and policies. Some examples of key stakeholders are shareholders, senior management, employees, suppliers, government and its agencies and the community the business impacts and from which it draws its resources. From a facility management perspective, intense analysis should be performed to determine who, exactly, is affected by policy, processes and procedures. Those interested parties can be separated into two groups: internal and external stakeholders. Like any mutually supportive relationship, it is just as important to know their needs as it is to understand their importance to facility operations.

### Insider perspective

The first category of stakeholders falls internally. It is comprised of the decision makers in the organization and all personnel. Whether a company is privately held or publicly sold on the stock market, there are always critical eyes on an organization's performance. Shareholders should be made aware of the increasing evidence that sustainability reporting is becoming a major factor in the financial success of business entities. Investors are looking for companies and organizations that will be around

and prosperous in the long term; they see sustainability as a sign that portends a long successful run for their money. The thoughts of the shareholders should be considered regarding corporate social responsibility and company reputation. When they weigh their place in the market, they should understand the importance of sustainability in how they are viewed.

Upper management, if not part of the shareholder group, certainly has strong ties. The C-suite must be made aware of the benefits of sustainability and be advised often about what the program can and is doing for the organization. As well as CSR and the organization's reputation, they should be made aware of how sustainability leads to cost savings, contributions to the bottom line, increased productivity and the innovation that is derived from these efforts. Such programs lead to a competitive edge in the marketplace and enhance the visibility and profile of the company throughout the industry. Checking the barometer of upper management will assist FMs in presenting the most viable options to senior executives in the organization.

Middle management is the one group that must be catered to carefully. These managers can make or break a sustainability program. Without their buy-in, any initiative will have difficulty in succeeding. Discussions and dialogue can be helpful in ascertaining what they need and establishing a quid pro quo for the support of facility management plans and goals. Informal authority is housed strongly within this group and can either be an insidious force against sustainable efforts or provide valuable support. For, while formal authority is well established and visible, forces that play behind the scenes are less obvious. Creating menu-driven facility services catered to the specific needs of each department is one solution.

Ensuring that those few out-of-the-ordinary-scope items that are endemic to middle management's success are provided will garner allies in the workplace. FMs should work to understand these special needs and plan accordingly.

On a strictly personal level, employees benefit the most from a strong sustainability program. In fact, many of the common complaints received by the facility department — temperature disputes, headaches, sickness, noise, glare, etc. — can be mitigated or eliminated through sustainable operations. Sustainable product selection, a green cleaning program, proper lighting and balanced air supply all comprise indoor environmental quality and assist in ensuring that workers are satisfied, healthy and productive. Periodic surveys and monitoring of work orders guide FM departments to what really works in delivering quality of life benefits and an enhanced workplace.

Another subset of the stakeholder group is the facility management department staff itself. Getting their input, acting on their suggestions and involving them in the process leads to empowerment and pride in the work they perform. They can also serve as ambassadors on the floor and are a great resource when it comes to explaining and evincing proper behavior among personnel. Supplemented by education concerning initiatives such as sustainability, inclusion of the staff leads to increased confidence, career development and other sources of innovation within facility operations.

### On the outside looking in

External stakeholders are comprised of those entities that are not directly tied to the goals of the organization. Rather, they are more at the mercy of how an organization is run and can either suffer from

their relationship or benefit from it. This group includes product and service providers, business support groups, the facility surroundings, legislators and the media.

Is it extremely important that vendors are included in an overall sustainability program. The harvesting, production and transportation of products plays a key part in a life cycle assessment (LCA) process. LCAs are performed to satisfy federal mandates like Executive Order 31514, to track carbon footprints or just to comply with environmentally preferred purchasing programs.

Companies that provide services and products to a facility must be engaged in meeting those types of goals. Dialogue should ensue to determine what they can do to comply with sustainability practices, what they will do and in which areas they are unable or unwilling to meet demands. Introducing, sharing, discussing and implementing sustainable practices with providers and vendors serves a couple of purposes. It improves the quality of products and services delivered to the facility and lessens their impact on the environment and, in some cases where chemicals or harmful materials can be excised, on facility residents. It also actually helps them become more competitive and successful in the marketplace.

Knowing, or finding out, what rules and regulations are pending at the government level, as well as understanding the proclivities of local public officials, is an important part of strategic planning. Not only are there laws and mandates concerning sustainability, but regulations set by the EPA, OSHA, Sarbanes-Oxley and other legislation not only dictate how a facilities are operated but also require reporting and documentation.

Keeping ahead of this curve through awareness and by watching the direction of legislation, as well as maintaining a good relationship with governing entities, will prove this stakeholder engagement to be invaluable as the future unfolds. FMs also have the opportunity to educate elected officials, establishing credibility within the

political world and being able to offer sage advice when it comes to regulations that affect the built environment.

Another group that deserves attention is the media. They are always looking for a good story (or a bad one, depending on perspectives) and want to understand and share what is developing in the world.

The media is a prime vehicle for spreading positive news from the organization when discussing sustainable operations.

The stakeholder arena has definitely extended beyond the perimeter of the building and grounds. A facility impacts its surrounding community in many ways. From transportation, traffic and parking issues, to wastewater runoff, gaseous

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**STAKEHOLDER MANAGEMENT  
ACKNOWLEDGES THE NEEDS,  
CONCERNS, WANTS, AUTHORITY,  
COMMON RELATIONSHIPS AND  
INTERFACES EXTANT IN FACILITY  
MANAGEMENT.**

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emissions and light trespass, there are many aspects of an organization's operations that can unduly affect its neighbors. Continual contact with those in proximity to the facility will pave the way for better relations. Being proactive in this regard far outweighs the negativity and poor public image that comes with having to react to a problem. In a way, this could be viewed as facility management on a larger scale: taking care of people without boundaries. Also, it is important to note that an FM's organization is as much a stakeholder in the community as it is of the community.

**Stakeholder management**

Stakeholder management acknowledges the needs, concerns, wants, authority, common relationships and interfaces extant in facility management. The process includes utilizing the dual tools of engagement and communication. Engagement is primarily focused on both parties getting to know and understand each other. It is the opportunity to

discuss and agree on expectations of communication and to agree on a set of values and principles by which all stakeholders can abide and realize benefits. Engagement does not seek to develop the project or business requirements, nor is it used to delineate problems, create solutions or establish roles and responsibilities.

Communication is the two-way dialogue between FMs and their stakeholders. Expectations can be established and periodic updates can be provided. What a stakeholder can do and how it can be accomplished is just as important as how an FM maintains a sustainable operation. The message from the facility side should be on point and focused on how this arrangement is delivering benefits and an FM should be open and understanding of stakeholder input. The "what's in it for me" perspective is extremely important in keeping everyone on track.

**Let's not forget**

FMs also serve their own profession. As much as developments in the ongoing growth of facility management have advanced individual careers, so too have FMs advanced the practice. Every innovation, every success story that is communicated to the world, is an initiative that can be replicated for the benefit of other professionals and other organizations that belong to the global community looking for sustained success. It creates a reputation for cutting-edge practices within the facility management world. It leads to recognition among the FM peer group, requests to speak at conferences and even the opportunity to write for trade journals like FMJ. How cool is that? **FMJ**



**Bill Conley**, CFM, SFP, FMP, IFMA Fellow, LEED AP is owner/CSO of CFM2, a facility management and sustainability consulting company based in Orange

County, Calif., USA. Conley has more than 35 years of experience in the facility management profession and has been a proponent of sustainable operations for more than 20 years.

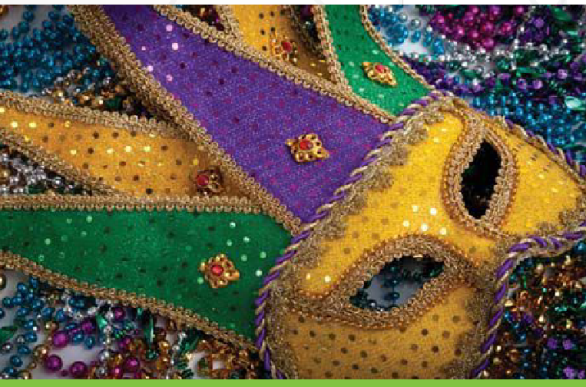
Conley has served on the IFMA board of directors, is a recipient of IFMA's distinguished member of the year award and has twice received the association's distinguished author award.



# FM



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# MAKING OCCUPATIONAL HEALTH AND SAFETY PART OF YOUR

## ORGANIZATION'S DNA

BY MIKE HICKMAN

Increased costs, heightened reputational risk, reduced productivity — these are some potential penalties for apathetic occupational health and safety (H&S) compliance and for insufficient risk management. But despite the number of high-profile disasters over the past few years, H&S remains a pressing issue for companies worldwide.

Some industry sectors have grasped the potential impact of H&S earlier than others. The focus on H&S also varies with the type of real estate portfolio. It must be stressed, however, that although the likelihood of major H&S issues occurring is considerably lower in a corporate office than at a manufacturing facility, it can be a costly mistake to center all attention on the high-risk part of the portfolio and overlook low-risk environments.

Additionally, while many organizations have H&S programs in place, they have yet to translate these policies effectively.

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How to Run an  
Occupational Health  
and Safety Meeting



## REDUCING

- Employee turnover
- Sick leave and absenteeism
- Costs: insurance premiums, legal fees
- Material damage

FIGURE 1:

Direct and indirect benefits of strong H&S performance



## IMPROVING

- Employee health and well being
- Employee satisfaction and morale
- Corporate reputation
- Corporate image
- Productivity

### The case for health and safety Risk management and improved performance

In several high-risk sectors, H&S policies have moved to the forefront of corporate strategies over time. For example, many organizations in the oil and gas, chemical and construction sectors have stringent H&S policies and controls in place across the whole organization, as safety failures in those industries can be catastrophic.

Traditionally, companies in low-risk sectors, such as financial services, retail and education often have not had comprehensive H&S policies in place. Nonetheless, while the likelihood of large-scale disasters in these sectors is lower, the potential impact can still be significant, ranging from increased costs (e.g., insurance fees, litigation and the like) to reduced employee productivity (e.g., sick days) and reputational risk. Getting H&S right among such companies can also produce benefits that can positively influence their bottom line.

#### A focus on workplace health

H&S policies tend to focus primarily on safety and accident avoidance. However, truly comprehensive H&S strategies also look at the impact of the physical and psychosocial work environment, covering issues related to stress (e.g., unfair treatment, bullying and insufficient variety of work) and various health risk factors (e.g., prolonged fixed posture, repetitive motion or monitor reflection).

#### Contributing to productivity efforts

Currently, strategic demands by the C-suite on FM teams to improve workplace and workforce productivity are increasing. However, while workplace reforms, such as flexible or remote working, increased utilization of space and technological innovations, are widely covered in research

and media, the impact of an effective H&S strategy on productivity is often overlooked, particularly in corporate office environments.

The direct impact of a strong H&S performance is sometimes difficult to quantify. Nonetheless, healthy work environments, reduction in accident occurrences and overall improvement in physical and psychological health of staff have been shown to enhance the organizational environment and improve employees' desire and ability to work, thereby improving productivity.

Many companies miss out on the opportunity to achieve these productivity gains, as they are ill equipped for effective change management, a prerequisite for driving a culture of H&S.

#### The challenge

It is widely accepted that more than two thirds of change initiatives fail. Given the range of potential barriers, H&S programs for behavioral change are no exception.

In many countries, H&S standards, culture and legislation dictating H&S requirements are non-existent. The differences in cultural attitudes toward safety and the consequent pushback against change can disrupt consistent implementation of H&S across an organization.

At an operational level, practical issues can often hold back a fully integrated change. For example, the behavior of individuals outside the organization (e.g., other occupiers in multitenant buildings, clients in commercial spaces or third-party service providers) to a certain extent cannot be influenced.

However, the main barriers to change are typically found within organizations themselves. In most corporate settings, there is usually no clear understanding of the need for H&S, as well as a lack of management and financial support, accountability, communication and follow through, thereby leading to failed change implementation.

#### The role for FM

Successfully driving change toward a more engaged H&S behavior requires involvement across the whole organization. Tasked with providing a healthy, safe and productive workplace, FM teams are uniquely placed to direct such a change. The accelerating collaboration between facility professionals and other corporate functions (Figure 2) results in the ability to make the required connections and influence all parts of the organization.

FM teams can choose from a wide variety of change management models. However, success lies in generating among employees an appetite for, and the ability to, change.

Ability arises from enablers, or the factors required to facilitate change (e.g., the environment, technology, process and hard skills). Employees will ask themselves if they can adjust their behavior and if they will be supported accordingly. Involving planning, timing, skills and commitment, creation of this ability is the hard side of change programs.

Considered the soft side of change, appetite arises from understanding the commitment to an H&S-conscious behavior and agreeing on what's next. Past change experiences and cultural frames shape this willingness, and often personal variables such as emotions,

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expectations and ego come into play. Compared to ability, appetite is more difficult to influence.

When launching an H&S change management process, three key factors — vigorous communication, strong employee participation and robust platform building — will help to overcome cultural, operational and organizational challenges.

### Communication

To develop effective H&S behavior, there should be clear, consistent, constant and concrete communication throughout the entire change management process.

**Clear:** The vision needs to be something that every employee can relate to and support. Industry examples of clear and simple message taglines that create an H&S brand include: “Goal Zero,” “Nobody Gets Hurt,” “Committed to Zero” and “Making Zero the Hero.”

**Consistent:** The same message needs to be communicated at each level of the organization — global, regional, country or site — and implemented along the entire supply chain. While the consequences of employee actions can differ greatly between sites, the behavior should be uniform.

**Constant:** The H&S message and its implication must be frequently reiterated and, if necessary, advanced. Maintaining constant two-way communication will increase commitment. Frequent status updates, including success stories, will also improve engagement both at the top and with the general staff, as everyone will see how the H&S program is positively affecting individuals and the organization.

**Concrete:** The message must be actionable and should demonstrate how to do it right. In 2008, ArcelorMittal launched “Journey to Zero,” an H&S program that aimed to achieve zero fatalities, accidents and occupational illnesses. To cultivate a shared sense of responsibility, ArcelorMittal set 10 golden rules every employee should follow to contribute to a safer and healthier workplace.

## PRODUCTIVITY

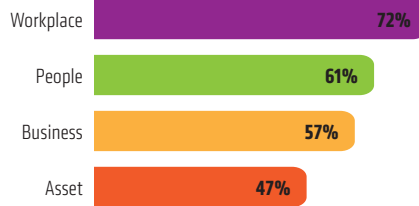


FIGURE 2: Delivering improved productivity outcomes is a high expectation of FM

A strong communication plan covers the entire change management process — during the establishment of the business need, throughout the implementation period and when reinforcement of the H&S behavior is required.

It must be clear to all how they can and should take part in achieving the organization’s H&S vision.

### Participation

Strong leadership support, with active bottom-up participation, is imperative to foster consistent behavior across the organization.

**Strong leadership:** Strong endorsement at the leadership level is essential. First, senior management should lead by example and champion the H&S-conscious behavior expected of everyone in the company. Furthermore, senior management should support the policy from an organizational and financial perspective, providing a sufficient H&S budget. To this end, FM teams should present a clear business case and vision.

**Employee participation:** Strong bottom-up involvement in shaping H&S policies is arguably the single most important factor in developing engaged employee behavior. It is well documented that employees feel more appreciated when they are involved in developing the solution, and therefore, will be far more committed to the outcome. By including employees in the process, resistance to change will decrease significantly.

For employee participation to be successful, an open dialogue where everyone can speak up and challenge existing programs, is

necessary. Cultural differences also need to be understood and taken into account. The use of change agents, enthusiastic employees at the front line of operations who champion the correct H&S behavior, can further improve overall employee commitment to the program.

**Reinforcement:** Both positive and negative reinforcement can be used as change accelerators. Negative reinforcement usually works for a while but can also significantly deteriorate the appetite for change. Positive reinforcement is, in the long run, a much safer bet and can result in strong commitment from employees. In this respect, FM teams can learn from other organizations’ sustainability programs.

Local and regional audits by in-house teams or independent outsourced providers to check if the overarching H&S policy is integrated across the organization are also essential.

**Make it personal:** Strong, personalized, online and face-to-face training programs have recorded solid success in terms of staff engagement. Customizing training and education programs that show how employees can apply H&S behavior in their personal lives will often encourage them to take full advantage of the tools and information provided by the company.

### Platform

H&S governance is often a shared responsibility, but facilities teams must be aware that they are uniquely placed to take the lead in providing a safe and healthy workplace.

### H&S governance

In many organizations, responsibility for H&S sits with the HR, legal, operations or in some cases, even finance staff in addition to their day-to-day work. Assigning sole responsibility for designing, implementing and monitoring the H&S policy to the aforementioned functions, particularly at a senior level, significantly increases the risk of insufficient prioritization and unsatisfactory communication.

The form of the H&S safety function obviously differs, depending on factors such as the nature and size of the organization. Whatever the case may be, two things are crucial: strong leadership from FM and support from and integration with other corporate functions.

### **Dedicated H&S function**

Integrating H&S with other support functions is crucial for providing a strong platform for change. For example, communicating feedback up the chain of command is necessary to receive adequate funding and prioritization. The finance and IT teams play an important role here.

While quantifying the financial impact of a failure is relatively easy, measuring a successful H&S policy can be more challenging. IT and finance can develop performance measures in areas such as sick pay, lost time, repairs, legal costs or fines, thereby assisting in preparing a business case. The communications team can then use its expertise to effectively deliver success stories and the wider positive impact of a successful H&S strategy back to senior management.

## SUCCESSFULLY DRIVING CHANGE TOWARD A MORE ENGAGED H&S BEHAVIOR REQUIRES INVOLVEMENT ACROSS THE WHOLE ORGANIZATION.

### **Clearly visible H&S contacts**

Assigning clearly visible, local and approachable H&S contacts will increase the likelihood of the general staff reporting issues and participating in creating a healthier work environment. When fully resourced and trained, H&S agents can provide a vocal and engaged mechanism for change.

### **Supply chain**

H&S considerations are crucial when selecting contractors and suppliers. Selected third-party service providers should uphold the same level of commitment and behavior and, when it comes to service provider selection, alignment with the H&S quality requirement should be the absolute minimum.

The right service partners can often help transform organizational H&S behavior and bring industry best

practices to the table.

Facility management teams can also leverage their expertise to raise awareness, set up communication campaigns, monitor and analyze H&S performance, establish control measures and manage the H&S performance of contractors, suppliers and partners. **FMJ**



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platform for Asia Pacific.

Hickman has 19 years' experience as an EHS professional working across a range of sectors including manufacturing, construction, property and facilities management and utilities. He has been with the firm for two years and joined from British Gas where he was the head of health and safety.



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- Click **Add Contact**
- Select **IFMA\_MASTER**
- Click **Connect**

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- Click the **MyPortfolio** tab and select **Share with Others** in the drop-down menu next to the property you want to share
- Select the facilities in your **Portfolio Manager**

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- Click **Continue**
- Set permissions to **Read Only Access**
- Click **Share Property(ies)** to send a sharing request

#### **STEP 3: REVIEW SHARED PROPERTIES**

- View sharing requests in the **Sharing Notifications** section

Learn more at:  
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# SUSTAINABILITY COLUMN

**MARINA BADOIAN KRITICOS**  
Director, Sustainability



IFMA provides FM professionals with the tools, knowledge and resources to learn how to find, fix, solve, connect, share and advance their careers. Credentials, ongoing research, publications, advocacy and public and private sector partnerships support IFMA's continued efforts to provide members and stakeholders with the information vital to sustainable facility operations.

### How to: Lead sustainable strategies in your facility

The Sustainability Facility Professional® (SFP®) credential helps experienced facility professionals play a key leadership role by giving them the necessary skills to impact their organization's triple bottom line.

The course is designed to provide FM and related industry professionals and suppliers with an understanding of how facilities can be improved in the areas of energy, water, resources, workplace management, indoor environmental quality, waste, site impact and service quality. The SFP teaches industry professionals to integrate sustainability efforts with organizational values, present a business case for change, financially evaluate initiatives and track and report accomplishments.

### How to: Learn more about a specific topic

IFMA and the IFMA Foundation, with support from IFMA's Sustainability Committee, produce a series of white papers on sustainable FM topics. The peer-reviewed Sustainability How-to Guides are available for free download at [foundation.ifma.org/research](http://foundation.ifma.org/research).

Each includes case studies, ROI analysis and business case development to assist you in implementing sustainable practices in the built environment. The guides cover myriad FM-related topics, are updated periodically and new guides are published on an ongoing basis. After reading, feel free to send me your feedback and ideas for new guide topics at [marina.kriticos@ifma.org](mailto:marina.kriticos@ifma.org).

### How to: Benefit from the collective expertise of fellow FMs

Launched at the 2014 Facility Fusion D.C. event, the new online Environmental Stewardship and Sustainability Community (ESS

COMM) aims to increase the visibility of sustainable facility management. The community allows members to engage, share best practices, tips and tricks and to take advantage of the collective wisdom of peers to gain knowledge. Pose a question, share a best practice, answer a query and collaborate without boundaries at [community.ifma.org](http://community.ifma.org).

### How to: Meet the challenges and opportunities of high-performance facilities

Habits formed at the workplace often translate to our personal lives. How can you help your team sustain the environment, promote wellness and support the local community?

- Be knowledgeable and proactive about sustainability. Earn a credential or certification, join online conversations, talk to your peers and learn what is going on not only within your industry, but in related disciplines.
- Train your department in high-performance building systems, facility rating and other aspects of sustainability. This may require both in-house training for the skillsets that exist internally and more formal off-site training, such as programs offered by universities, community colleges and industry groups and associations.
- Everyone is busy, but try to continually evaluate best practices and, when applicable, propose changes that match your organization's values. Keep up with economic incentives available locally — sometimes it is amazing what you can find — and maintain your leadership position on the subject. Most importantly, be proactive and approach senior management with proposed solutions; don't wait to be asked.
- Earn the SFP.

These are just a few of the ways IFMA can support your efficiency efforts. Taking advantage of these types of learning opportunities will help you and your team better understand green building and the connection between sustainability and the organization's bottom, or triple bottom, line. **FMJ**



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Through the IFMA Community, members will have access to real-time discussion and information exchange related to facility management and building operations and management.

The IFMA Community provides a place for users to post and generate discussion on either a general or specific topic and to learn from the collective wisdom of peers.

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- Volunteer manager
- Regular contributor
- Volunteer moderator
- Subject matter expert
- Share ideas, expertise, best practices



Have your say or follow a discussion on topical issues and matters that affect you professionally. Join the conversation at [www.Community.IFMA.org](http://www.Community.IFMA.org).

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Effective  
Change Order  
Management

# THE FUTURE OF CHANGE ORDER MANAGEMENT

BY PAUL SCHREYER

**C**hange orders are a way of life in construction. During the course of a project, owners change their mind about products, equipment and finishes, unforeseen conditions are discovered, work is deleted, work is added and so on. Negotiating change orders is a substantial administrative burden for owners, FMs and contractors. In addition, contractors are understandably hesitant to start significant changed or extra work without an agreed-upon price. Waiting for a change order to be negotiated can delay the project.

## The problems with change orders

Negotiating change orders takes time and consumes administrative resources. In addition, resolving change orders can cause project delays, which cost money. Not only do project delays increase job site overhead and management costs, but they extend the date by which the project can be put to use. Whether it's a renovated bridge, a new public school or a revenue-generating enterprise such as a hotel, delays increase costs and decrease realized benefits.

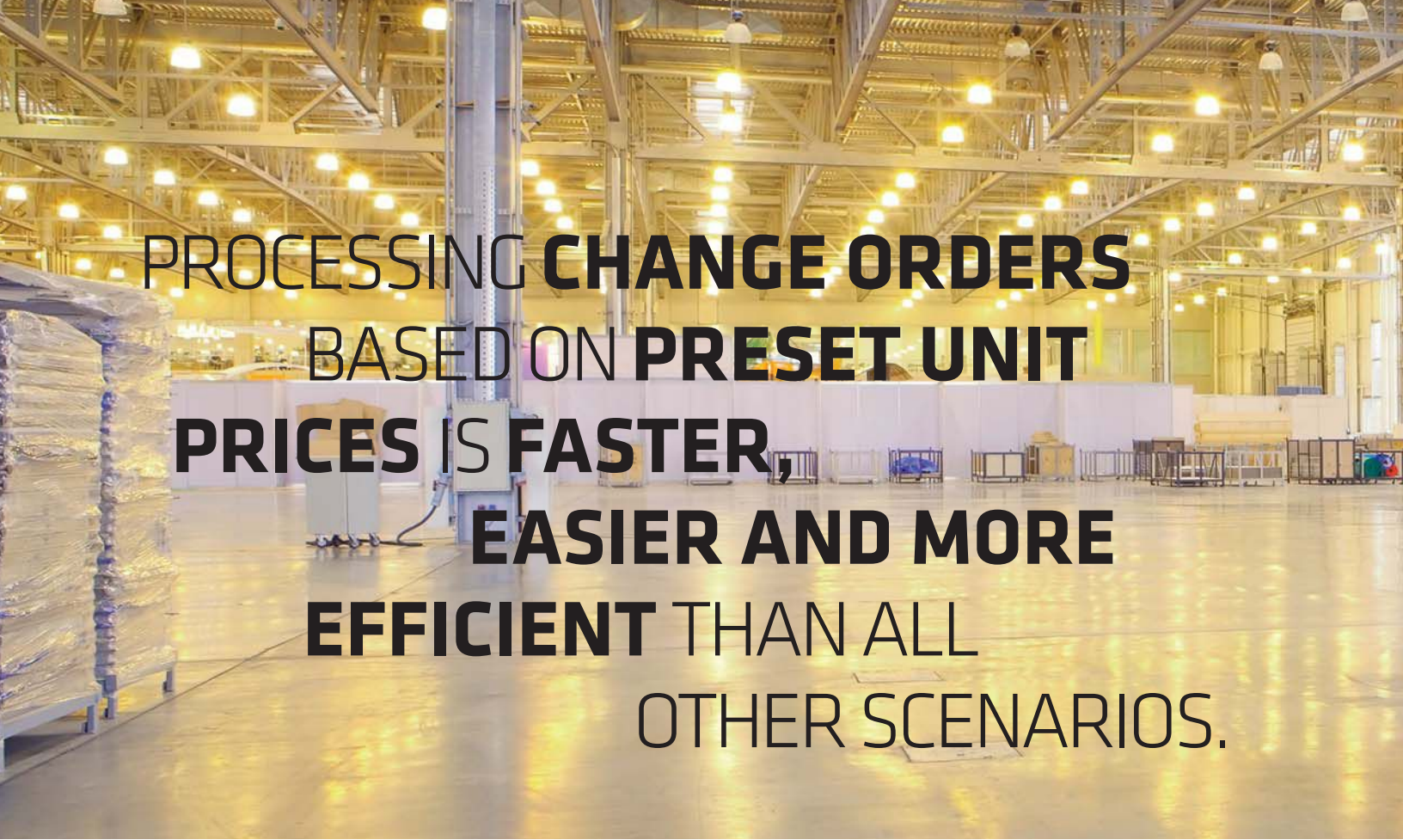
On public construction projects, given the requirements for competitive bidding, and on private projects, given the difficulty of injecting a new contractor into an ongoing project, owners have limited options in for completing changed work with someone other than the existing contractor.

For the most part, the project and facility managers are stuck dealing with the existing contractor. As a result, they are generally in a weakened position when negotiating change orders. Their main goal is to get to a reasonable price and move on. Easier said than done. Owners and FMs are seldom confident that they negotiated a good price for change orders. In some cases, they know that they overpaid.

A recent audit by Washington State<sup>1</sup> identified many of these problems. The audit summarized the change order pricing issues as follows: "Change orders usually are negotiated after the contracts have been awarded, so contractors...are better positioned to obtain more generous pricing for labor, materials and equipment, and markups for overhead and profit."

## Current change order pricing systems

Most construction contracts include a provision that permits the facility manager to make changes to the scope of work and includes basic language setting forth how changes are to be priced. Some clauses include a fixed markup for labor, equipment, material and subcontractor costs, or may require that all equipment for change orders be priced by referencing a standard equipment pricing guide. For public projects, labor rates are generally fixed at the current prevailing wage rates, so agreeing on the labor rates is easy. The hurdles presented by change order costs tend to be negotiating how many hours are appropriate for the task performed (i.e. productivity) and whether the contractor got the best available price for materials.



# PROCESSING CHANGE ORDERS BASED ON PRESET UNIT PRICES IS FASTER, EASIER AND MORE EFFICIENT THAN ALL OTHER SCENARIOS.

For some projects, where there are preset unit prices for most tasks, the change order process is relatively straightforward. This is true for many civil construction projects such as road work, large excavation projects or something as simple as a concrete sidewalk replacement where contractors bid unit prices multiplied by estimated quantities.

For these projects, the cost of changes will be based on the preset unit prices and the change order process moves quickly and efficiently with minimal room for arguments or negotiation. Also, the likelihood of project delays resulting from drawn-out change order negotiations is eliminated. The contractor knows payment will be based on unit prices, so the work progresses. Processing change orders based on preset unit prices is faster, easier and more efficient than all other scenarios.

### **Expanding the solution**

The ability to establish preset unit prices has proven to be more difficult for general building construction work

because there are thousands of tasks that may be associated with a typical building project. But, if this can be done, the benefits will outweigh the costs.

The leading recommendation from the Washington State audit was to contractually “establish the basis for reasonable and typical prices and rates for labor, materials, equipment and markups.” Developing preset unit prices goes one step further. So, how do we get there?

FMs can start small. A school system can develop preset unit prices for commonly completed construction projects such as classroom doors, locksets, exit devices, ceiling tiles, VCT and other similar tasks. In the construction contract, the school system can require that all change orders involving tasks for which a preset unit price exists will be priced using those unit prices. A local department of public works can develop preset unit prices for standard tasks such as installing concrete and asphalt curbs, delivering imported aggregates, replacing inlet grates, etc. Over time, owners and project/facility

managers can build a substantial library of unit prices.

Unit prices should be updated periodically as labor rates increase and material prices fluctuate. The unit prices should also account for variations in quantities. The unit price to paint 500 square feet of drywall should be more than the unit price to paint 10,000 square feet of drywall.

If the database will be used for pricing changes in renovation, alteration and upgrade projects, it is best to include unit prices for removals and demolition work. For example, if a unit price is included for installing lay-in ceiling tiles, there should also be a unit price for removing those ceiling tiles. The same is true for windows, roofing, lavatories, VCT, doors, bathroom accessories, etc. Without removal and demolition unit prices, those tasks will have to be negotiated in the traditional manner.

As the unit price database increases in size and complexity, it will become



more difficult to keep the prices up to date. It will also become more difficult for contractors to prepare price proposals using the expanding database. However, there have been significant advancements in preparing construction unit price calculations using only local labor, material and equipment prices and in providing Web-based applications which can be used to generate price proposals from unit price databases.

Although there are published estimating guides available from different sources, they are not appropriate for establishing contractually preset unit prices. Unit prices are not locally priced, so the labor, material and equipment costs will not line up with the contractors' actual costs. Also, the task descriptions are generic. They do not include unit prices for most removal or demolition tasks and do not include quantity discounts for most tasks.

As a result, using a nationally priced general estimating guide will cause

more problems than it will solve. It is difficult to get local contractors to agree to be paid at national prices unless they are higher than local rates.

The keys to establishing a usable unit price database for pricing change order work include:

- Task descriptions must be specific and accurate (“3/4-inch native crushed stone” instead of “gravel;” “grade 1, Fo5 Function mortised lockset” instead of “classroom lockset”);
- Unit prices must be based on local labor, material and equipment pricing;
- Unit prices must include removal and demolition tasks and
- Unit prices must take into account varying quantities.

Establishing preset unit prices for change order work simplifies the negotiation process, reduces administrative effort and can avoid delays. To date, the variety of construction tasks associated with a

typical construction project has made it difficult to establish unit prices up front. However, recent advances in localized unit pricing data and integrated Web-based applications have brought this solution within reach. **FMJ**

#### REFERENCE

1. “Local Government Performance Audit Construction Change Order Pricing,” Jan. 10, 2012, Report No. 1007057, Washington State Auditor’s Office.



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Schreyer has a Bachelor of Science in construction from Bradley University and a law degree from Quinnipiac School of Law. He may be reached at [p.schreyer@thegordiangroup.com](mailto:p.schreyer@thegordiangroup.com).

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### BREAKTHROUGH PROJECT FINANCING FUND UNLOCKS ENERGY EFFICIENCY MARKET

Until now, the energy efficiency market has been dominated by several large energy service companies that specialize in multi-million-dollar “turnkey” energy savings projects for mostly government customers – often involving the complete renovation of entire facilities.

But recent advances in energy-efficient systems for buildings, such as LED lighting and intelligent building controls, are bringing energy efficiency to the mainstream, in effect creating a mid-market for lower-cost energy efficiency with virtually any commercial or industrial building.

What has been missing is a financing solution that allows these mainstream customers to pay for their efficiency projects and retrofits according to how much energy they actually save, making the projects cash-flow positive from day one.

Noesis Energy addresses this gap in the efficiency-financing marketplace with the Noesis Shared Savings Agreement. It's modeled after the popular solar power purchase agreement that has driven huge growth in residential solar.

The US\$30M fund is backed by a top energy-efficiency financing provider.

Learn how the Noesis Energy platform works by visiting [www.noesisenergy.com/site/how-it-works](http://www.noesisenergy.com/site/how-it-works).



### ENVIRONMENTALLY SUSTAINABLE FLOOR PADS

3M, a leader in the development of environmentally sustainable products, announced that many of its popular floor pads will now be made with recycled materials. Beginning in March 2014, the polyester fiber used to make a range of pads for floor maintenance will contain a minimum of 50 percent post-consumer recycled content.

The 3M product team extensively tested the product to ensure the new floor pads have the same high-performance standards as those made without recycled fibers. The result is a floor pad that is durable, washable, reusable and longer lasting, helping to postpone end-of-life landfill disposal. Compared to the closest competitor, 3M floor pads remove deep scuff marks seven times faster, are nearly 40 percent more effective at floor stripping and have 50 percent better burnishing durability.

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The new NOVA.16 panel reduces the number of control panels required for multi-door systems.

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Any Wiegand device can be connected to NOVA.16, including keypad, biometric, long-range and other key card readers. Its communications lines are hardened with gas discharge tube surge suppression. It boasts a 3-amp power supply with noise immunity and continually monitors backup battery status.

Further information on software-based systems with proximity technology is available at [www.securakey.com](http://www.securakey.com).



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By lowering the total cost of ownership for buildings with a smaller footprint and enabling wireless control and networking of building systems, the SmartStruxure Lite solution provides a quick return on investment.

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Visit <http://bit.ly/1mj3eoD> to learn more about how SmartStruxure Lite can assist small- and medium-sized facilities to create a more efficient and sustainable business model.

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Dialight’s integrated controller is mounted at the base of the structure for easy access and features a dual-certified enclosure with real-time data reporting from the lighting system to the controller. Panel-mounted red and green LEDs indicate the system status at a glance, while the enclosed backlit display enables easy event and alarm monitoring and diagnostics. The controller is dual-voltage certified for 120-240V AC or 125V DC operation. A complete dry-contact alarm recording system indicates power and communication failure, sync alarm, white, red and sidelight alarm, plus photocell and day/night mode transition alarms.

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- To access data: Click "Query Database"



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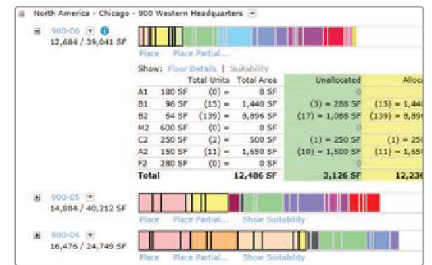
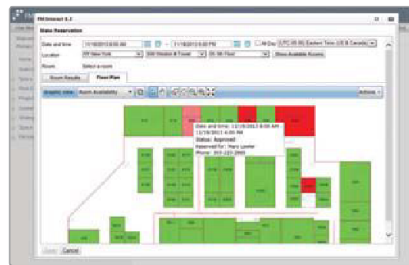
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# FMJ EXTENDED

MAY/JUNE 2014

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# ASK THE EXPERTS

BY IFMA'S FACILITY MANAGEMENT CONSULTANTS COUNCIL



In each issue of FMJ, IFMA's Facility Management Consultants Council shares some commonly asked FM-related questions accompanied by advice from top facility management consultants. The questions and answers presented in this section align with IFMA's core competencies following the themes outlined for the given edition of the magazine.

While the following answers are intended to be helpful, these responses should not be deemed complete and are limited in context by the space allocated. Please contact the individual consultants directly for further explanation of the opinions expressed.

The theme of this edition of FMJ is **"How to: Tips and Solutions."**

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The Facility Management Consultants Council (FMCC) represents more than 300 FM consultants from various countries around the globe. Its mission states, "The FMCC is the resource and voice for facility management consultants worldwide to leverage our collective expertise to benefit IFMA members, and the facility management profession."

Questions regarding the Ask the Experts section of FMJ can be directed to John Ringness, SFP, MRICS, CBIFM, president and CEO of NEXT Facility Management Solutions and FM Consultants Council president, at [john.ringness@nextfms.com](mailto:john.ringness@nextfms.com).

Visit FMCC online at [fmcc.ifma.org](http://fmcc.ifma.org) or join the conversation on the council's LinkedIn group at <http://linkd.in/1gAa8ae>.

## QUESTION 1

I AM TIRED OF HAVING TO PURCHASE THE LOWEST-PRICED ITEM ON THE MARKET ONLY TO HAVE IT BREAK AND NEED REPLACING SIX MONTHS LATER. DO YOU HAVE A METHOD TO CALCULATE A MORE COMPREHENSIVE COST OF OWNERSHIP?

**ANSWER:** When I first started doing life cycle costing, it was a long, tedious process to calculate the total life cycle cost as a net present value (NPV), which is the sum of all future costs adjusted to today's dollars.

With Excel, there is a built-in formula to calculate NPV. Now, the only hard part is establishing the annual costs.

This simple example shows the difference between two equipment options. In this case, the more expensive equipment has the lowest NPV, or lowest total cost, over the seven-year lifespan.

This is the kind of proof you need to justify your decision.

	INITIAL	Y1	Y2	Y3	Y4	Y5	Y6	Y7	NPV
OPTION 1	-12,000	-1,875	-1,926	-1,979	-2,033	-3,589	-2,147	-2,206	= -12,000+NPV(0.05;Y1:Y7)
OPTION 2	-14,000	-1,225	-1,258	-1,293	-1,328	-1,365	-1,402	-1,441	= -14,000+NPV(0.05;Y1:Y7)

The formula for NPV is shown above. It's the initial investment (purchase) plus the net present value of the future annual cash flows, which is automatically calculated. The cash flows include all parts, supplies, repair, maintenance and energy costs inflated annually. The discount rate for future cash flows used here is 5 percent (0.05 in the formula). You should ask your CFO for the discount rate and inflation rate he or she recommends you use.

This simple example is all you need to calculate your own life cycle cost NPV. It will help you make decisions about

equipment replacements and justify your decision to your boss or chief finance officer.



**ANSWERED BY:**

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## QUESTION 2

WHICH ARE MORE IMPORTANT: KEY PERFORMANCE INDICATORS (KPIs), SERVICE LEVEL AGREEMENTS (SLAs) OR STANDARD OPERATING AGREEMENTS (SOPS)?

**ANSWER:** Well, all three are equally important, right? I call it the operational trifecta. They are indeed all very important when creating a high-performance FM organization; however perhaps there is a natural starting point.

It is my opinion that you must know what KPIs are important before you start the SOP creation in order to properly integrate them into procedures. Only measure what you will really need to make decisions and then you can create realistic and well-designed SOPs (gathering data for data's sake is a waste). The FM operations will be better organized, more efficient and effective if you develop, communicate and utilize maintenance policies, practices and procedures that are clearly

documented and distributed to the FM staff and stakeholders.

Service levels should then be defined to enable the FM group to measure against the targets or KPIs. It is imperative that SLAs are clearly communicated to customers and agreement of expectations and service delivery can be achieved based on the available resources. This is often the difficult part of the process as the customers may have an expectation of achieving one level of service and the FM may only have the resources (time, money and manpower) to deliver another.

Take the time to establish a reasonable level of quality as the goal. Bottom line, the establishment of SLAs, SOPs and KPIs is the backbone of an

effective FM organization. Investing the time to do this "homework" with your team will pay great dividends in the end.



**ANSWERED BY:**

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# WITH 3D PRINTING

## ANYTHING IS POSSIBLE

### INTERVIEW WITH ERIK ERNST

*This article was contributed by Facility Management Netherlands from their official publication, FMI, and has been translated from the original Dutch.*

*Developments in three-dimensional printing are moving extremely fast with the expectation that they will bring major changes for everyone. FMI interviewed Bas Luiting of the Clean Tech Factory about developments, trends and changes with the advent of 3-D printers for society and especially for FM.*

In his studio a machine is rattling away in the background with sounds reminiscent of the matrix printers of the '80s. It appears to be a 3-D printer busy printing a large block. Redesigner Bas Luiting (Clean Tech Factory) talks passionately about his 3-D printer: the Ultimaker.

Luiting: "When you give a 3-D printer a print job from a digital 3-D drawing, it builds the object layer by layer. You can do this with (bio)plastics, but also with metal, plaster and chocolate."

#### The Ultimaker

The Ultimaker is a 3-D printer developed in an open-source environment in the Netherlands. That means that anyone can make a contribution to the further development of the printer. Luiting is happy to do his bit: "I am now researching whether I can upgrade the printer, just as I used to do with my

moped. I am now drilling the hole of the print head further and further, which allows the printer to work much faster. I have been able to shorten a four-hour printing process to one hour. I then share this knowledge through forums with other Ultimaker users. In mid-October I am expecting my new Ultimaker 2.0, which can achieve even more precise and faster printing."

#### Development

When asked where the 3-D printer currently is in the development cycle, Bas Luiting replies as follows: "The current 3-D printer is at the level of the matrix printer of the '80s. At the moment the development of 3-D printing is on a sort of voyage of discovery in which it is becoming clear that it is a world of its own; knowledge, open-source software, designs and materials in this area have become common property over the Internet.

"Nowadays a good 3-D printer costs between 900 and 2,500 euros and this is on the high side for an average consumer. In 2014, however, the mass production of these devices will start and it will be possible to purchase a reasonable 3-D printer for 400 euros."

When asked about possible applications, Luiting becomes enthusiastic: "3-D printing has endless applications. Think of designing jewelry, lamps and furniture or replacing defective parts of existing products in the home yourself. You can design a three-dimensional object on your PC yourself or go to one of the many open-software websites where you can use any of the unimaginably large number of options for free or at a very low cost.

"At the moment I am using the 3-D printer for the redesign of a BB Bricks building block which I used to play with

as a little boy, but now in a format for an adult. It is a redesign on a new business model that I recently introduced during the Dutch Design Week.”

### 3-D building

Once the “home 3-D printer” is an affordable reality, you will be able to print any design yourself.

Luiting: “Or you can use 3-D printing houses, which I think will shoot up out of the ground like mushrooms. And what about the applications for the medical world, the food industry, the automotive and construction sectors? There too we are on the threshold of major changes.

In the biomedical industry one can envisage dental components such as crowns and other dental prostheses, but also blood vessels and various human tissues; in the automotive industry one initially thinks of components, but there are already complete printed body parts; the food industry is already focused on the printing of sweets, but pizza bases or — a topic recently in the news — the cultured-meat hamburger are also possibilities.

For the building industry, it seems amazing that we could print entire buildings, but if the printer is large enough that is really one of the possibilities. Already there is a battle taking place in the Netherlands about who will print the first 3-D building. In Amsterdam they are thinking of printing a full-size canal.”

### Design and manufacturing

“That the introduction of the 3-D printer will lead to change is obvious, but that the entire logistics process will be turned on its head is not fully realized,” says Luiting. “For example, China will no longer be the only workshop of the world, and the logistics of raw materials will be more important than the end product itself.”

“3-D printing even has implications for inventory; just-in-time production will become prominent so that there is much less need to produce stock. A major trade will emerge in commodities that can be used in the 3-D printing world and there will

## THREE-DIMENSIONAL PRINTING IS THE NEXT DIGITAL REVOLUTION, WHICH WILL BE UNPRECEDENTED.

be a shift in the design and manufacturing industry. Much of it is already happening with companies and individuals. I could go on and on like this about all the changes that are in the pipeline.”

### Consequences for FM

The implications for FM could be huge.

Here are some examples:

- **New facility service:** Large companies want for marketing reasons to be able to produce their designs rapidly themselves and customize them if the customer so desires. A 3-D printing service will therefore be a must for such companies. Also there will be developments in the supplier market, and 3-D printing houses with advanced equipment will be able to offer their products and services.
- **Marketing tool:** Presently companies often use expensive models to price products and services on the market. If we can make a print of a design on the spot that we can also customize further at the request of the customer, the world of marketing immediately starts to look completely different.
- **Catering:** There have already been trials with printing edible materials. Once we are able to print out proteins, that offers many opportunities in the food and thus also in the catering business.
- **Maintenance:** Long waits for parts will no longer be necessary. Just click on the right part over the Internet and print it out. This represents a good outcome for internal facility staff and maintenance companies.
- **Fittings:** Whether it involves an internal relocation for which a new office layout is needed or a new interior design, the 3-D printing capabilities are endless in this area. Luiting: “My new BB Bricks play into this, especially during the change process.”
- **Inventory:** Just-in-time inventory management will play an even more important role — it will in fact

become essential.

- **Procurement process:** Rather than buying finished products, the focus is moving increasingly to the logistics of commodity and service levels of the new 3-D printing houses. The circular economy will play an important role in this.
- **CSR/sustainability:** Through the excellent opportunity for making use of biomaterials it is already possible to make a good contribution to sustainability goals.

### Conclusions

We may not realize it, but we are on the verge of a new revolution with 3-D printing. In this article a few situations have been outlined in which the impact of 3-D printing has already made itself visible. As the developments are moving very fast — in 2014 it is expected that the mass production of 3-D printers will start — we as humans, but in our case certainly as FMs, will have to be aware of the opportunities that 3-D printing will be able to offer. Especially in the fields of building and furnishing, the possibilities are endless. Three-dimensional printing is the next digital revolution, which will be unprecedented. **FMJ**

### RESOURCES ON 3-D PRINTING

- 3-D printing show in London: [www.youtube.com/watch?v=S-E6vRfnijw](http://www.youtube.com/watch?v=S-E6vRfnijw)
- Bas Luiting's 3-D printer: [www.ultimaker.com](http://www.ultimaker.com)
- Bas Luiting's website: [www.bb-bricks.nl](http://www.bb-bricks.nl)
- Blog about 3-D printing: [www.3-dprinter.nu](http://www.3-dprinter.nu)
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**Erik Ernst** is a facility professional, owner of Asseveratio and a member of the editorial committee of FMI.

# PROMOTING SUSTAINABLE EMPLOYEE ENGAGEMENT

BY REBECCA BOOTH

It is the goal of every organization to maximize employee performance and organizational productivity. Today's organizational effectiveness is defined by sustainable employee engagement that leads to peak performance, resulting in maximum productivity. Consequently, understanding how the workplace environment can promote and support sustainable engagement is increasing in importance.

The greatest value of the built environment is reached by aligning the effectiveness of the people and the efficiency of the space. Although research has established that workplace features can have an indirect impact on employee performance, the cost/benefit effect has not been adequate to justify workplace improvements as a means of improving productivity.

## Job satisfaction and performance

In the past, organizations relied heavily on job satisfaction feedback to understand employee needs and improve

performance; some organizations continue to do so. Through the use of employee satisfaction and opinion surveys, organizations can gain insight on perceived problems, program success, culture and leadership. They can use that information to understand needs and target areas that may improve performance.

However, the direction, cause and effect of job satisfaction on performance is not clearly understood.<sup>5</sup> Therefore, using them as the sole means to improve business results is unreliable. A highly satisfied employee does not necessarily lead to financial results for the organization. Further support is offered by "Hertzberg's effect" which states that dissatisfaction with the workplace contributes little to job satisfaction as does the absence of gratifying job characteristics.

## Job satisfaction linked to sustainable engagement

Job satisfaction is a component of employee engagement and can be used to identify and fulfill employee needs,

improving wellbeing. Additionally, there is research evidence linking emotional wellbeing with work performance.<sup>5</sup>

## Employee engagement

Employee engagement is defined as the enthusiasm and involvement in work that functions in a way that furthers the organization's interests. Sustainable engagement describes the intensity of employees' connection to their organization.<sup>14</sup>

Organizational psychologist Wilmar Schaufeli states that engagement is a positive, fulfilling, work-related state of mind that is characterized by dedication, absorption and vigor.<sup>12</sup>

- **Dedication:** The level of employee commitment to achieving work goals (being engaged)
- **Absorption:** The access to internal support, tools and resources (being enabled)
- **Vigor:** A work experience that provides a heightened sense of wellbeing (feeling energized)

## Measuring employee engagement

Performance management consulting companies offer engagement surveys as a means of measuring employee engagement. Although there is a wide variety of surveys (e.g., Gallup, Towers Watson, Institute for Employment Studies, Society for Human Resource Management) the common measurement themes include:

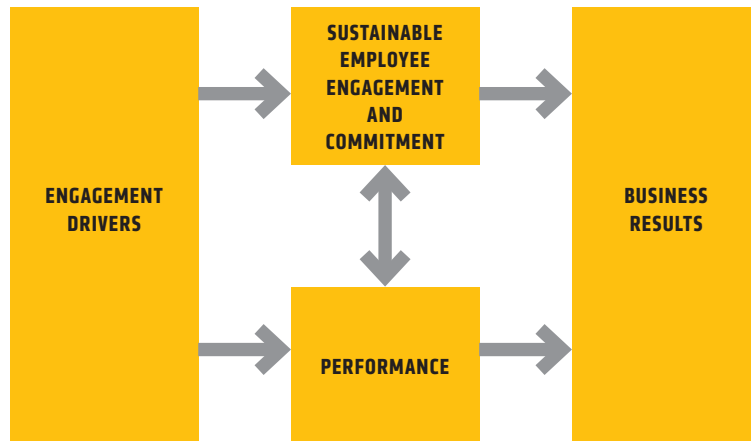
- Ability to contribute and receive feedback from manager
- Opportunity/ability execute inspiring work
- Recognition for accomplishments
- Valued feedback
- Manager encouragement and support for development
- Job/employer satisfaction
- Organizational pride and connection
- Manager/colleague cooperation
- Advancement potential
- Commitment/effort

The feedback from these surveys can be a reliable means of identifying areas of employee engagement weaknesses and providing insight on where to implement strategies for improvement.

## Value of engagement

Employee engagement has been shown to have a significant impact on business results. Some examples include:

- Gallup<sup>4</sup> worldwide research of 49,928 business units within 192 organizations revealed 21 percent higher productivity and 22 percent higher profitability in organizations with high engagement when compared with those with low engagement.
- Forbes magazine<sup>3</sup> published financial results based on 28 studies indicating the beneficial effect that engagement has on business, including increased revenue, higher earnings per share and shareholder return, improved employee retention and reduced employee turnover and absenteeism.
- Towers Watson<sup>14</sup>, as a result of its study of 50 global companies, revealed a 27 percent difference



in operating margin between organizations with high and low employee engagement levels.

## Physical environment and performance

Some workplace research that has been influential in establishing employee control of workspace through environmental control and physical adjustability is related to:

- Communication improvements and environmental satisfaction impacts.
- Space variety/flexibility on job satisfaction and group cohesiveness.<sup>8</sup>
- Effects of privacy on performance and job satisfaction.<sup>13</sup>

These studies were successful in identifying workplace features that contribute to performance by developing individual value together with community support. Although these findings provide a valuable link between the physical environment and performance, the impact is only 3 to 5 percent. It is difficult to convince an organization to invest significantly in the built environment as a means of improving performance for such a slight impact. A more persuasive approach would include a combination of individual value and community support, workplace features with the potential to increase the impact on performance.

Utilizing sustainable engagement as a guideline by which to correlate these

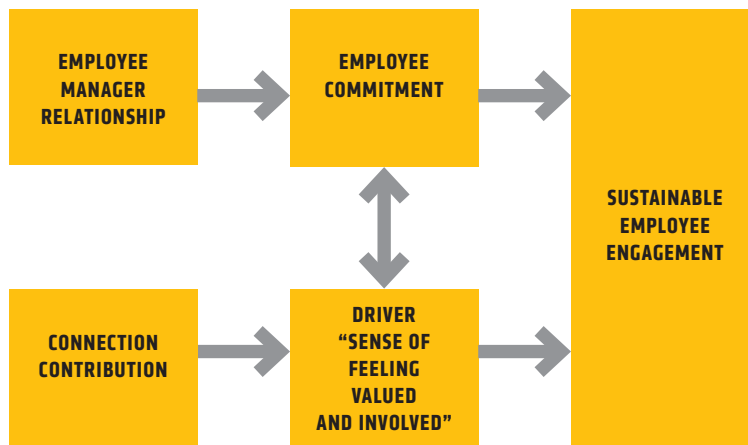
workplace features further strengthens the probable effect on performance.

## Engagement drivers

There as many as 300 drivers of employee engagement identified by various performance management consulting companies. Communication, innovation, flexibility, problem solving and development are some of the most impactful drivers.

Some of these drivers, such as salary and benefits, are incentive based. Others, such as optimism and autonomy, exist as personal resources. Incentive-based drivers and personal resources cannot be significantly influenced by the physical environment. The remaining drivers can be strengthened by the physical environment through its support of communication, innovation, social interaction and wellbeing. The organizational culture and leadership practices drive and influence these resources, but the conditions and workplace features encourage the opportunity of connection and contribution of employees.

Community support is offered through a focus on culture along with the influential drivers of sustainable engagement, “relational aspects of the work experience.”<sup>14</sup> Leadership is consistently identified as a leading driver of employee engagement. The manager-employee relationship is the strongest influencer of employee commitment. Employees need to share their



GOOD INTERNAL COMMUNICATION AND A CULTURE OF INNOVATION ARE CRITICAL FOR IMPROVING ENGAGEMENT.

opinions with their managers, have the opportunity to be involved in decision making and contribute valuable feedback to the organization.

Providing this connection and encouraging contribution provides support for the strongest driver of engagement, as identified by the Institute for Employment Studies, “the sense of feeling valued and involved,” which provides individual value to the employee. When organizations provide favorable treatment, employees feel that the organization cares about their contributions and values their wellbeing, which motivates them to reciprocate with strengthened affective commitment, enhanced performance, increased citizenship and decreased withdrawal.<sup>11</sup>

### The physical environment and engagement

People share a common need to be valued and rely on relationships to nurture, develop and satisfy that need. Sustainable engagement is attained by fulfilling that need. A workplace that supports visibility, interaction and collaboration nurtures the “relational aspects of the work experience” by instilling a sense of community that leads to a “sense of feeling valued and involved.” A work environment should inspire and support daily interactions and experiences for employees.

### Innovation

These core elements should exist in an energized environment that supports

emotional and physical wellbeing. Pride in the workplace can enhance employee dedication and cultivate a “sense of feeling valued and involved.” Workplace design can allow for better absorption by supporting visibility, opportunities for interaction and work feedback through collaboration. An energized workplace offers features that support choice and free flow of information which can drive innovation.

### Communication

Good internal communication and a culture of innovation are critical for improving engagement.<sup>1</sup> Communication also facilitates cooperation within an organization that supports a “sense of feeling valued and involved.” The theory that better communication can be supported by office design was popularized by the concept of office landscaping (German Quickborner team).

This concept promoted open-plan design to enhance lines of communication between groups by determining the office layout based on the paper and visual communication flow between individuals and groups. Technology enables mobile communication and external collaboration. Brand reflection throughout the workplace reinforces the communication of organizational mission and purpose.

**Workplace support:** *Open office, visibility, telework, hoteling, adjacency, collaborative areas, meeting areas, support spaces, open stairways, branding, video conferencing and Web-ex capability.*

### Collaboration

The research of Levinson<sup>9</sup> indicates that collaborative leadership styles within an organization drive engagement. Collaboration encourages teamwork, feedback, brainstorming and idea creation which in turn drive innovation. Visibility is required to support comprehensive communication by offering the ability to enhance the communication experience with verbal and nonverbal cues.

In a Cornell University research study<sup>6</sup> the following workplace features were studied as a means of collaboration: workstation type, partition height, density, proximity, floor plan openness and meeting/collaboration space ratio. The study revealed a correlation between these characteristics and variables on the employee perception of being “well-informed about the current activities in the department” and reinforced a “clear idea of future development steps of the department.”

Workplace design that increases the possibility of serendipitous encounters increases the probability for informal interaction, feedback and exchange of information. This condition can be accomplished by strategically interspersing collaborative, support and service spaces among workstations. This research offers strong evidence that workplace support for collaboration drives a “sense of feeling valued and involved” thereby promoting the “relational aspects of the work experience.”

**Workplace support:** *Shared spaces, collaboration space, mobility, workspace variety, proximity, visibility, partition height, openness, density, video conferencing, external connective capability and convenience of support/service spaces.*

### Wellbeing

Provision for employee wellbeing is likely to lead to higher levels of engagement. Wellbeing can be supported emotionally and physically. A recent Gallup study<sup>4</sup> suggested that optimizing remote work at 20 percent yielded the highest engagement levels contributing to an ideal work-life balance. An emergent standard of environmental conditions that enhance human health and wellbeing is well building certification. The certification defines healthy environmental features for light, nourishment, water, air, fitness, mind and comfort. Additionally, there is recent research supporting the performance and financial impacts of these features.<sup>15</sup>

### Emotional wellbeing

Emotional wellbeing is strengthened through “relational aspects of the work experience.” A supportive social environment promotes wellbeing.<sup>10</sup> Optimal emotional wellbeing is best supported with workplace conditions that promote interaction and the ability to socialize along with support for individual autonomy. Balanced workplace design offers a variety of work settings to accommodate the need for isolated work or interaction with the convenience of transition. Exposure to daylight views along with accommodations for privacy and concentration contribute to emotional wellbeing. Wellbeing heightens the ability to maintain energy, enthusiasm and work accomplishments that promote a “sense of feeling valued and involved.”

### Physical wellbeing

Physical wellbeing is supported by work conditions. A “sense of value” is ultimately supported with work design support for safety and healthy physical ability. Ergonomics are significantly related to physical ability of work design.<sup>7</sup>

Business Goal	Workplace Strategy	Design Concepts
Improve communication access and collaboration between team members	Increase visibility and opportunity to exchange information	Improving departmental adjacencies by relocation
		Lowering panel height to increase visibility and communication
		Locating workstations along central pathways to increase opportunity of encounters
		Clerestory on offices
		Creating small conference tables within the workstation environment to allow for informal exchange of information
		Place whiteboards with gathering space to allow for group collaboration and ability to illustrate/explain

Workplace features including ergonomic chairs and adjustable keyboards improve the physical ability of work design. Proper ventilation systems have an impact on indoor air quality and affect physical wellbeing. Workplaces with offerings that encourage physical health such as open stairwells and fitness centers can enhance physical wellbeing.

**Workplace support:** *Sense of community, social spaces, exposure to daylight and views, flex time, mobility, open staircase, support for privacy/concentration, ergonomic furniture, comfort, air quality and fitness.*

### Social interaction

Work design researchers agree that employees’ experiences and abilities to carry out their work are heavily influenced by their access to social support.<sup>14</sup> The social context of work can play a critical role in shaping employee experiences and behaviors. The research of Morgeson and Humphrey has given renewed attention to the relational

perspectives in work design theory and research. The research gives a strong value to social support, external interaction, initiated interdependence and feedback from others.

### Club concept supports an energized work environment

The future workplace will need to accommodate for instantaneous and free-flowing information that has the potential to greatly improve creativity and productivity. Responding with support of these needs is a catalyst to establishing sustainable engagement within an organization.<sup>14</sup>

The club concept offers a variety of work settings that can accommodate versatile activities and needs. The club work environment offers support for a combination of interactive and autonomous work settings. It also encourages interaction and movement which generates energy. A club workplace environment supports the “relational aspects of the work experience” with a

combined support for social interaction, communication and collaboration.

The value of this environment is not limited to facilitating the connection and contribution that fulfills the “sense of feeling valued and involved.” This supports sustainable engagement in an energized environment with the potential to achieve peak performance resulting in improved business results. With the research supporting such evidence and resulting in a 21 percent impact on productivity,<sup>4</sup> this warrants future workplace design providing a physical environment that promotes sustainable engagement.

### Substantiating the role of the physical environment in promoting sustainable engagement

A financial investment in the physical environment that supports sustainable engagement holds the potential to improve human capital performance and result in improved productivity, substantiating a required rate of return on investment. Applying an employee engagement methodology to workplace design involves:

- Exploring employee engagement data prior to workplace design provides insight on barriers, employee satisfaction and areas of weaknesses. Utilizing this data as a point of reference in measuring the effect of workplace improvements on employee engagement and performance.
- Using the research of organizational psychology as a guideline to originate effective workplace design and provide a best practice approach to improve human capital.
- Researching and substantiating the effect that the physical environment asserts in influencing the theories of organizational psychology.

Sustainable employee engagement offers extensive value to individuals, organizations and industries. The human capital significance of a heightened

sense of value, wellbeing, connection and satisfaction benefits the individual as well as the organization. The effect that sustainable engagement has on the key performance indicators to drive productivity, and ultimately profitability, is critical to the success of any organization. **FMJ**

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