FMJ | OFFICIAL MAGAZINE OF IFMA | MARCH/APRIL 2021 | THE RISK MANAGMENT + HEALTH & SAFETY ISSUE

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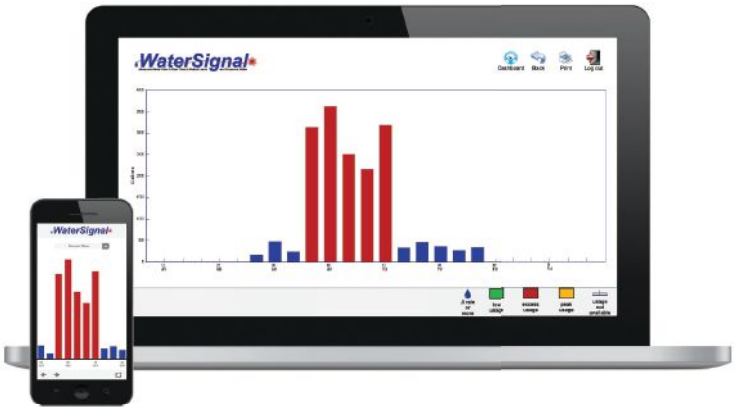

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PLEASE NOTE: Materials offered by IFMA to prepare for the CFM Exam, such as the CFM Exam Prep Workshop, the FM Learning System, and CFM practice exams, are optional study resources and are not a requirement of eligibility nor are they endorsed by the IFMA Certification Commission.

Features

Sections

IFMA

ABOUT IFMA IFMA is the world's largest and most widely recognized international association for facility management professionals, supporting 23,000 members in more than 100 countries. This diverse membership participates in focused component groups equipped to address their unique situations by region (142 chapters), industry (16 councils) and areas of interest (six communities). Together they manage more than 78 billion square feet of property and annually purchase more than US$526 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 series of facility management conferences and expositions. For more information, visit www.ifma.org.

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ON THE GO? FMJ can be viewed on your mobile device, so you can get your FM content fix anywhere, anytime.

FMJ Extras

The online version of FMJ features extra resources like videos, podcasts, white papers and more to enhance your reading experience. Click on the FMJ Extra icons that appear in the digital magazine to link to additional sources of information to learn more about topics covered by articles in this issue.

FMJ Extended

Check out the online issue of FMJ for a special section that follows the end of the print magazine and includes additional articles not available in the print edition. Read the extra articles listed below for contributions from councils and communities, and other supplementary content.

Editor's Note Bobby Vasquez

A recent ABC News report on the fluctuating return-to-normal timeline stated, "There is a new normal, and no one wants to talk about it." Not necessarily. The facility management industry has been talking about it for the better part of this past year.

FMs have had to create their own timelines and interpretations of "normal" for building maintenance, reentry and reopening. When the world hit the pause button, facilities and FM hit fast-forward. HVAC, elevators and power plants did not patiently wait for occupants to return. Water systems, fire suppression and safety equipment did not maintain and recertify themselves. Employees did not wander back to the office without a list of health and safety protocols.

Despite conflicting views on when (and whether) we can return to life as we once knew it, FM remains in the forefront of ensuring normalcy in facility functionality.

This issue of FMJ examines the ongoing FM to-do list regarding health and safety protocols compounded by the pandemic. Areas such as the janitorial closet that were once an afterthought are now among the most important places in a facility. (Page 24)

How long will this phase of reentry last? Will it evolve into higher occupancy? Will it regress to very limited or total closure? Until those questions and scenarios can be answered, there are ways for FMs to optimize their facilities for low occupancy. (Page 20)

Building security is the front line of prevention from nuisances, trespassing and unimaginable tragedy. Many FMs and personnel who oversee security must now enact procedures to ensure no one who has or potentially has COVID-19 enters their facilities. Guarding against the pandemic has to be a part of standard FM security assessments. (Page 44)

This issue also features two case studies that examine incredible collaboration. A top oil company in Taiwan established business continuity plans following government guidelines, and since then has managed to fend off viral attacks and kept its employees safe. (Page 66)

So much information is at our fingertips. When we need information, we simply "Google it." What happened when Google needed to position its FM team to face the challenges ahead? They IFMA-ed it. On Page 62, the IFMA Foundation discusses a partnership with Cushman & Wakefield, California Community Colleges and the San Mateo Community College District to upskill and strengthen FM teams at one of the world's most innovative companies – just one of the many ways IFMA and the Foundation work to educate and advocate for one of the most important and underappreciated professions and its practitioners.

The road ahead will be bumpy, and we never know what kind of life-changing event is around the corner. However, as long as FM keeps talking about what no one else wants or feels the need to talk about, organizations and their personnel and visitors will be ready.

Cheers!

Interested in writing for FMJ?
Email **bobby.vasquez@ifma.org** article ideas to be considered for future issues of FMJ.

From the **Chair**

PETER ANKERSTJERNE

MBA, COP, FRICS, IFMA FELLOW

Chair, Board of Directors

Many organizations place executive responsibility for risk management with the finance team or with a dedicated risk management function. However, facility operations are a common thread for all manner of risks to the business and its operations, workplace design, IT-infrastructure, communications, workforce and visitor management, etc. FM participation in review of risks has never been more important. In an increasingly complex world, we expect that more than a third of the workforce will continue to work at home at any given point in time. This means we are now facing new kinds of formal and informal touchpoints which the worker has with the company. There are potential inherent risks virtually everywhere. The real challenge for FM is the diverse array of risks we need to take responsibility for, regardless of our current job definitions. Common risks which we, as facility managers, have been dealing with for years have focused on:

- IT security risks
- Contractor management risks
- Financial risks
- Operational risks
- Brand and reputational risks
- Emergency preparedness risks

With a changed working environment in the post-vaccine COVID-19 era, we will now also need to include work-from-home and third places as part of our responsibilities and establish new risk mitigation procedures to keep people safe, healthy and well.

Health, safety and well-being require a renewed level of attention.

What's going to keep us, as well as the CEO, awake at night is the uncertainty that we are not in control and not knowing if we have the right processes and procedures to keep people safe while in our facilities. This has been a big issue during the social distancing and increased hygiene measures we installed over the last 12-14 months. Now, this will increasingly have to include home offices.

When considering health and safety risks, we must make sure that any potential hazard is addressed on a timely basis by qualified staff. Having specified procedures in place and systematically recording all actions taken can help mitigate risk should incidents occur resulting in legal action.

Ensuring safety inspections occur across all relevant locations is an important FM task for which we can take advantage of the latest technology to minimize and manage risks, and guarantee our contractors are appropriately trained and understand all the relevant health and safety protocols and emergency routines.

There are various risk factors inherent in virtually any company, and they impact the entire organization and their FM teams. By understanding potential threats and implementing the mitigation strategies and actions needed, FMs can reduce, minimize or eliminate risk. But we cannot do it alone and we will have to rely on other departments, such as HR, HSE and legal to manage the threats of the future, including both the physical and mental health and well-being of the workforce.

Our ability to keep people safe and healthy within the buildings we serve – both to reduce any injuries (like trips, slips and falls) and insurance liabilities or legal claims is important and the right thing to do. No person should ever get sick or injured by going to work – not on our watch.

We must stay informed on key risk management procedures. I encourage you to stay updated on the latest safety training and documentation within your organization and through IFMA. We, as facility managers, can provide a real difference in keeping people safe by incorporating relevant control measures that will reduce risk for the benefit of the business and especially for the benefit of people who work with us.

From the **President**

DON GILPIN

President & COO
IFMA

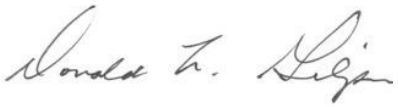
As the world was coming to terms with the sheer magnitude of the COVID-19 pandemic this time last year, a major milestone in environmental awareness and reform came and left without the fanfare it truly deserved.

Earth Day 2020 marked the 50th anniversary of an annual event that champions stewardship of our planet's resources. First organized in the United States by environmental advocates, Earth Day has become the world's largest civic event. This April 22, it is my hope that politics, skepticism and/or indifference can be set aside; that we can open our ears, eyes and minds to the serious issues that threaten our natural environment. Humankind has a responsibility to protect our shared home and treat with respect and care those we share it with.

My family spends some time in a northern Michigan, USA, community that demonstrates true devotion to a crystal-clear lake and hundreds of square miles of pristine pine forests. It is common to see boaters, hikers and other members of this community picking up and disposing of trash found on the water, shorelines or trails. You won't find any special logos on their clothing that connects them with a specific cause or political affiliation; just a shared love and respect for our natural resources, a collective pride in the beauty of their surroundings and a communal effort to limit the impact made on the environment. Common practices in this community include using no fertilizers or pesticides, embracing policies that enforce energy-efficient engines and broad-based recycling.

This micro example of a shared regard and responsibility for Mother Earth is what Earth Day is about. In addition to throwing my full support behind Earth Day, I have also begun a relationship with a global cause called the Circular Economy Club. My hope is to include IFMA in the conversation that the Circular Economy Club is leading and find a voice for the FM who will most likely be responsible for the repurposing of close to 100 percent of resources used in the built environment. The overarching theme of the Circular Economy Club is that we never really throw anything away. Irresponsibly discarded resources end up in our landfills, in the air we breathe, in our oceans – and even that beautiful crystal-clear lake in northern Michigan that I love so much.

Earth Day began in response to a devastating oil spill off the coast of California, USA. As the story goes, Wisconsin Senator Gaylord Nelson was flying overhead when he saw the 800 square-mile oil slick from his airplane window. It was the impetus – and perhaps the proverbial straw – for the creation of Earth Day. Firsthand experiences have a powerful effect. If each of us took a moment to not only see what's outside our window but do something about it, we could be the story that future generations would reference on Earth Day's 100th anniversary. Wouldn't that be cool?



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CFM® EXAM NOW OFFERED AS LIVE REMOTE PROCTORED EXAM

Driven by IFMA's Certification Commission and with approval from the American National Standards Institute (ANSI), the Certified Facility Manager® (CFM®) exam is being offered virtually, giving CFM candidates the option of taking a live remote proctored exam.

In view of pandemic-related risks and lockdowns, and to ensure that professionals worldwide have access to the exam, IFMA and its testing and assessment provider Prometric partnered to deliver live remote proctoring, starting in February of this year. The CFM application and scheduling processes remain the same – the only change is selecting an on-site or online test.

Prometric has ensured that remote testing is as reliable and secure as sitting for the exam in a testing center. A detailed user guide outlines steps candidates must take before the test begins. After showing proof of identity using a webcam, test-takers are guided through three security checks by a Prometric Readiness Agent via webcam, including a 360° view of their environment, a scan of their work surface and a standing personal scan, which checks sleeves, pockets and glasses.

"This new testing option continues to support the growth of the CFM globally," said Dean Hitchcock, Chairman of the Certification Commission. "It attests to IFMA's commitment to meet FM professionals' educational and career-advancement needs, especially when safety is a priority. We recognized and responded to the need for flexibility and convenience in sitting for the exam."

Those who prefer to sit for the exam at a testing center can be assured of health and safety protocols. Prometric worked with third-party experts, including epidemiologists from John's Hopkins University, to enhance test center procedures that minimize the risk of transmission and protect test takers and staff.

Visit prometric.com/ifma and select "Schedule" under "Remotely Proctored Exam."

Planon appoints Peter Ankerstjerne as Chief Strategy Officer

In February, IFMA Chair Peter Ankerstjerne, MBA, COP, FRICS, IFMA Fellow joined the Planon Group as Chief Strategy Officer, widening the company's experience and network within the international workplace and facility management market. Ankerstjerne will be responsible for leading Product Strategy and Innovation, Strategic Partnerships, Marketing and Communications.

"Peter's broad experience within our domain will be a valuable contribution to Planon's journey to lead the global smart building market," said Pierre Guelen, CEO and founder of the Planon Group, an IFMA Corporate Sustaining Partner.

IFMA seeks advocates and influencers for enhanced online presence

In an effort to amplify IFMA's reach, while also helping members and component groups build visibility and reputability online, IFMA is curating fresh industry news and association updates via Bambu, a software application that makes it easy to access and share content across social media channels.

IFMA's community includes industry thought leaders and key influencers who drive and support awareness of facility management and the association. Whether creating or sharing content on social media, these prolific posters constantly seek relevant material to consume and circulate. By becoming an IFMA advocate, members, volunteer leaders, even FM influencers outside the association can use Bambu via desktop computer, mobile app or email to read curated stories specific to their roles in the association; then share materials with their networks on Facebook, LinkedIn and Twitter.

Participating in IFMA brand advocacy is a small way to make a big difference. If you are interested, please email marketing@ifma.org.

John Carrillo and Don Gilpin join Global FM board

Immediate Past Chair of the International Facility Management Association (IFMA) John Carrillo, CFM, IFMA Fellow began his two-year term in February as chairman of the Global Facility Management Association's (Global FM) board of directors. He moves into the role following Duncan Waddell, who served as chairman for eight years.

In addition to welcoming three new member organizations to the federation – the Panamanian Association of Facility Management (APAFAM), the Egyptian Facility Management Association (EGYFMA), and the Turkish Facility Management Association (TRFMA) – Global FM announced the following additions to its board: IFMA President and COO Don Gilpin; TRFMA Chairman Gökçenur Çelebioğlu; TRFMA General Secretary Altınay Gökşin; APAFAM Chair Manuel Humberto Medina; and Sherif Maged of EGYFMA. Ali Alsuwaidi of the Middle East Facility Management Association (MEFMA) will serve a two-year term as vice chair.

"COVID-19 trends are driving significant changes in business survivability plans, spatial designs, sustainability and wellness priorities. Out of necessity, our industry must innovate. This requires industry leaders to pool resources and turn ideas into solutions to prepare for and adapt to the future of the built environment," said Carrillo. "Global FM has the outreach platform to work with private and public entities, along with academia and other service providers to provide the knowledge and tools required for FM practitioners."

Established in 2006, Global FM is a federation of facility management associations, of which IFMA is a member, operating as a single, united entity to promote FM and act as a conduit for furthering the knowledge and understanding of FM.

WORLD FM DAY 2021 FOCUSES ON "CELEBRATING FM: STANDING TALL BEYOND THE PANDEMIC"

Since 2008, World FM Day has placed a spotlight on the essential work of the facility management industry worldwide. FM's role in operating and maintaining critical infrastructure has been widely recognized this past year. FMs have been crucial to the continued operation of hospitals, research centers, government buildings, food distribution networks and other facilities necessary during the COVID-19 response. If these buildings shut down or are impacted operationally, so too is a community's ability to meet the crisis.

With the purpose of raising the profile of the profession, World FM Day encourages facility professionals worldwide to engage individuals, companies, associations and partners in celebrating the important contributions of FM to the built environment and the global economy. This year's event is scheduled for May 12; however, many chapters, councils, communities, companies, teams, associations and individuals plan activities throughout the week.

WORLDFMDAY

CELEBRATING FM – STANDING TALL BEYOND THE PANDEMIC

12 MAY 2021

Do you have an example of a colleague or teammate whose circumstances or response to the pandemic were extraordinary? How have you or your fellow FMs persevered and what are your priorities moving forward? Start collecting your stories to share this May in recognition of FM's resolve and responsibility to stand tall during the pandemic and beyond.

Visit worldfmdayinfo.ifma.org for ideas and updates leading up to the event.

IFMA'S WORLD WORKPLACE 2021 CONFERENCE AND EXPO RELOCATES TO FLORIDA THIS OCTOBER

With ongoing uncertainties surrounding the COVID-19 pandemic, as well as fluctuating regional and corporate travel policies, IFMA has relocated World Workplace 2021 from Anaheim, California, USA, to the Gaylord Palms Resort and Convention Center in Kissimmee, Florida, USA.

Held Oct. 26-28, 2021, World Workplace activities and attendee accommodations will be self-contained in a single venue for the safety, convenience and peace of mind of all attending. Between IFMA and the Gaylord Palms Resort (a Marriott International property), more than 200 cleaning, health and safety protocols will be observed on site. As part of Marriott's Commitment to Clean, the Gaylord Palms Resort adheres to rigorous cleaning practices. Its multipronged approach to the health and safety of guests and staff will be combined with IFMA's on-site event protocols.

The venue is about 19 miles from the Orlando International Airport and just minutes from Walt Disney World® and Universal Orlando Resort™. Local theme parks, attractions and other businesses are working closely with medical experts to ensure a safe travel experience.

World Workplace will resume full conference programming, including educational sessions, keynote speakers, a welcome reception, the expo, education arenas and IFMA's Awards of Excellence presentation. This year's conference will also offer a new schedule format that allows attendees to jumpstart their educational experience on the first day.

Those arriving early can register for a CFM® Exam Prep Review or Deeper Dive sessions on Monday, Oct. 25. The official welcome and opening keynote speaker start at 8 a.m. on Tuesday, Oct. 26, immediately followed by a day of concurrent educational sessions. The expo hall will be open Wednesday and Thursday; and the conference concludes on Thursday, Oct. 28, following the Awards of Excellence and closing keynote speaker.

"We are eager to reconvene in person for our flagship event," said IFMA President and COO Don Gilpin. "While we still cannot predict what level of normalcy our world will be in six months from now, we are confident in the Gaylord Palms' ability to provide a clean and safe setting for World Workplace; and with everything we've learned this past year about responsible building reentry, IFMA can assure everyone who wants to attend that all necessary health and safety measures will be taken and upheld."

Visit worldworkplace.ifma.org for pricing and program information.

Earth Day: April 22, 2021

Join IFMA and more than 1 billion global participants in taking action to Restore our Earth™

In 1970, the first Earth Day started an environmental movement that has unified and mobilized millions of people, launched legislation, and motivated activities and programs to support and sustain a healthy planet. Today, 192 countries engage annually in Earth Day activities — many coordinated by the Earth Day Network (EARTHDAY.ORG), the largest recruiter to the environmental movement — making it the world's largest civic observance.

This year's Earth Day theme, Restore our Earth, focuses on emerging green technologies and innovative thinking that can restore the world's ecosystems, create a green-jobs-ready workforce, forward a green consumer movement and strengthen civically engaged communities.

The Earth Day Network works globally to drive meaningful action across the following five issues — all of which impact or are impacted by the facility management industry.

1. CLIMATE ACTION

Bracing for threats that climate change poses to the built environment is not an overreaction to an unseasonably hot day. Scientific evidence for rising global temperatures is undeniable. Failing to prepare property and people for environmental extremes can become a disastrous and costly oversight. FMs must act now to adapt buildings for safety and resilience and create focused plans for varying climate change realities.

2. SCIENCE AND EDUCATION

By understanding the science behind climate change, FMs can anticipate and mitigate facility risks and contribute to reducing future impacts. The Earth Day Network believes that climate literacy holds the key to solving the climate crisis. The FM industry knows that having a sustainability mindset is vital to meeting the growing demands of organizations focused on operational excellence and social responsibility.

> *"I am convinced that competitiveness in the 21st century will increasingly be linked to the quality of environmental literacy among a nation's citizens."*
>
> ~ Kathleen Rogers, President, EARTHDAY.ORG

3. PEOPLE AND COMMUNITIES

FMs are expected to take steps to protect the environment and the people who use their facilities. While an FM's focus is on the facility itself, every action, strategy, process and plan is meant to support, protect and engage the people inside. FMs can lead their organizations and communities toward a zero-carbon future, moving toward electrification and away from fossil fuels.

4. CONSERVATION AND RESTORATION

FMs design workplace and site management policies and practices to preserve, protect and restore buildings, grounds, habitats and the environment. IFMA's World Workplace 2020 keynote speakers Céline and Fabien Cousteau stressed that protecting our ecosystems is about protecting us and recognizing that "our planet is the only reason we exist."

5. PLASTIC AND POLLUTION

In addition to killing marine life, plastic pollution in our waters negatively impacts coastal communities and economies. The obligation of assessing and minimizing the overall effects of a facility on the environment is on FM. It is more important than ever to ensure that the collection and disposal of waste is sustainable.

Climate action around the world

To address climate change both at home and abroad, the U.S. government is building on executive actions enacted in January, including reentering the Paris Agreement. The U.S. will host a Leaders' Climate Summit on Earth Day, April 22.

Ahead of this November's United Nations Climate Change Conference (COP26) in Glasgow, Scotland, summit organizers are creating momentum among organizations and individuals across the U.K., including:

- **Race to Zero,** a global campaign to rally leadership and support from businesses, cities, regions and universities for a healthy, resilient, zero-carbon recovery.
- **Count Us In** aims to mobilize 1 billion people over the next decade to take practical steps to reduce their carbon impact.

Addressing global challenges such as poverty, inequality and climate change, the United Nations Sustainable Development Goals (SDGs) are a call to action to promote prosperity while protecting the planet.

> *"The U.N.'s SDGs recognize that ending poverty must go hand-in-hand with strategies that build economic growth and address a range of social needs, while also tackling climate change and environmental protection. Choose what you are passionate about and endeavor to make a difference, big or small. Start where you are, use what you have, do what you can."*
>
> ~ Dean Stanberry, CFM, LEED AP O+M, IFMA Board of Directors Second Vice Chair, ESUS Community Chair

Earth is our facility. Humans are its FM team.

The range of social, economic, environmental and health challenges we face as a people is staggering. We can't fix everything, but we can commit to do something.

As sustainability champions, FMs worldwide have the opportunity and expertise to guide our organizations toward practices, projects and performance that directly improve the environmental, social and economic bottom lines. Sustainable best practices are hardwired into FM operations and strategies; and sustainability support, education, tools and recognition and are hardwired into IFMA.

COMMUNITY

IFMA's Environmental Stewardship Utilities and Sustainability (ESUS) Community drives the FM sustainability agenda on a global scale. **esus.ifma.org**

EDUCATION

As business leaders step up corporate response to the global sustainability agenda, FMs are being asked to lead and carry out environmentally sound strategies. IFMA's sustainability eLearning course is a self-paced deep dive into sustainable energy, water, waste and workplace management practices. **bit.ly/64225FMJ**

RESOURCES

Visit IFMA's Knowledge Library for guidance on establishing, communicating and measuring sustainability programs in your facilities. **bit.ly/KLFMJ**

CREDENTIAL

IFMA's Sustainability Facility Professional® (SFP®) credential program is designed to help you increase efficiency, think strategically, improve your company's performance, and gain credibility as an informed champion with a unique sustainability skill set. **bit.ly/SFPFMJ**

SCHOLARSHIP

Through the generosity of IFMA Fellow Eric Teicholz, the IFMA Foundation offers a scholarship opportunity to young professionals with a demonstrated financial need who are interested in earning the SFP credential. Applications are due by July 16, 2021. **bit.ly/SchoFMJ**

REPORTS

- "Climate Change Fundamentals for FM Professionals" reduces 3,000 pages of scientific evidence to 30 pages of key points for understanding and preparing facilities for the threat of climate change. **bit.ly/FMJclimate**
- "Adapting to Climate Change for FM Professionals" provides resources to assist FMs in reducing vulnerability to the effects of climate change for the organizations they support. **bit.ly/FMJadapt**
- "The Experts' Assessment: The Workplace Post-COVID-19 In-depth Analysis" assesses the current challenges and future priorities to help organizations prepare for a new status quo, including sustainable development goals for the workplace. **bit.ly/FMJexpert**

RECOGNITION

IFMA recognizes sustainability achievement through the Sheila Sheridan Award for Sustainable Facility Operations and Management. This award encourages, rewards and recognizes excellence, leadership and innovation for the operation of environmentally responsible and sustainably managed buildings. Nominations are due no later than June 11, 2021. **awards.ifma.org**

Implementing an ISO standard management system in a consultancy company

From conception to process to success

BY **KRISTOF SCHRIJVERS**

Working environments and organizational processes will always be exposed to change and increasing expectations. Therefore, they should be as resilient, resistant and efficient as possible, while also being smart, sustainable, circular and boosting the well-being and productivity of the team members. That is a lot of ground to cover!

A guidance, such as a management system standard (MSS) – a wisdom distilled from experts in their subject matter who know the needs of the organizations they represent – is more than welcome.

DRIVERS

The different drivers toward the implementation of a management system are varied and often activity based. Despite the variety, there are four types of drivers that will determine the path and decision toward the implementation of an MSS.

1 **Future Proof.**
Every organization has a goal of resiliency — to be ready for the future and prepared to address risks and threats. To this end, organizations must become agile and adaptable. Although it may seem counterintuitive, because a management system offers a clear and transparent picture of an organization's culture, governance structure and processes, it enables the organization to respond appropriately when changes are necessary.

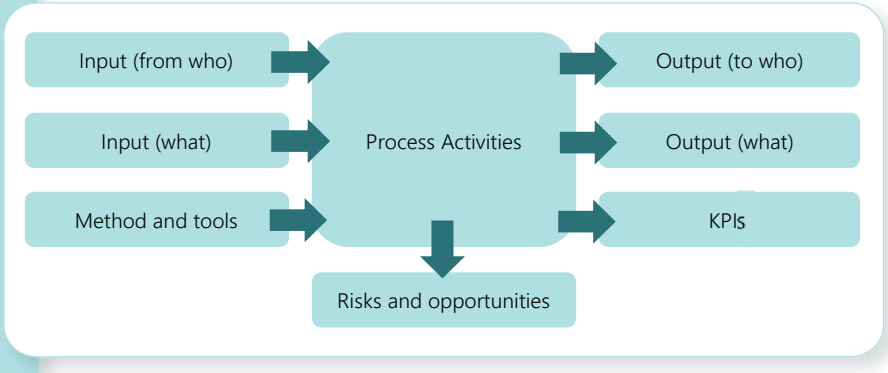
2 **Mandatory.**
Some highly regulated industries, such as pharmaceuticals, food and health care seek a framework such as an MSS to help navigate the complexity of compliance.

3 **Competition.**
Certification is a differentiator in today's world where businesses compete for market share and to attract and retain talent. Certification to an MSS demonstrates transparency, competence and a commitment to quality and continuous improvement ensuring continuity for years to come and fostering trust among its stakeholders — clients and employees.

4 **Values.**
By its nature, implementing an MSS requires a laser focus on the demand organization's mission and vision. It requires transparency by making the organization's processes vulnerable to an independent audit. As a result, the process reinforces the organization's commitment to its mission. It contributes to achieving its sustainability goals, increasing general well-being and shifts toward smart, innovative, more productive and circular organizational cultures and values.

Project Plan

1. Initiation and Orientation
   a. Engagement letter
   b. Implementation plan
   c. Gap analysis
2. Documentation
   a. Address issues from Gap analysis
   b. Change processes/procedures
   c. Adjust implementation plan if necessary
3. Implementation
   a. Implement changes and new procedures
   b. Awareness training
4. Management review
   a. Review of management system
   b. Evaluation of key elements
5. Certification audit (third party)
   a. Document review
   b. On-site audit
   c. Address nonconformities
   d. Certification achievement



THE PROJECT PLAN

The implementation of a management system requires a solid, phased approach, based on a realistic timeline (six to 12 months). An engagement letter to inform employees and stakeholders about the drivers and objectives of the selected management system is a critical success factor. The project plan also describes the scope of the management system and different roles and responsibilities throughout the entire company and beyond (i.e., an external consultant). When the end date of the implementation process is determined, be sure to request the external audit by a recognized accreditation body.

Initiation and Orientation phase

During this phase, the current state of the organizational structure is determined and documented. This phase should be structured by the different clauses of the standard and performed by internal workshops to gather all the information needed. This results in an orientation report containing the company structure and defined processes (steering, executive and supportive), the different types of information, roles and responsibilities, mission and strategy statements, communication lines and reports, different stakeholders and their interests, targets and key performance indicators (KPIs), and opportunities and threats.

The orientation report enables a gap analysis by comparing the information gathered in the orientation phase with the requirements of the standard.

Converting the processes into turtle diagrams is a useful way to visualize existing and possible missing parts of the entire process. It also connects the different processes with each other to reveal the underlying, necessary internal communication lines.

Documentation phase

It is important that the documented information supports the requirements of the standard and it reflects the company's mission and strategy. During this phase, missing documents identified as a result of the gap analysis are created and potential nonconformities are addressed. If necessary, adjust the timeline to ensure sufficient time to complete this phase and to close the gap.

Implementation phase

Most organizational processes are already in place as a result of years of solid work. Implementing findings and recommendations from the documentation phase is often simply completing the puzzle with the pieces already laid on the table. Actions arising after the initial analysis and closing the gaps between the current and desired state can be realized with awareness training and without creating changes or sudden shifts in work ethics. A change may be as simple as adding or changing some bullet points on the agenda of a team meeting or asking that one important extra question to a supplier when evaluating their offer. The basic principles of a management system are expressed in the way one operates, meets, leads, writes, communicates and evaluates.

Management review phase

This phase requires top management to review the management system to ensure continuing added value, adequacy and effectiveness while addressing the possible need for changes to the policy, objectives, targets and other elements of the management system. It is a key document that contains the evaluation of the business plan, KPIs, risk assessment, corrective actions, training and competence, objectives, internal audit results, supplier evaluation and security issues.

Initial Certification audit (third party)

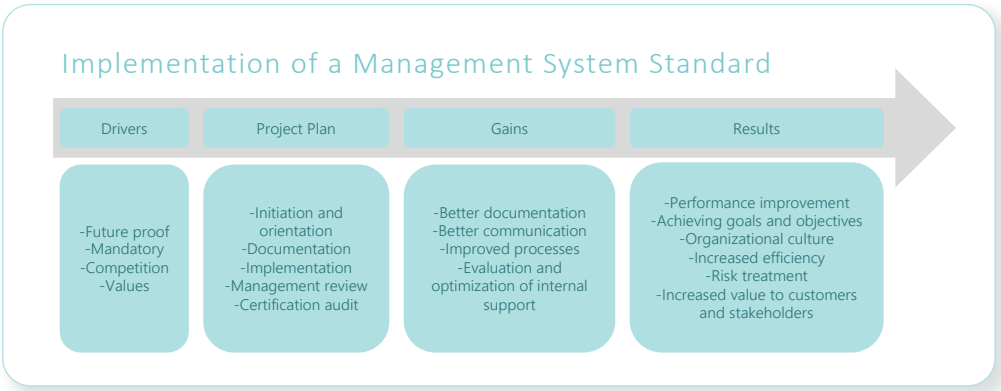
The initial certification phase is twofold: during the first visit (document review), the external auditor assesses whether the organization is ready for an operational audit. The auditor learns about the organization, verifies whether the requisite elements of standard are effectively implemented and formulates the operational audit program. The second part happens a few weeks later. This is when the auditor meticulously evaluates all the processes to see how the management system is translated into day-to-day operations. The auditor will deliver a report containing a summary of nonconformities, strengths and opportunities for improvement. When no major nonconformities are identified and when the minor nonconformities are properly addressed and approved, together with all the audit data, certification is awarded.

GAINS

There are numerous gains during the implementation process of a management system. First, there are the actions taken on the road toward the certification to a management system. These are the low hanging fruits paying off long before the results of the actual audit are achieved and noticeable. For example, the evaluation of documents automatically leads to better document management, resulting in a direct improvement of efficiency and standardization. Items, such as an updated business plan, a new procedure or the discussion of an internal issue can lead to better communication between functional areas. The evaluation of internal support services may lead to an improved ticketing system and follow up. The evaluation of external suppliers leads to updated and improved service level agreements. Defining process related KPIs will lead to improved processes and a closer follow up of the objectives. This is just a snapshot of the gains the implementation process will yield in an organization.

RESULTS

The repeatable steps that are consciously implemented to achieve goals and objectives improve overall performance. It creates an organizational culture that reflexively engages in a continuous cycle of self-evaluation, correction and improvement of operations and processes through heightened employee awareness, leadership and commitment. It results in a more efficient use of resources and improved financial performance as well as improved risk management and protection of people and the environment. Finally, it leads to an increased capability to deliver consistent and improved services and products, thereby, increasing value to customers and all stakeholders.



CHALLENGES

One of the biggest challenges of the implementation of a management system is to have it operational at least three months before the initial on-site certification audit, preferably even slightly longer. This means that the PCDA principle (Plan-Do-Check-Act) must be present in all the documents and evaluation processes. Therefore, it is important to establish a realistic timeline and to get allthe phases in place.

Another challenge lies in the so-called aftercare. Achieving certification is only the beginning of a continuous improvement cycle. After certification, a periodic audit will determine if there are nonconformities and whether the opportunities for improvement were implemented. Then a new cycle begins.

THE PARADOX OF TIME AND BUDGET

The choice of implementing a management system is often prohibited by the idea of too much time and money spent during the process. The truth is that most of the work has already been done and the pieces are lying on the table. It is just a matter of putting the pieces together and getting the mindset right. Costs or time spent are nothing more than an investment with a positive return over time.

WHAT WE DID?
We have successfully implemented two MSS (ISO 90001 and ISO 27001) simultaneously within six months.

Kristof Schrijvers *is consultant and QA responsible for PROCOS Group. He was a facility manager with more than a decade of experience in several different environments and uses his experience to consult with private companies and government agencies. He has a master's degree in engineering and science, and it is his passion to convert data into knowledge to align business objectives and employee needs with facility, asset and other management systems. Schrijvers has successfully implemented multiple ISO 9001, 14001, 27001 and 45001 management systems, covering areas as quality assurance, environment and sustainability, information security, and health and safety. He is also a member of ISO/TC 267, Facility management, and chair of the VOKA network for Facility Management in Belgium.*

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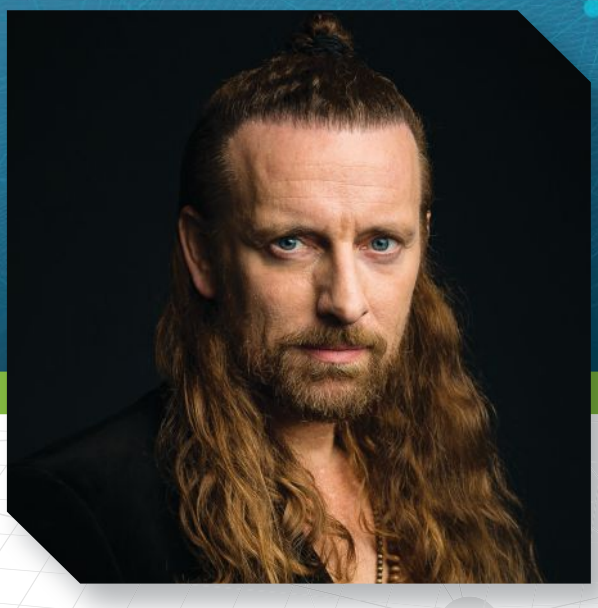

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OPTIMIZING
for low occupancy today and tomorrow

BY ALEXIS HART

FMJ EXTRA
Podcast
How the pandemic affects building expectations

When society responded to the COVID-19 pandemic, offices went from bustling busy hallways to empty dark corridors in a matter of days. Buildings that once catered to guests and workers stand at lower occupancy — or are effectively empty. Unfortunately, because most building owners and developers simply have never encountered a situation like this before, there are still many outstanding questions, even a year after stay-at-home orders were first issued, including:

How to ensure a building is optimized while at low occupancy — and for a longer period of time than originally anticipated?

What are the most important systems and processes to consider when adjusting for extended low occupancy?

When the world makes the transition back to normal, how can facility managers ensure buildings will return properly to normal operations?

What can building owners keep in mind when designing future buildings to better adapt to low-occupancy situations?

LAYING DOWN A FOUNDATION

During times like these, building optimization is crucial, especially when considering cost-savings, reliability and comfort as workers eventually return. When enhancing building operations, FMs must ensure to involve all the necessary stakeholders. This could be anyone ranging from a building management team to a service partner, who should be able to check the boxes for optimization, both remotely and on-site. Furthermore, FMs should carefully document all work throughout the whole process. Doing this will prevent safety or performance issues in the coming months as capacity ramps up, like misaligned HVAC equipment which could end up stalling the return to work for any building. Documentation also creates a precedent for the next time a low-occupancy situation occurs and enables developers to integrate better processes and technologies in newly designed and developed buildings.

MATCHING A BUILDING'S OPERATIONS TO ITS EXTENDED LOW OCCUPANCY

Account for management systems. Consider the HVAC system. Every single component of the system is important as they manage environmental conditions and draw energy. It is also important to determine which assets are connected to the building management system (BMS), and which are standalone. By accounting for management systems, FMs will enable efficiency and effectiveness in making adjustments.

Make the staff currently in the building comfortable. It is important for the climate of the building to be comfortable for those currently on site. Rooms will probably not be at full capacity and gyms and cafeterias will probably be closed, so lighting systems and schedules should also be changed alongside climate control. Depending on local temperatures, FMs can adjust window blinds or coverings to minimize heating or cooling demands to the HVAC system.

Take advantage of fewer temperature demands. While the building is at low occupancy, there is more flexibility in temperature ranges as there are fewer individuals. FMs may want to turn down ventilation and rely on outside air for cooling.

Watch for humidity. While buildings are in low occupancy, moisture and mold may become an issue when not maintained properly, especially if temperature setpoints are going to be changed. The CDC recommends not exceeding 50 percent humidity. Monitoring for this also allows for a quicker and safer return in the future.

Consider future health care procedures of commercial buildings. When workers eventually return, things will not be how they used to be. Occupants will likely continue to wear face coverings, but what else will be required? Will contact tracing be incorporated? How will FMs integrate this into building IoT systems? It is clear there are still some things to figure out.

Take advantage of low occupancy to make upgrades. This may be the perfect time to do that maintenance that has been put off, or finally install that long-awaited upgrade. This way when the building returns to typical operations, it can increase its efficiency and cost-savings moving forward.

INITIATING THE RETURN TO WORK

Now that the building has been optimized for little or no occupancy, it is time to start

thinking about how to handle an eventual return to work. Though it is hard to tell when (or if) a return to full occupancy will occur, FMs will need to plan for four key areas to meet the new demands of the returning workforce.

Safer space management
Enhanced occupant well-being
Improved occupant engagement
Streamlined operational efficiency

1. Space management: Manage proper social distancing across the facility

As people return to office buildings, hotels and restaurants, there will be significant need to monitor and manage social distancing. Fortunately, there are digital tools that help FMs adapt to new regulations, suggested guidelines and company policies.

Proper social distancing: Monitor whether desks and occupants are sufficiently separated via sensors, integrated workplace management software and/or access control systems.

Occupancy monitoring: Set capacity thresholds at the room, floor or building level and receive notifications if occupancy levels risk exceeding limits.

An optimal layout: Analyze how occupants are using spaces to improve floor layout and determine what areas need additional cleaning.

Equipment requirements: Track space usage to determine if there is under-used equipment or space. For under-utilized spaces, FMs can reduce maintenance and HVAC energy use.

2. Occupant well-being: Boost safety and peace of mind

A key element of attracting occupants back to buildings is to increase safety with better air quality, touchless control points and sanitization. New monitoring tools bring intelligence, resiliency and predictive analytics to the table to address this challenge. New considerations for enhancing occupant well-being include:

Air quality monitoring: Monitor and control proper air circulation, per CDC guidelines, across the building to prevent excessive and prolonged air delivery, maintain proper CO_2 levels, and hit comfortable targeted temperature setpoints.

Optimal humidity: Maintain consistent humidity levels that meet the recommended healthy building range prescribed by ASHRAE and the U.S. Environmental Protection Agency.

Volatile organic compound (VoC) control: Improve air quality by tracking and venting VoCs.

Policies and plans: Utilize guidelines developed by Arc Guide to Re-Entry, the Center for Active Design, or the International Well Building Institute for policies around healthy environments and well-being.

3. Occupant engagement: Transparent communications for a better experience

If one side of the equation is being able to make a building safer, the other side is to communicate these safety measures to occupants. New digital tools allow FMs to keep occupants engaged with the latest updates, such as how frequently air filters have been changed and when areas were last cleaned. Approaches to improving occupant engagement include:

Improved communications: Send key updates and share technology improvements to workforce and guests, helping to establish trust and industry leadership.

Manage new complexity: Organize teams rotating between home and office

Share current occupancy levels: Enable occupants to navigate to desired areas with mapping visualizations of open spaces.

4. Operational efficiency: Shrink costs and allocate resources wisely

In the past, building management systems helped the industry improve efficiency. But now, there will be even greater demands put on the building infrastructure. Fortunately, new technologies can help FMs keep occupants comfortable, while simultaneously helping them use energy and resources more wisely. New technologies helping building management teams boost building efficiency include:

Optimized HVAC and energy use: Monitor and manage the HVAC system for enhanced ventilation, temperature and humidity control. Gain visibility and control over energy use across all building systems, so FMs can identify savings opportunities.

Amenity management: Control access, lighting and energy use in areas temporarily left vacant due to lower occupancy, such as gyms and cafeterias.

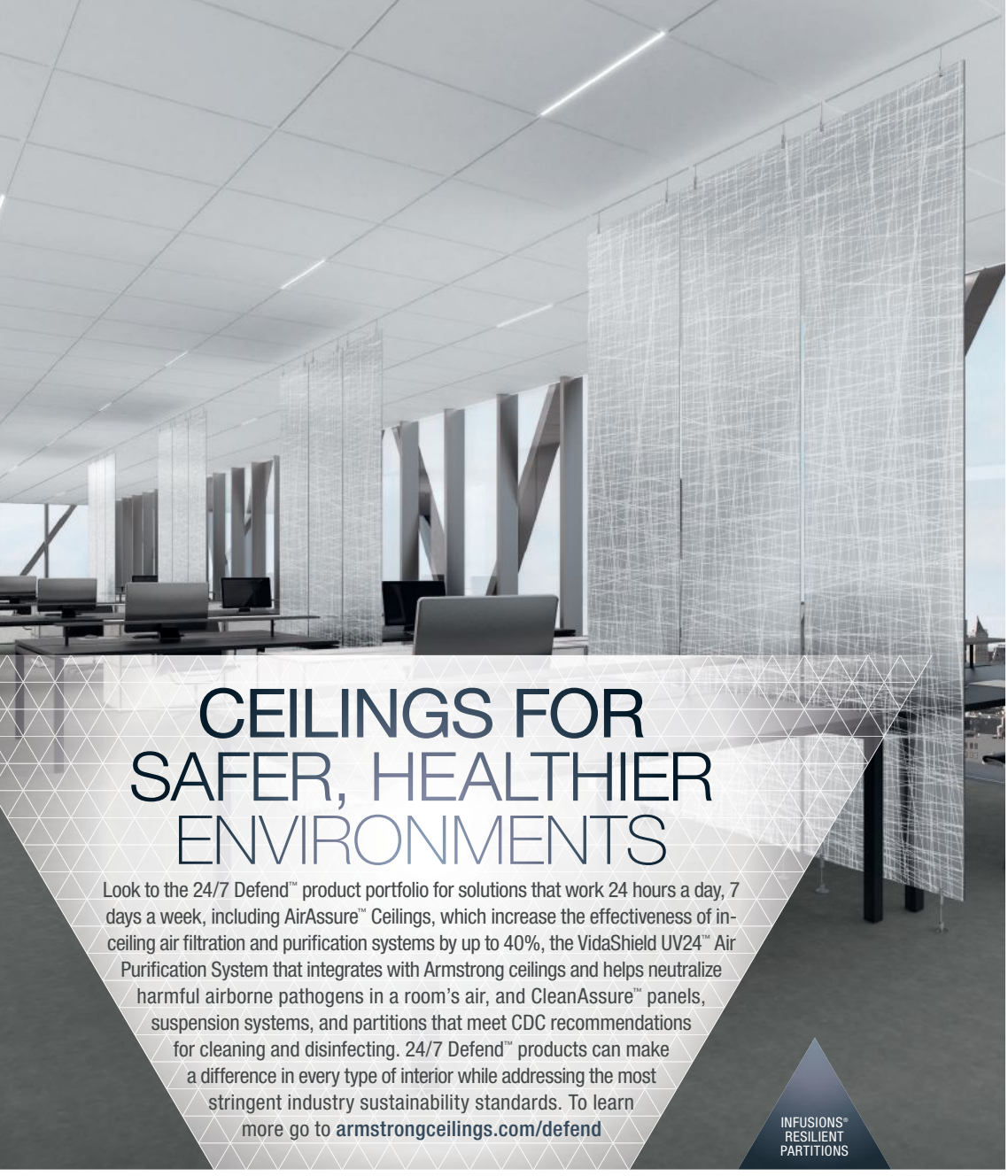
Power management: Monitor and manage electrical infrastructure actively, to ensure power reliability and optimize electrical asset use.

Smart cleaning: Direct janitorial teams where they are needed most, without wasting time on unused areas, via occupancy sensors that alert FMs when areas approach cleaning thresholds.

Asset tracking: Track who uses high-use building equipment such as elevators/lifts, carts, clothing racks and more to determine sanitization schedule and aid contact tracing.

Before people were instructed to stay at home, buildings were one of the biggest consumers of energy worldwide. There is a great need to make sure that FMs and occupants optimize buildings to make them more efficient, both physically and economically — and now, with COVID-19 protocols, to make them safe and healthy for all who pass through them. Not only will optimizing buildings and planning for the return to work help now at low occupancy, but it will help developers and building owners tenfold in the long run. Though all buildings are different and have different needs, optimization is necessary now more than ever. FMJ

Alexis Hart *is vice president of sales within the U.S. Digital Buildings division at Schneider Electric. She began her career in New York City, providing energy management and technology solutions for the city's high-rise buildings.*



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Closet Chaos

Organizational tips for time, labor and cost savings

BY **SUSAN SCAPPARONE**

FMJ EXTRA
Resource
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The COVID-19 pandemic has presented new challenges for today's facilities with safety and cleaning at the forefront of daily business operations. Occupants are paying closer attention to their surroundings as they reenter the workplace, and the way a facility looks on the surface is most often a direct reflection of the behind-the-scenes safety practices. One key area in any building to monitor closer than ever before is the janitorial closet. This small space is the command center of every cleaning crew and it is worth taking a closer look at what is going on behind closed doors.

Creating an efficient and organized janitorial closet is vital to maintaining a clean and hygienic facility, and is necessary for custodial services to perform at peak level. An organized janitorial closet not only sets the tone for how an entire facility should be cleaned, but also translates to the overall professionalism and service level of the facility.

This area is frequently a shared workstation with tight quarters and like many small spaces, is often shortchanged and becomes a pain point for many facilities. Far too often, facility managers waste time and money duplicating cleaning supplies and equipment because they do not know what they have on hand. Fortunately, there are many strategies for maintaining a neat and orderly janitorial closet. Strike a balance between having enough space for inventory and equipment while balancing the need for safety, organization and productivity.

Ten tips for maintaining an organized janitorial closet:

1. TRACK INVENTORY. Stay on top of inventory by keeping a detailed list of equipment and supplies and how often they are used. The janitorial closet should run lean. This allows cleaning staff to know exactly where supplies are available and what needs to be restocked. When organizing, look at each item and determine how often it is used. If it is used on a weekly basis, keep it in the closet. If less frequently, move the bulk boxes and containers somewhere else and only take it out when it is time to use it.

2. CHECK FOR EXPIRED PRODUCTS. Chemical solutions and other supplies should only be kept in a closet in sprayers or secondary containers for up to a week. Get rid of all expired cleaning products. While COVID-19 has not changed how to store products in a closet, the Environmental Protection Agency (EPA) has created "List N," which identifies every disinfectant the agency says kills COVID-19 on surfaces. Regularly check the EPA list at epa.gov as items are frequently updated.

3. USE FUNCTIONAL CUES. Use products, tools and equipment that have clear labels and functional cues to help custodial staff quickly identify what they need to get in and out quickly. Consider using color coding on products as a wayfinding tool to visually communicate product use and coordination with other equipment. This makes it easier for cleaning staff to identify that the "orange" cleaning solution goes with the "orange" mop, trash liner and cleaning supplies for any job.

4. MAXIMIZE WALL SPACE. The U.S. Occupational and Safety Administration (OSHA) has strict guidelines for properly storing materials and equipment to avoid potentially hazardous situations. To adhere to their policies, use the correct shelving. Install racks and wall-mount holders strong enough to support all the weight of the supplies in a closet. Rack-type shelving helps improve air circulation. Organize products by type and usage with the most-used products in easy-to-reach locations. Make sure all paper products are securely placed on shelves above any closed containers filled with chemicals or liquids. Finally, all supplies should be stored at least 18 inches away from sprinklers and smoke detectors.

Having a well-trained custodial staff helps keep a safe and organized environment with less accidents.

5. DON'T FORGET THE FLOORS AND WALLS. Good ergonomics have become an essential part of FM best practices. However, this area of a janitorial closet often gets overlooked. Keeping items on the floor can lead to excessive lifting and more accidents. Remember to refresh the walls and floors with coats of light-color paint to make the closet appear larger and brighter. Painting the floors also has an added benefit of sealing them to avoid dust or mold. Chemicals, powders, rinse water and other items often spill on the closet floor. To prevent these items from being tracked to other areas of the facility, consider installing rubber modular matting systems on the closet floor.

6. ORGANIZE SAFETY DATA SHEETS (SDS). It is not only wise to label everything in the closet, it is the law. These records are crucial items in any janitorial closet. The purpose of SDS is to provide all pertinent information about a given product. For instance, descriptions about proper usage for a chemical, a list of any hazardous materials contained in the chemical solution and a recommendation of personal protective equipment (PPE) to use such as gloves, safety goggles or respirators must be recorded. But equally important is how SDS are organized. A first step is to include a written hazard communication policy. This names the person directly responsible for maintaining SDS records. Second, outline how employees use SDS and what is expected of them to be compliant with OSHA protocols. Third, keep a detailed inventory list or index of all material SDS information in the binder. Always file SDS alphabetically by the chemical product name instead of by operational area or category. This presents less confusion for the cleaning crew staff. Following these steps will provide a clear path to efficiencies.

7. LET THE CLOSET BREATHE PROPERLY. OSHA officials routinely inspect closets for proper ventilation. Double-check that vents are clean and operate correctly. Dust build-up can block heating and air systems from operating properly. If a building is LEED-EB certified (existing buildings), the closets are required to have separate outside exhaust systems with no air recirculation in the closet or closet air mixed with the facility's exhaust system. This will eliminate potentially hazardous or flammable situations.

8. TRAIN STAFF WITH PROPER PROTOCOLS. Having a well-trained custodial staff helps keep a safe and organized environment with fewer accidents. If space is tight, consider organizing cleaning items in a caddy or cart. Require staff members to wipe down their carts with an antibacterial agent or disinfectant at the end of each shift. Make sure they check for a working sink and drain for proper hand washing and water disposal. Also, have a floor drain with an overflow catch pan for easier elimination of waste materials. Lastly, provide wall charts that clearly show the user which product they should use on which surfaces to save time and prevent costly mistakes.

9. SCHEDULE REGULAR INSPECTIONS OF THE CLOSET. Maintenance, cleanliness and upkeep of a janitorial closet should be checked on a regular basis. Creating a checklist for these inspections can help with important communication between supervisors and cleaning crews. Some sample checklist items may include: "Are floors clean, dry and free of clutter?" "Are all lights, switches and outlets working properly?" "Is the first aid kit readily accessible and adequately stocked?" Closets should be inspected at least once a month; and more often, if time permits. During inspections, always remove "unauthorized cleaning materials" such as bleach, ammonia, paint removers or hazardous chemical solutions.

10. CONVENIENCE OF LOCATION. The location of a janitorial closet should not be "out of the way." A conveniently located closet will be used more regularly. A closet located far from the most frequent cleaning areas often requires staff to bring everything they need in one trip, which can result in loss of equipment, accidents and fall hazards for staff and building occupants.

As many FMs prepare for reopening during and following the pandemic, there will be a growing desire to ensure employees and customers a safe and healthy building environment. While challenging, this also creates an opportunity for FMs to move from being a service provider to a strategic change agent for safer work practices. As an industry, one should embrace this opportunity. However, it all starts with an organized janitorial closet. FMJ

Susan Scapparone *is the director of product management for the facilities category at Staples. During her tenure she has been a key contributor in launching the facilities category at Staples with a focus on chemicals and janitorial paper. Scapparone leads a cross-functional team responsible for launching new chemical solutions and cleaning tools.*

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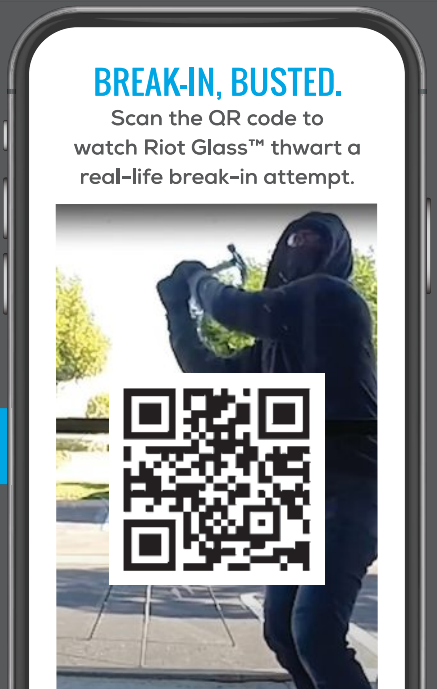

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KEEPING PACE

Scanning to BIM for QA in High-purity Environments

BY KEN SMERZ

Certain built environments, such as semiconductor and biopharma plants, are in constant flux to keep pace with innovation. These facilities are in a continuous state of renovation and evolution to accommodate new tools, processes and teams, and they rely on digital models to re-engineer and manage these spaces to avoid costly downtime and maximize production.

While downtime takes its toll on any business, it is particularly so in high-stakes environments like semiconductor and biopharma, where even a one-second lull in production can cost millions. As important as facility reconstruction is for these types of industries, it is even more mission critical that the construction does not disrupt operations.

Adding to the complexity, these types of high-purity environments typically comprise an intricate and complicated web of pipes carrying chemicals and compounds that must be delicately maneuvered around the facility. To meet these unique needs, many organizations deploy building information modeling (BIM) processes to gain a highly accurate understanding of the existing physical space prior to undergoing construction.

But achieving this level of insight relies on accurate, precise data and not all methods for collecting and applying that data — known as the scan-to-BIM process — are created equal.

BIM in high-purity environments

BIM refers to a highly accurate, 3D digital model of the physical characteristics of a building or structure. It is increasingly being used in high-purity environments — namely semiconductor, biopharma and other manufacturing facilities — to understand the dimensions of an existing structure, keep updated records of the facility, detect possible construction errors, evaluate changes over time and examine the design intent on something that has yet to be built.

When executed properly, BIM processes can lead to greater construction efficiencies including reduced rework, lower materials and labor costs, advanced clash detection and off-site prefabrication. Additionally, it also supports highly accurate 3D models that allow these facilities to be designed in a virtual world first to better understand relationships between spaces, materials and various systems within a physical structure, and how real-life elements will impact it.

It might go without saying that BIM relies on quality data. If that is compromised, it can have a significant negative impact on the outcome. This is where a highly accurate scan-to-BIM process comes into play.

Scan-to-BIM unpacked

Scan-to-BIM is the process of using a laser scanner to capture a 3D scan of an existing structure. This scan data is then imported into a 3D modeling program to create an accurate digital, as-built representation of the space or site. This model is then used to inform design, evaluate progress and determine options.

The scan-to-BIM process can further be broken down into four general stages that make up the workflow. Unfortunately, there are no industry-wide standards or templates to follow — and there is not yet a tool that can automate the workflow. But there are best practices that can be implemented prior to each phase to control quality and accuracy.

The general phases of a scan-to-BIM workflow, include:

» **CAPTURE. The gathering of information from a site or space using a variety of tools and devices. This might include 3D laser scanners, cameras, gauges, measurement tools and recording devices. These devices capture the raw information that will provide the basis or foundation of the digital as-built.**

» **PROCESSING. The conversion of the raw data collected from the capture devices into consumable elements that the modeling software can assimilate.**

» **MODELING. The creation of a 3D virtual representation of elements based on the registered data. It can represent selected elements of the structure or the entire environment.**

» **QUALITY CHECK. The detection, correction and validation of the project information to guarantee model accuracy.**

Prior to each of these phases, however, there are quality assurance (QA) opportunities to prevent downstream mistakes or defects. QA measures implemented throughout the scan-to-BIM workflow will have a direct effect on the time investment needed during the quality-check phase.

Scan-to-BIM best practices and common mistakes

Time spent on QA will be time well spent, especially in highly technical, fast-paced, high-purity environments. The slightest mistakes made in environments that rely on agility and speed to innovate can create extraordinary costs later.

QA practices can, and should, be deployed throughout each of the four scan-to-BIM phases. For instance, in the data-capture phase, there are pre- and post-mobilization factors to consider. To start, a scope of work should be well defined and include the timeline for milestones and deadlines, as well as what the expectations are regarding the final deliverable. Particularly in environments like semiconductor and biopharma that require a high degree of specificity, defining the desired level of detail (LOD) is imperative to success. Other areas to evaluate:

- **Equipment selection** — laser scanners each have specific strengths and limitations, and there will not be one that fits all needs. Device selection should be determined based on the needs of the job and which is best equipped to align to those needs.
- **Equipment security** — this is often overlooked, but the slightest bump during the transport of the equipment can throw off the calibration. Conducting a pre-scan to test the calibration against later can save hours of potential rework.
- **Preplan data-collection methodology** — evaluating and planning the methodology for data capture prior to arriving on site helps prevent key information from being overlooked. The environment will ultimately dictate what methodology — whether cloud-to-cloud, traverse, survey control, etc. — is the best process. Once chosen, teams must discuss this with everyone on the crew before the project so there is alignment.
- **Level of accuracy (LOA) and LOD** — these are not the same thing and must be clearly defined in advance of project kick off. LOA refers to how accurate the data collection needs to be dimensionally, where LOD refers to the details/items that need to be modeled from the raw data.
- **Confirm site conditions** — preplanned methodologies were assumptions up to this point. Validating the methodology once on site —based on the current conditions — is critical prior to starting.
- **Closed loops and maintain direction** — working with laser scanners, and particularly when using the traverse methodology, the opportunity for error starts to accumulate with more scans. Closing the loop essentially creates small circles of overlap that will detect commonalities and balance errors, reducing the impact of accumulation. Additionally, simply by maintaining direction with each scan (facing north, as an example), will help reduce deviation.

Similarly, the processing phase can be distilled to two stages: pre- and post-registration (also known as point cloud registration or scan matching). During this phase, the point cloud data collected from multiple data sets are aligned to produce a globally consistent model. The margin for error here can be significant, making it imperative to implement QA measures in the pre- and post-registration. Best practices in both stages include:

- **Validating survey data** — relying on the registration program to validate the accuracy can lead to errors, as most programs hold survey data as an absolute. Instead, a series of checks should be placed throughout to identify survey errors before committing to the registration process.
- **Setting alignments** — teams should understand why and how data will be aligned.
- **Inspecting scans manually** — leaving this to the software to inspect can also lead to errors, as data tends to overlap. Each scan should be manually inspected for interruptions in data fluidity, which can be caused by environmental vibrations.
- **Transferring data** — how data will be sent and shared must be considered, especially when working with dispersed teams. This can create significant delays as these data files are generally extremely large. Prior to this phase in the workflow, teams should determine how data will be uploaded and shared, what tools will be used to facilitate this, who is in charge of processing the raw data, etc.

In the modeling phase, communication between all stakeholders is key — and it is one of the most effective ways to reduce error. The modeler should also have prior experience in modeling and know what to look for in terms of errors. Creating a test sample of the model to verify all stakeholders are on the same page is also a good idea before getting too far into the project.

Additionally, there are a number of conversion tools available, and similar to the scanning equipment, each has its strengths and weaknesses. Compatibility with the modeling software being used and the primary use for the model should be a consideration. Finally, in almost all cases, as-is models are being created. Teams will want to be careful to model on the existing phase versus the new construction model at all times.

The final phase of the scan-to-BIM workflow is the quality check. This will require going back to cross-check the scope of work — from the expectations to the milestones to the LOD and LOA. Establishing a set of internal checklists and templates is helpful at this stage to create a consistent process that can be replicated each time.

With scan-to-BIM projects, there will be a massive amount of raw data. This should be filtered based on the actual needs of the project, and aligned to expectations and project goals for all shareholders. This can be achieved by verifying the model using three views, such as in a plan, section and 3D section box. Virtual walkthroughs using software can also help detect any errors or overlooked items.

Advancing construction in high-stakes environments

BIM is enabling those in manufacturing, particularly in high-stakes sectors like semiconductor and biopharma, to not only better understand their physical environment, it is also proving a powerful tool in mitigating downtime and rework, and offsetting the shortage of trade labor by way of off-site prefabrication.

In any scenario in which manufacturing cannot be halted or reduced, BIM is a tremendous added value, but it will only be as valuable as the data used to inform it. When executed with the right QA/QC methodologies, BIM will enable those in industries like semiconductor and biopharma to retool their facilities faster and bring new products and innovations to market sooner. FMJ

Ken Smerz *is the CEO of ZELUS. As CEO, he leads the company's strategic growth and partnerships, oversees team culture and talent acquisition, and guides national expansion efforts.*

Responsible Reentry

HEALTH AND SAFETY MEASURES FOR FACILITIES IN THE COVID AGE

BY JUDSON KLEINMAN

Facility managers are dealing with myriad responsibilities, ensuring everything to do with the physical space of the business is running safely and efficiently. With COVID-19 bringing new health and safety standards to bear, FMs are also on the front lines of ensuring the property is a healthy environment. For example:

- As offices continue reopening and workers return to the workplace, break rooms and common areas must be reimagined to ensure safety, with touchless technology devices that can be deployed in any building.
- College campuses can become petri dishes for the spread of coronavirus. Although it is difficult to enforce handwashing, mask-wearing and no partying in large groups, equipment can be installed to reduce the risk of virus transmission.
- Nursing homes and other senior living facililties are under scrutiny for some of the highest disease incidence and death rates. Beyond adequate inventory of personal protective equipment, what else could have been used to help curb risk?

Given the new era, there are several key measures and devices FMs should be aware of and can easily implement at their locations, from office buildings to health care facilities to congregate housing residences.

A year into the COVID times, more is known about the virus and how it is spread and there are technologies readily available to help create safer, healthier facilities.

NANOTECHNOLOGY SOLUTIONS

There is no question that the awareness of cleaning has been amplified in the COVID-19 era; cleaning and disinfecting protocols have been pushed to the forefront and the public is more aware of touching surfaces that may be a contamination point for dangerous viruses and bacteria. However, beyond cleaning those surfaces is actual disinfecting, which traditionally takes time, manpower and supplies.

FMs have an easily applied solution to reducing contaminant transmission on high-touch surfaces with nanoseptic technology.

Nanoseptic film — available in various sizes and can be cut to size — is a self-cleaning product powered by light that continuously oxidizes organic contaminants such as bacteria, viruses and fungi on a microscopic level, on high-touch surfaces. Nanoseptic technology continuously works on public touchpoints, without harmful chemicals or heavy metals, using mineral nanocrystals (embedded titanium oxide nanoparticles) that are bonded to the material. There is nothing released into the air and the film inactivates pathogens for up to 90 days (depending on traffic).

While most facilities have installed hand sanitizer stations at building entrances and elevator banks, nanoseptic film can be applied to elevator buttons, door handles, railings, light switch covers and touchscreen surfaces as a supplemental sanitization measure that also puts visitors at ease. The products are clearly labeled to show occupants that the technology is at work; the visible presence of nanoseptic film and mats (designed for counters, reception desks, trays and tabletops) creates trust and confidence among staff, residents, tenants and visitors that the surfaces are contaminant free. This may also reduce the use (and expense) of paper towels and tissues that many people reach for to protect their hands from directly touching the surface.

Cleaning teams have only to wipe the surface with a microfiber cloth and warm water to remove dirt; no other maintenance is required to enable the oxidation process to do its job. Time spent sanitizing surfaces is reduced and there are no special (or harsh) cleaning supplies needed. Because there are no toxins or chemicals involved, nanoseptic film also satisfies mandates for green alternatives to traditional disinfectant products.

AIR PURIFICATION WITH SURFACE SANITIZATION TECHNOLOGY

The increased energy-efficient construction of buildings is creating a pollutant trap when sufficient mechanical ventilation for adequate air exchange is not present. The U.S. Environmental Protection Agency estimates that indoor concentrations of some pollutants are two to five times higher than outdoor levels. This is exacerbated by the increased use of synthetic building materials as well as certain cleaning products.

Add concerns over viruses such as influenza, MSRA and SARS-CoV-2, and it is clear that air purification is needed in many environments to reduce transmission of harmful pathogens and allergens such as viruses, bacteria, dust, mold and fungi.

There are several effective products available to purify indoor air, such as HVAC in-duct air purifiers that work on

ionization or UV light technology. For FMs seeking a simpler, highly effective solution there are portable plug-in devices that require no installation, with some able to deliver medical-grade air purification down to .1 micron. The equipment is an important element in a facility's sanitation plan as a supplement to increased HVAC system ventilation, especially in the COVID-19 era; it also supports best practices outlined by the CDC and other entities by boosting filtration and reducing the spread of infectious droplets.

Look for units that report particle removal capability by efficiency (such as "removes 99.99 percent of particles down to X microns"), which is the Clean Air Delivery Rate (CADR) rating system for performance, or units that use high-efficiency particulate air (HEPA) filters — alone or in conjunction with other technologies such as ionization, light waves, carbon filters and catalytic processes. Depending on manufacturer and model, portable air purification units can handle a wide range of indoor spaces from 2,000 to 20,000 square feet, with variable rates of air changes per hour (ACH).

TOUCHLESS TECHNOLOGIES

Beyond the larger-scale domain of touchless/smart lighting, HVAC controls and other building automation, FMs can bring touchless technology to spaces and people with:

Temperature scans The public has grown accustomed to having temperatures taken at doctor's offices, hospitals, even restaurants and salons. Contactless temperature scanning with handheld thermometers may not provide enough physical distance and require another person to use it.

However, for FMs who manage buildings with heavy foot traffic, cost-effective, touchless temperature scanners can be installed on walls at entry points; visitors simply place a hand beneath the scanner for an instant readout via thermography. This enables a facility to vet many people quickly.

There are also automated, hands-free temperature scanning kiosks that deliver real-time infrared thermal imaging and scan for elevated temperatures, all at a social distance from personnel. They detect accurate body temperature in seconds and provide instant notifications if a high temperature is assessed, making them well suited for schools, congregate housing and senior communities, hospitals, retailers and other businesses. Some are also equipped with optional facial recognition features and fully integrated security solutions.

Break room and cafeteria upgrades — contactless beverage dispensing The new company break room or common area can be made safer and reduce surface contamination with touchless technology; in these spaces, it is showing up in a few ways, such as app-driven contactless coffee brewers and beverage dispensers. There are systems available that produce a variety of coffee drinks (including espresso favorites), and others for chilled fresh juice and water, that sit beneath a counter, with only the dispensing faucet visible. These low-profile units are controlled by a mobile app. Users can select and customize a coffee drink or request juice or water (including sparkling options) and send the order to the unit, using the system's touchscreen or with their own mobile device.

Installing the coffee, juice and water systems provides a suite of touchless solutions that are ideal for hotel breakfast service, conference center break areas, airport clubs, hospital cafeterias, waiting rooms, lobbies and office building cafes. The touchless water dispenser also enhances environmental conservation by reducing the need for bottled water and reducing recycling costs of plastic bottles.

For operators who keep office water coolers in place, foot pedals can be installed for hands-free dispensing. As an extra layer of protection, installing point-of-use water coolers with built-in, high-quality filtration may alleviate users' concerns about transmission of pathogens through the water supply; side benefits of these units are, like the touchless solution noted above, that they reduce cost and waste associated with bottled water and meet an organization's focus on sustainability.

In many buildings, water fountains have been turned off to avoid manual usage and the spread of COVID-19. Sensor-operated water fountains mitigate risk by circumventing the need for touch.

If the FM budget allows for a more extensive upgrade, expand the idea of no-touch faucets beyond restrooms to enhance hygiene anywhere multiple people use sinks, such as office building cafes, commercial kitchens, medical exam rooms or research labs. The same goes for touchless paper towel and soap dispensing and trash receptacles. Installing them in the breakroom or other areas will cut down on that surface contamination and in the case of paper towels, reduce waste.

Vending Touchless, cashless vending machines put safety and hygiene in any space. Some machines are operated through an app, with consumers selecting and paying automatically on their mobile devices; others use the phone's camera to direct users to a website where they make selections, view product details and check out.

A REMINDER ABOUT THE BASICS: PPE

The term unknown to the public a year ago is now common vocabulary. While there may not be enough in the budget to implement some of the technologies related to disinfecting, having adequate supplies of masks on hand for maintenance crews, security guards and other building personnel is key; depending on the environment, gloves and shields may also be part of the FM team's standing PPE inventory.

Technology is becoming a great problem solver for FMs, who are tasked with implementing additional layers of security in their buildings — including those who protect occupants against invisible, infectious intruders. Knowing about easy-to-implement solutions that do not require undertaking disruptive renovations will help FMs create a healthier indoor environment, often with budget-friendly products. FMJ

Judson Kleinman *is the president and CEO of Corporate Essentials, a leader in office coffee service, break room design, office catering, air and water filtration, and employee engagement solutions. He is also president of Shoffee, an online retailer of coffee and breakroom snacks and supplies, and CEO of TopBrewer NYC, an industry pioneer in touchless coffee beverage dispensing for commercial environments. In 2019 he was also a finalist in the EY Entrepreneur of the Year in New Jersey.*

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THINKING AHEAD

BY BILL CONLEY

Using BCPs to stay afloat

Of the many lessons learned from the COVID-19 pandemic, the way facility management views business operations is one of the most significant. One lesson in particular is the realization of the need for a more extensive business continuity plan (BCP) that broadens and deepens the scope of disasters that could minimize business production. Even if a BCP exists in the facility, it might be a good time to revisit or revamp it.

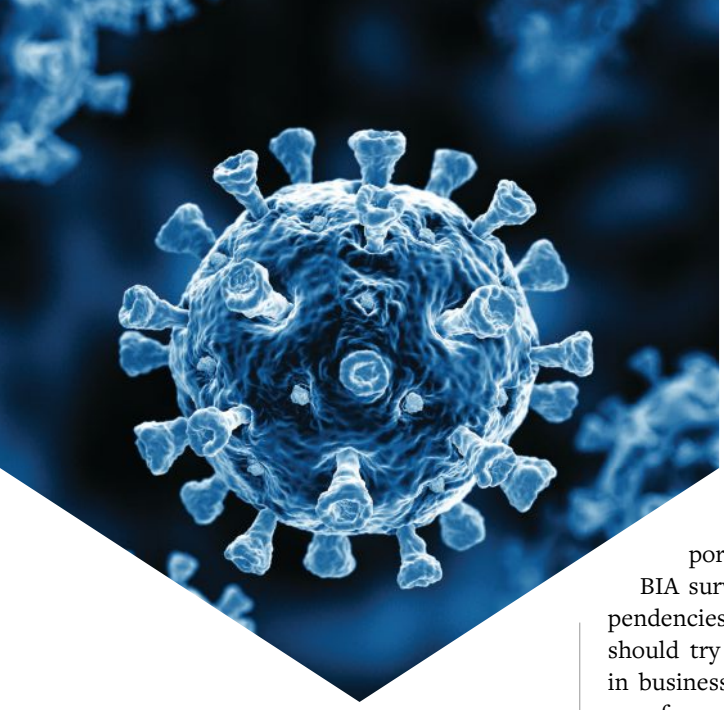
Business Continuity Plans identify methods a company will use to continue operations after being affected by a major event. Such events can include a pandemic, natural disaster, theft of private business information or an accidental catastrophe. Specifically, the plan details what the company will do to remain in operation after the disaster until normal business operations can resume. When confronted with unexpected disruptions, organizations must react swiftly, methodically and successfully or risk significant financial loss. This level of response requires extensive continuity planning to ensure all aspects of the organization are evaluated and protected. FMs are responsible for the health and safety of employees so that they can effectively continue production, resulting in a different focus that other business units may have. Using the rationale that FM and human resources are more concerned with the employees of the company and not necessarily the business, the company may create a separate BCP devoted to those two departments.

FM business continuity consists of planning, preparatory and related activities to ensure that an organization's critical employees can continue to operate despite serious incidents or disasters. BCP goals also should include resolutions that will enable the company to recover to an operational state within a reasonably short period.

BCPs should be built with resiliency in mind. Critical business functions and the supporting infrastructure must be designed and engineered so they are materially unaffected by most disruptions, such as using redundancy and alternate work sites. Arrangements should be made to recover or restore critical and less critical business functions that fail for some reason. The FM organization must establish the capability and readiness to effectively cope with whatever major incidents and disasters occur.

Initial Concepts

FM must ensure employees' safety and protect property and assets. The department must help restore essential functions so the company can return to business as usual. BCPs provide guidance for ensuring that personnel can respond, resume and recover to a predetermined level of operation following a disruption.



An effective BCP is the cornerstone of effective resilience planning efforts and will frame an FM's ability to assist the resumption of HR and facilities' essential functions. Efforts to maintain continuous business operations bring value to all employees by providing the ability to continue with their jobs and keep the company afloat. Naturally, this would tie into the corporate plan, but with a diverse focus that would still resonate throughout the organization.

FMs are trained to prepare for recovery from disruptions. FM plays a vital role in response and recovery activities, working with the recognition that these activities are part of their existing job duties.

One integral step is assessing the company's risks and exposures. Risk assessment entails a comprehensive evaluation of threats and their potential disruptive impact on the business. Working with the IT department to understand telecommunication recovery options is critical. A subsequent ranking of findings will assist in the development of a roadmap.

Business Impact Analysis

The key to a successful BCP is understanding the impact a disaster situation could have on a business and creating policies to respond. A business impact analysis (BIA) can identify the effect of an incident/disaster on the FM team's operations. A BIA builds on the BCP's foundation and identifies the essential functions, resources, personnel and suppliers of the facility to determine the minimum level of operation needed for business to continue during and after an emergency.

Many FM teams are often not included in the corporate planning process, because BIA surveys normally focus on IT dependencies and financial impacts. FMs should try to maintain a significant role in business continuity – the people they care for represent the second largest and most important business assets on which day-to-day business operations rely. A sound, FM-focused BIA enables the department to determine their most critical business processes.

During this phase, information is collected on recovery assumptions, including recovery point objectives (RPO) and recovery time objectives (RTO). Critical business processes and workflows should be documented, as well as personnel roles and backups, their skill sets, and primary and secondary contacts. This process also requires validation that the recovery times stated in the plan are obtainable and meet the objectives. These should be accessible and available to staff, so they will be ready should a disaster occur.

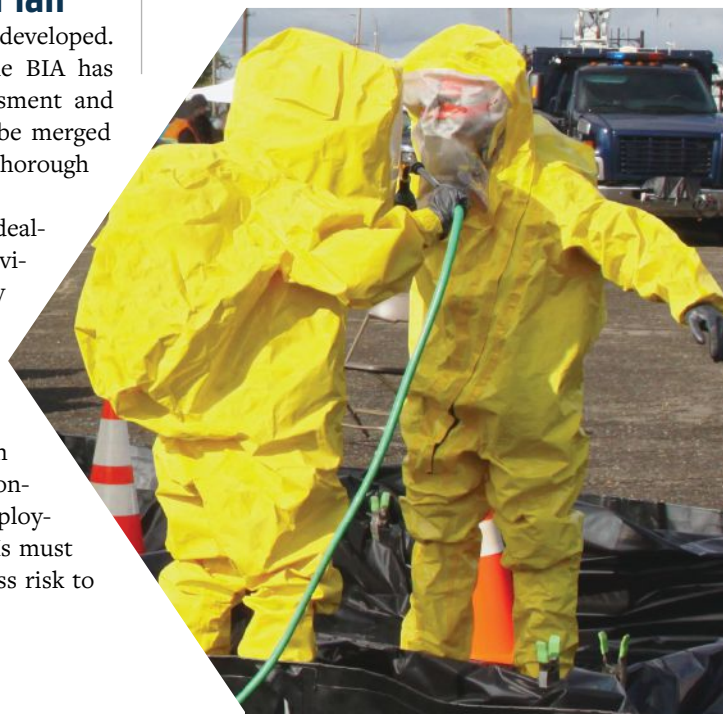
Business Continuity Plan

Using the BIAs, a BCP can be developed. Once executive sign-off of the BIA has been obtained, the risk assessment and BIA prioritization results can be merged to create an actionable and thorough plan.

FMs should have plans dealing with all departments, divisions and the overall site. They should review the plan with key stakeholders to ensure every aspect of the company has been addressed. They must leave no business function out of the plan, as FM is responsible for accommodating all employees' needs. In that respect, FMs must understand the level of business risk to each department and how to keep them optimally operating. The BCP will reveal a disaster's potential effect on employees and customers, and how to keep them content. It is important to incorporate many perspectives from various staff and all departments to map the organizational focus.

If an incident impacts the facilities, the recovery strategies should have been identified by the BIA and include continuing essential business activities. When the primary facility is not accessible, it will be necessary to relocate personnel to an alternate site, which is identified in the BCP. These alternatives are intended to be short-term relocations to continue essential functions only and are not meant for all department employees. In case of a long-term disruption, the company may pursue strategies that include the relocation of personnel and continuation of essential business activities of facilities in other locations.

The final critical BCP element is ensuring that it is tested and maintained on a regular basis. This includes conducting periodic table-top and simulation exercises to ensure key stakeholders are comfortable with the plan. Ideally, biannual plan reviews are executed, and BIAs are revisited annually.



Emergency Response Structure

Every organization needs a governance hierarchy that will be reflected in the BCP. This is where a BCP developed for the FM team strongly coincides with a corporate BCP. There are three major groups that should be created and informed of their roles.

ERT (emergency response team)

In times of emergency defined as Level 3, the most serious of incidents, the ERT will be comprised of the senior executive committee (SEC) and representation from key business groups. The ERT will direct, support and monitor the initial response in the case of an event and dictate actions and the implementation of the BCP. The FM should assume the role of facilities business continuity lead, which has the responsibility of ensuring that the workplace is safe for employees and provide the ability to continue working on company business.

CERC (corporate executive response committee)

The CERC should include corporate executives who will direct, support and monitor the initial response in times of an emergency defined as a Level 2 event.

CCC (crisis communication committee)

A communications plan should be put in place to alert all appropriate stakeholders of an incident (text, email, phone calls or whatever is available to broadcast a message). Incidents can include those that are affecting an entire organization or specific divisions.

A spokesperson must be identified as the one and only dispenser of information. This executive will be responsible for the communication of accurate, effective and timely messages based on CCC input using the appropriate mass communication tool.

The primary function of the CCC is to ensure that messages truly represent the company through communications to stakeholders and to edit and distribute communication as required.

The CCC provides the lead communicator with available information and counsel pertaining to the incident to ensure communication is accurate and effective. Subject matter experts (SMEs) may be added per relevant incident. Any business unit or corporate division wanting to send out a communication to a group of employees, vendors or customers resulting from or pertaining to one of the disruptive incidents must send their draft materials to the committee for review prior to distribution.

All communication is developed by the CCC for both emergencies and non-emergencies. For all non-

It would be a disaster to ignore the assistance FM can provide.

emergencies, the CCC will receive guidance from the CERC or ERT and develop the initial communications. The CERC or ERT would have the final approval before the communication is sent out to the appropriate stakeholders.

The Role of FM

FMs are often overlooked as they are so ubiquitous as to almost be invisible. Senior management may not appreciate all that FM teams are doing until it is not getting done. The same could apply to business continuity. FMs have access to knowledge that others do not. They have established contacts with suppliers, vendors and trades that may be required following a disruption. They are responsible for critical support functions such as physical security, building integrity and familiarity with local emergency services. They also understand priorities for long- and short-term recovery strategies.

FMs must place themselves in the conversation. Having their own BCP to take care of operations is a strong discussion point. FM is an invaluable and indispensable resource in business continuity and incident management. Thus, it is incumbent upon FMs to develop a plan that augments the overall corporate plan but is specific to what the facilities department needs to do in case of a business disruption.

Planning for a business disruption is an essential part of FM's mission to protect employees and company assets. FM's value extends beyond reacting to situations; they have a holistic view of their company, so they can plan to support all departments through any event.

FMs are agile, resilient and adept at responding to challenges on a daily basis. Every business continuity management program should include an FMBCP. The FM team can help construct a high-level strategy with incident management plans. Much as the technical support provided by IT, FM staff possess skills and knowledge that can be of benefit before, during and after a disruption. It would be a disaster to ignore the assistance FM can provide. FMJ

Bill Conley, *CFM, SFP, FMP, LEED AP, IFMA Fellow, is a facility manager at Yamaha Motor Corp. in Cypress, California, USA. Prior to that, he served as owner and chief sustainability officer of CFM2, a facility management company. Conley has more than 40 years of experience in the facility management profession and has been a proponent of sustainable operations for more than 20 years. Conely has served on the IFMA board of directors, is a recipient of IFMA's distinguished member of the year award and has received the association's distinguished author award three times. He has been a regular contributor to FMJ for more than 20 years and has authored more than 70 FMJ articles.*

Synthesizing ideas and industries for a new world of work

The workplace is changing dramatically. In the future-of-facilities conversation, FM is the central character; but in a post-COVID world, every built environment industry has a part to play. Let's talk about each performer's role and how FM can lead this important cast in reimagining work and the workplace.

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NOW IS THE TIME

Why FMs should implement security assessments

BY JONATHAN TAL

For facility managers, there is light at the end of the pandemic tunnel.

In a recent virtual town hall meeting, American businessman and billionaire Mike Bloomberg said offices are not going away after the pandemic passes. He indicated that companies will still need central locations for staffers to gather and collaborate.

He also added that business owners who initially thought they could allow their staffers to work remotely on a permanent basis are now reconsidering their positions. "Everyone, including the employees, is now realizing they are losing touch with each other and the company. Remote, permanent remote working simply will not work."

Recent studies support his conclusion, such as one recently published by Cushman & Wakefield, the world's largest property management company. They conclude that offices serve "a vital purpose as an inspiring destination that strengthens cultural connections, learning and bonding with customers as well as colleagues."

However, this upbeat look into the future does not suggest a change is right around the corner. It may be months, possibly a year or more, before the pandemic lifts and staffers can return to the workplace. Additionally, both Bloomberg and Cushman & Wakefield suggest that the number of staffers returning to the workspace may never be the same. Some staffers may continue to work remotely, part-time or full time. Ultimately the number doing so will likely dwindle.

This means there could be partially, if not totally, empty office buildings for months to come, which provides FMs a unique opportunity to assess their current building security and ensure their property is safe while it is unoccupied.

This is also an opportunity to verify that measures are in place to help safeguard buildings and the people that use them once the facility is reoccupied.

Typically, this involves conducting a security assessment. While in-house security personnel working for an organization or a management company can conduct such an assessment, it can be wise to have a new set of eyes brought in to review the facility's security situation. All too often, security breaches are quickly noticed by outside security consultants that are ignored or simply not seen by those working in or using a property regularly.

CONDUCTING A SECURITY ASSESSMENT

Facilities face endless security risks that threaten people and property. These risks can vary considerably, and some are unique to different types of facilities.

For instance, hospitals have many specific security concerns that would not be shared with, for example, a commercial office building. While most medical facilities are trying to remain open to visitors and family members as much as possible during the COVID-19 pandemic, many regulate the number of visitors to the hospital or ban them entirely; not only because hospitals are crowded with COVID-19 patients, but to also keep vulnerable patients and staff safe from unnecessary stress, tension or harm.

This situation is being repeated in all types of facilities. To evaluate the level of protection of both people and property, a security assessment investigates several aspects in and around the facility.

Site information. A facility located in a heavy crime area, for instance, may be more of a target for break-ins, burglaries, vandalism, street unrest and other unsavory activity. But site information review would also reveal such things as emergency response issues. How quickly can emergency personnel arrive at a property should there be a threat? Consider the facility's distance from major roadways, typical traffic patterns and clearly visible signage.

Site appearance. Facilities that are not well-maintained often attract more crime. This is one reason many police departments recommend that FMs remove graffiti as soon as it is discovered. Graffiti on a property tends to attract more graffiti. If the property appears to be neglected, it could also become a target for vandalism and problematic activity.

Management policies. Does the organization have steps in place to deal with a security breach? This would include not only violations such as break-ins or robberies, but also shootings or terrorism. Anything

WHAT'S A LOCKDOWN?

THE NAME SAYS IT ALL. A LOCKDOWN IS WHEN EVERY DOOR, WINDOW AND OTHER ACCESS POINT IN OR OUT OF A FACILITY IS LOCKED. THIS COULD ALSO INCLUDE TURNING OFF ELEVATORS, ESCALATORS, BUILDING MECHANICALS, ETC. WHILE LOCKDOWNS CAN OCCUR DUE TO STORMS AND OTHER ACTS OF NATURE, THEY MOST COMMONLY OCCUR WHEN THERE IS A PROFOUNDLY SERIOUS CRIME HAPPENING, SUCH AS A SHOOTING OR THE POSSIBILITY OF A SHOOTING. THE GOAL IS TO MAKE SURE EVERYONE IN THE FACILITY STAYS PUT UNTIL EMERGENCY PERSONNEL ARRIVE AND PROVIDE DIRECTION.

that happens globally can happen locally. Because of this, FMs must have a plan in place.

Emergency preparedness. Practices and plans must be in place not only to handle crime situations or the threat of crime, but to handle weather emergencies like tornadoes, earthquakes, power failures and lockdown conditions. Are drills established and practiced for such situations? Are evacuation plans posted? Do people understand what is expected should there be a lockdown?

Physical security. Physical security typically starts at the front door, and often before anyone even reaches the front door of a property. Is the property gated? Gated properties tend to be safer than those that are not. Must building users and visitors check in with security personnel when entering the property? Do building users have identification badges with them or go through metal detectors when entering the property? With COVID-19, are technologies in place to monitor the temperatures of large numbers of people entering the facility?

Outdoor security. Are there hidden areas around the facility that might invite crime? Is the property adequately lit? Are high-definition smart cameras installed as well as zero-light camera systems? Smart cameras are triggered by movement. Zero-light cameras can take crystal-clear images day or night.

Access control. How easy is it for staffers and vendors to enter the building, day or night? What protective measures are in place and how often are these measures updated? Larger commercial facilities in major cities often have several access control measures in place. However, facilities in less populated suburban areas may have very few.

Cyber security. The migration to remote work was born of necessity. But it happened so quickly that many IT professionals did not have time to implement data security programs that would allow staffers and their employers to work together safely and securely from home. Cyber security is always an issue. Steps must be taken to ensure remote workers can interface freely and securely with corporate databases and information sources.

Crisis communications. Managers need to know who they must call and what steps they must take in case of an emergency. Failing to act promptly and properly in a crisis can put people and property assets at greater risk. Lack of a communication strategy often increases the likelihood of lawsuits, job loss, profit loss, fractured employee morale and loss of trust in an organization and a facility.

FUTURE SECURITY

Most of the items discussed here can be implemented while the property is not in use or used marginally. However, once it is in operation, these and many other measures should be in place, most of which relate to what the security assessment has uncovered.

Security assessments are not one-time projects. They must be revised and updated as situations change and response practices evolve. This is especially true when it comes to cyber security issues.

Finally, one big shift that should take place once a security assessment has been completed is for FMs to move from a reactive stance toward security to a proactive stance. Times have changed. Years ago, building security meant little more than having a guard stationed at the front door. That will not suffice in today's world, making the need for a security assessment all the more necessary. FMJ

Johnathan Tal *is CEO of TAL Global. His career started as a military field intelligence officer for the Israeli Armed Forces where he supervised and initiated behind-enemy lines intelligence gathering during the 1973 Yom Kippur war. Based in the U.K. in the late 1970s, he served as an anti-terrorism security specialist for the Israeli government. This job was to determine if a terrorist attack was imminent and, the most crucial step, prevent it.*

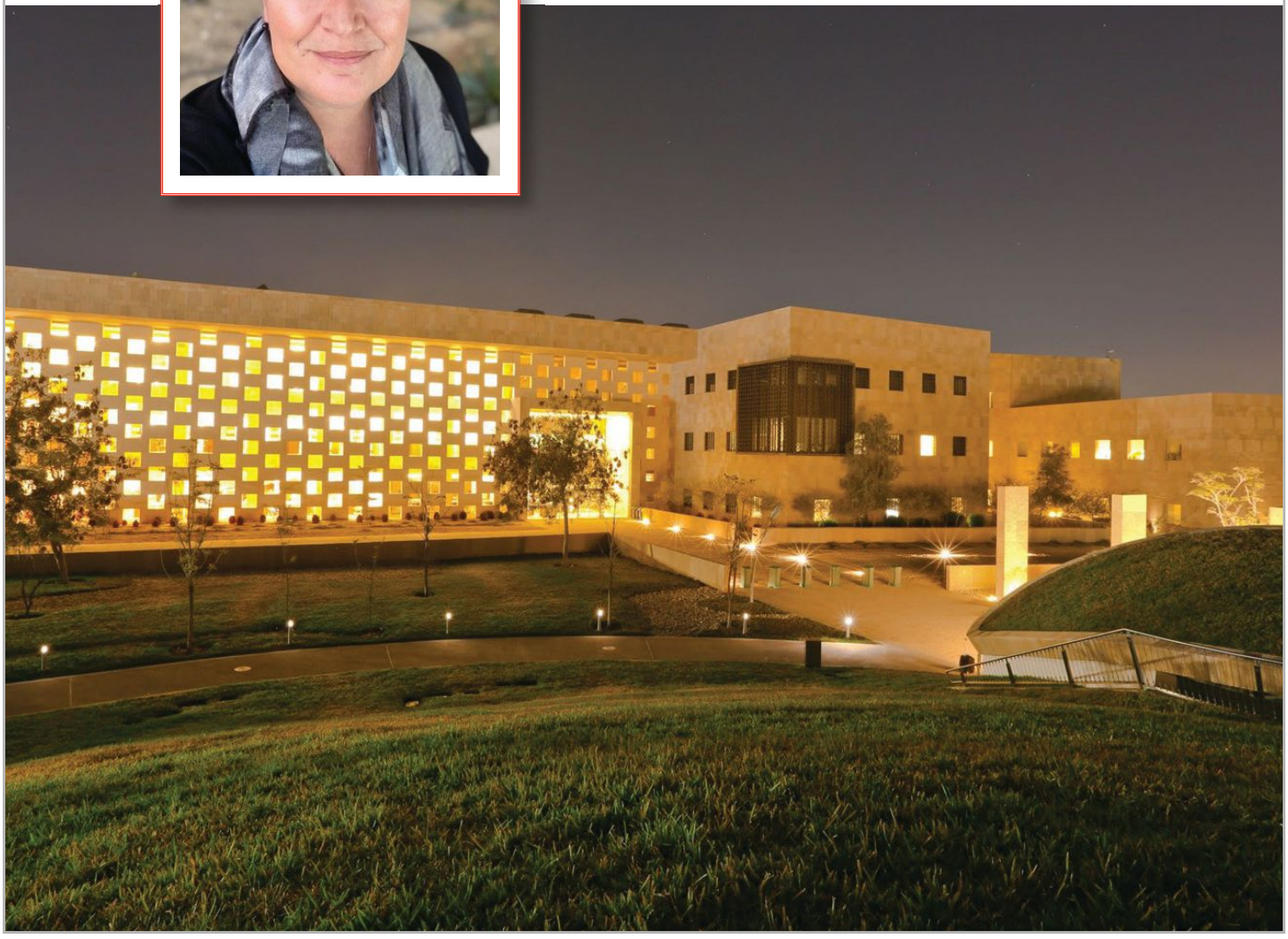
MY FACILITY

CLARE WAIT

Georgetown University Qatar

IFMA member Clare Wait's career has taken her in and out of the public and private sectors in all kinds of facilities. As chief facilities management officer for Georgetown University in Qatar, she oversees a high-performing building that must meet the needs of a vast number of diverse occupants in a hot desert climate.

Photos Courtesy of Georgetown University in Qatar



FMJ: ***Tell us about yourself and how you got into FM.***

WAIT: I have a bachelor's degree in building technology from the University of Manchester and a master's in emergency and disaster management from Georgetown University. After completing my undergraduate degree in 1993, I started with an engineering company in project management. I found the projects slow and long running. I was after a faster pace.

At that time facility management as a career was not established and our company was setting up a new FM department, so I was able to get in on the ground floor. FM was more interesting to me because in addition to handling large projects, it seemed to have multiple small projects going on at the same time. This engaged my multitasking skills and my hitherto undiscovered customer service skills.

I have a background handling different types of property and sizes. I began working in the U.K. managing public properties including schools, public housing, government and military establishments. From there I moved into the private sector at an airport and then pharmaceutical companies before moving to the Middle East.

In the Middle East I have worked in Dubai, Abu Dhabi and Saudi Arabia for a property developer, an airline and a new university, before relocating to Georgetown University in Qatar 10 years ago. Whether the site is large like King Abdullah University of Science and Technology (KAUST) in Saudi Arabia, which covers 36 square kilometers (14 square miles) or small, like GU-Q, which covers 40,000 square meters (430,556 square feet), I have found the issues to be the same, it is just a matter of scale.

MY FACILITY

>>>>>>>>>>>>>> CLARE WAIT
Georgetown University
Qatar

FMJ: ***What is day-to-day life like at Georgetown University in Qatar?***

WAIT: FM here has a broad remit covering the standard cleaning and maintenance, but also catering, transportation, events, bookstore, security, mail services and employee housing, so there is never a dull moment.

Our FM team represents 30 nationalities, including 25 directly employed staff and contractors and 95 Qatar Foundation (QF)-provided contractors for maintenance, cleaning and catering. This can be challenging when trying to build a cohesive environment, so we have paid particular attention to team building activities and rewards to build that sense of belonging in line with the GU values.

FMJ: ***Why is your facility unique and what kind of challenges do you face managing GU-Q?***

WAIT: We are lucky to have been able to start fresh in a brand-new facility built just for GU-Q, but it also came with the lengthy standard punch list to address during the building handover process.

GU-Q is based in a building provided by QF, the Humanitarium Building. I was hired three weeks before the Georgetown community began the transition into the newly designed building in September 2010. We were fully operational by the start of January 2011.

The design of the building reflects design elements from both the Georgetown University campus in Washington, D.C., and from buildings in the Gulf Region.

The Georgetown Building was officially renamed the Humanitarium Building by QF in 2017. The new name, a combination of the words humanities and atrium, which is a central feature in the building's design, honors the Georgetown community's role in the study of the humanities.

The Humanitarium hosts up to 700 people. We have around 400 students and when they attend in-person classes, there are about 16 students in each classroom. We host upwards of 700 events a year hosted by students, faculty and staff, including public lectures, panel discussions, academic and student conferences, as well as academic ceremonies.

Designed to be a major gathering place for faculty, students and staff, as well as visitors, the Atrium is three-stories high with skylights that allow natural light into the space. An area with dining tables and chairs sits adjacent to the dining services and is separated from the other casual seating area with a distinct architectural water feature. The space is often converted for special events and can accommodate a banquet with seating capacity for 250.

The flags representing the different nationalities of the students enrolled at GU-Q are prominently displayed along one perimeter of the atrium. In addition, metal lightning bolt sculptures drop down below each skylight making light dance across the space. This level of architectural and decorative detail can be a challenge to maintain when we have an operation that spans the full year and doesn't really break for the summer, which would be the traditional time for periodic maintenance.

The Auditorium is the preferred venue for larger events, including but not limited to lectures, panel discussions and artistic performances, with seating capacity for 350 people. Other spaces include The Centre for International and Regional Studies (CIRS), which is designed to host international conferences and meetings with various local and foreign delegations. CIRS is in an open courtyard within the academic wing. It contains a conference with custom-designed tables that form a circle to accommodate up to 40 participants. The classrooms, seminar rooms, lecture room and distance learning rooms form one of the major design features of the building. These rooms contain the latest A/V equipment to be used for instructional purposes. The distance learning room is equipped with "telepresence" technology to allow for distance learning between the Washington, D.C., and Qatar campuses, as well as the rest of the world.

The library offers flexible spaces that encourage individual or collaborative reading, studying and research, allows for the provision of research assistance, and skills training and support, and houses an extensive collection of books and materials, as well as a variety of assistive technologies.

The design architect's integration of open courtyards and spaces allows natural light to penetrate the building's interior. This feature ensures that there are hardly any spaces without natural light, including offices and teaching spaces. The use of water features both in the interior and exterior of the building contributes to the aesthetics and character of the building.

Having invested in such an iconic building, QF is keen to maintain the integrity of the design so there are limitations to the changes or alterations that we can make.

FMJ: ***How does the Qatar climate affect your FM strategies?***

WAIT: The climate in Qatar brings other challenges with the building management system and air conditioning, particularly adjusting for changes in humidity throughout the year. Occasional heavy rainfall can cause flooding and there was an incident in recent years when we had to respond rapidly to water ingress. Nevertheless, I am proud that the teamwork we cultivated carefully paid off, because we were able to respond quickly to mitigate the flood and prevent major damage.

FMJ: ***What is the biggest FM challenge you have faced and how did you find a solution?***

WAIT: In 2009, I led the response to the floods at my previous in which we rescued 200 households from the rising water after unexpectedly high rainfall. Just like during floods at GU-Q, teamwork, critical decision making and creative solutions helped us overcome this challenge.

When we moved into the GU-Q building one floor was left incomplete for our future expansion, and QF decided to use the space to host another university on a temporary basis. In 2011, the University College of London in Qatar moved in and we jointly oversaw a one-year fit out of that space while maintaining our operations and minimizing disruption.

Another challenge was supply chain disruption due to the blockade. In 2017, Qatar experienced breakdown in relations with neighboring countries, and the borders closed, significantly affecting our supply chains.

What are some FM challenges you face at GU-Q that are common across the FM industry?

WAIT: As with every other FM team in the world, right now our biggest challenge is providing a safe environment for our community to continue to operate during the pandemic. Members of the FM team were deemed critical for building operations and were among the few people placed on a preapproved list authorizing entry and work from the premises to continue operations through the lockdown.

FMJ: ***What do you like best about what you do?***

WAIT: I love the people I work with and the variety of the activities we work on, because however proactive you are, you never know what the day will bring.

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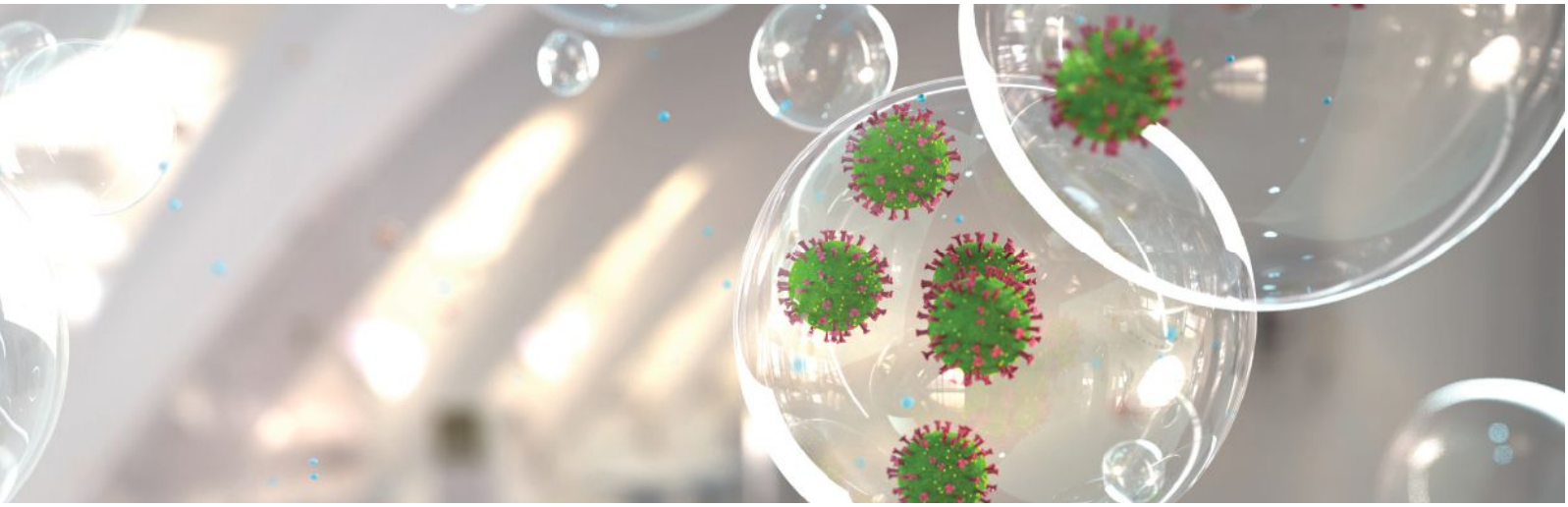
DR. MARILYN BLACK



As COVID-19 changed the world, facility managers adapted by learning ways to keep commercial tenants and staff healthier and safer. Understanding the science of how COVID-19 is transmitted and the importance of good indoor air quality (IAQ), helps mitigate the risk of infection and widespread sickness at schools, workplaces and residences. During 2020, data, misinformation and changing guidelines were presented, emphasizing the importance of having a clear action plan for maintaining commercial spaces.

WHAT IS AN AEROSOL?

Studies have shown that the SARS-CoV-2 virus, which causes COVID-19, can exist as an aerosol and be transported in the air. Aerosols are small solid, liquid (or a combination of both) particles suspended in the air. They have broad environmental impacts that include detrimental health effects because of their ability to be inhaled and deposited in the human respiratory system. Particles can be as small as a few nanometers (nm) to cloud drops of 50 microns (mm) or larger. The smaller particles tend to have greater adverse health effects because they penetrate deepest into the lung and in some cases, are small enough to pass through membranes and translocate to various organs and enter cells. The SARS-CoV-2 virus is small, ranging from 60-140 nanometers (nm).

COVID-19 AEROSOL TRANSMISSION

Any process that expels air from the nose or mouth will produce aerosol droplets. Coughing (approximately 3,000 droplets) and sneezing (approximately 40,000 droplets) produce the most. Talking for about five minutes is considered to produce a similar number of droplets as coughing; and sneezing expels the droplets at a high-speed forming a droplet cloud.

Because the virus infects the respiratory tract and can be spread by an infected person who generates liquid aerosol droplets into the air, transmission to the face, eyes, nose or mouth is higher. Turbulence in the surrounding air or the behavior of emitted droplets in one sneeze, as a cloud, can substantially increase the lifetime of the airborne aerosols. Direct air dilution from ventilation, however, can help reduce aerosol levels and remove them from indoor spaces. These droplets can also dry rapidly, decrease in size and eventually deposit on surfaces. Touch surfaces at that point can become contaminated.

VIRUS DROPLETS AND SURFACES

There are many factors for FMs to consider with SARS-CoV-2 transmission and commercial interior surfaces. In addition to airborne transmission, the virus aerosol can settle on surfaces and then be physically transported by touching contaminated surfaces. Ambient environmental conditions (e.g., relative humidity), variability in particle size and air flow patterns in the region surrounding the person emitting the aerosols make a difference in this complex process, and how quickly they settle on surfaces.

This raises the issue of how long the virus can live once it is deposited on a surface.

Research found that the virus' ability to survive from hours to days depends on the type of surface with longer duration of survival observed on hard surfaces. There are many factors like viral load, temperature, humidity and available sunlight that affect survivability. However, SARS-CoV-2 has been found to survive for up to 28 days on non-porous surfaces. An increase in tem-

perature reduces survivability significantly. This indicates the need to disinfect hard surfaces like vinyl, stainless steel, plastic and glass with frequent and consistent processes. These materials are often found on work surfaces, touchscreens, phones and other electronic equipment. Porous materials like cotton and other fabrics have reduced survivability because of their absorptive nature.

SAFER SCHOOLS AND WORKPLACES

The condition and safety of indoor air environments have never been more important for FMs and their building occupants. Schools and workplaces are often more crowded, and it is a challenge to maintain the recommended six feet of distance between people and to keep surfaces clean.

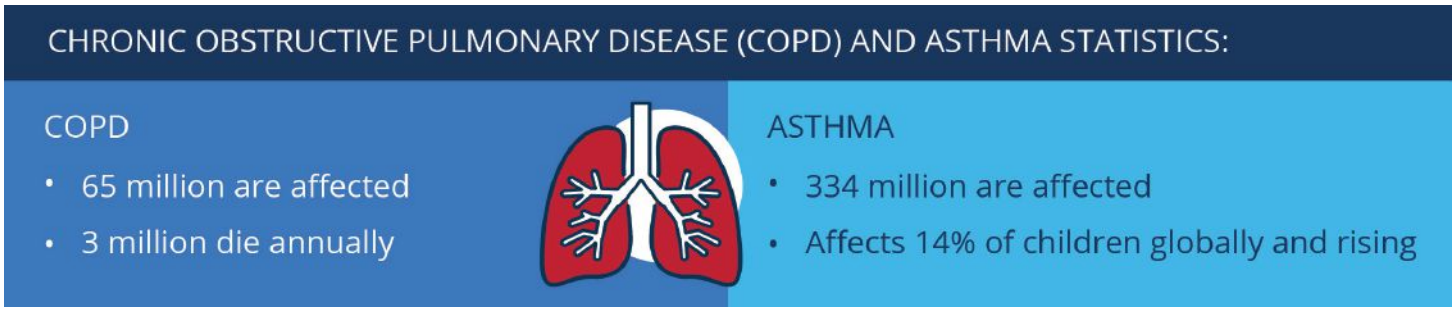
Chemical and particle pollutant levels indoors are typically two to 10 times higher than the surrounding outdoor air. Humans breath more than 15 thousand liters of air per day, consuming four times more air than food and liquid together. With the combination of crowded spaces and exposure to general indoor pollutants, this can make people more susceptible to viruses like SARS-CoV-2.

The good news is that in schools and businesses, FMs can take meaningful steps to manage IAQ. Good IAQ is not just about limiting the virus that causes COVID-19, but also general indoor air pollution to reduce respiratory and cardiovascular related health problems like chronic obstructive pulmonary disease (COPD), asthma and respiratory irritation. These can be exacerbated by common indoor air pollutants like volatile organic compounds (VOCs) and respirable particles emitted from processes like 3D printing.

IAQ TACTICS FOR COMMERCIAL SPACES

VENTILATION

Ventilation systems perform two key functions. They provide conditioned breathing air into interior spaces and they dilute and remove pollutants from the air. Effective ventilation and air purification tactics are key tools in preventing the spread of COVID-19. Many factors determine how long the virus droplets can remain in the air before being inhaled by someone else or eventually deposited on surfaces. For example, research found that at a 6-foot height, in still air, the virus-containing droplet can stay in the air for 40 minutes (with possible range of 10 minutes to two days.) This demonstrates the importance of optimum HVAC system performance with good air exchange, air mixing and filtration.



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Commercial buildings tend to have larger, more complex ventilation systems. These buildings should increase the supply of clean outdoor air as much as possible. Depending on the system, ventilated air may consist of outdoor air and recirculated indoor air. Single pass ventilation (100 percent outdoor air) is ideal, if possible, so that interior air is not recirculated. Air filtration is also important, so use filters with the highest MERV rating possible and place filters in return air plenums. In some cases, the use of ultraviolet light in the air plenums may help reduce the virus, but care should be taken to prevent occupant exposure. For small volume rooms, free-standing air cleaners with HEPA filtration may be effective in removing small particles.

For optimal IAQ, it is important to maintain 40 percent relative humidity or greater in an interior space, with 40-60 percent best for occupant comfort.

DISINFECTION MEASURES

Many commercial cleaning regimens require important disinfection plans, but these can cause harm and produce unintended consequences. Research shows that disinfection plays a role in preventing COVID-19 transmission, but it also has broader health impacts by degrading indoor health quality. Many disinfectants contain VOCs that evaporative into the air (alcohols, phenols, formaldehyde) that can cause short-term health effects including eye, ear, nose and throat irritation, headaches and nausea. Long-term health effects of VOC exposure include liver, kidney and central nervous system damage.

When considering a facility cleaning and disinfection plan, continue routine cleaning to avoid build-up of dust and settled films that may contain VOCs and other particles. Vacuum thoroughly with a HEPA filtration system, and focus disinfection on high touch surfaces (doorknobs, light switches, touchscreens, work surfaces and office equipment controls). When using disinfectants, only use those approved by the U.S. EPA and use them in well-ventilated spaces and where windows can be opened.

PRECAUTIONARY MEASURES

There are key precautionary measures to prevent the spread of COVID-19 into spaces. The most effective way to eliminate exposure to any pollutant or virus is, by what scientists call, source control. This is eliminating the contaminant altogether by not bringing it into a building.

Practically speaking, maintaining physical distance (at least 6 feet) from others and avoiding contact are proven an effective way to avoid the spread of COVID-19. Also, effective hygiene is wearing a face mask to prevent droplets spreading, washing hands often and not touching one's eyes, nose or mouth.

By understanding the science behind virus transmission, proper ventilation, disinfection and precautionary measures, FMs can enhance the quality of indoor air and decrease the spread of disease and ensure a safer, healthier tomorrow. FMJ

Dr. Marilyn Black *is vice president and senior technical advisor for Underwriters Laboratories, leading its research institute Chemical Insights. She is the founder and former chairperson for both UL Air Quality Sciences and the GREENGUARD Environmental Institute. She is also the founder of the Khaos Foundation, a non-profit organization dedicated to protecting the health and well-being of children through education and research. Dr. Black is an active participant in national and international scientific organizational initiatives, research projects and community outreach programs, and has presented and published more than 200 papers on indoor air quality and environmental exposure. She received a Ph.D. from the Georgia Institute of Technology, M.S. from the University of Florida and B.S. from the University of Virginia.*

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2. World Health Organization, Natural Ventilation for Infection Control in Healthcare Settings. Editor: Atkinson, J., Y. Chartier, C. L. Pessao-Silva, P. Jensen, Y. Li, and W. -H. Seto (2009), ISBN 978 92 4 154785 7 (NLM classification 167.)

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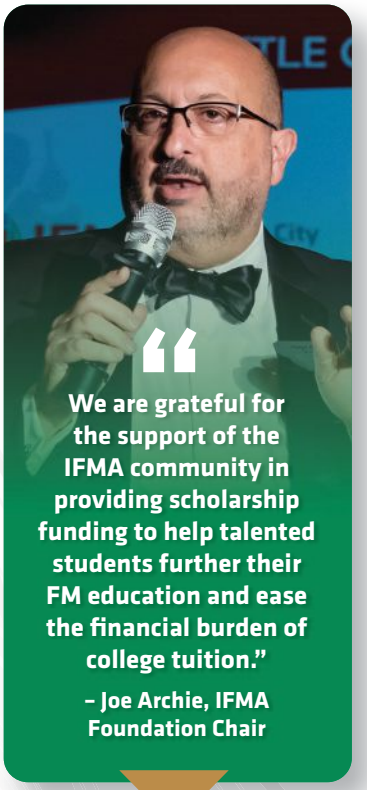

> **We are grateful for the support of the IFMA community in providing scholarship funding to help talented students further their FM education and ease the financial burden of college tuition."**
>
> **– Joe Archie, IFMA Foundation Chair**

2021 IFMA Foundation Scholarship applications are available online.

Student Scholarships available for individuals seeking a facility management (FM) degree or a degree in the built environment. Any students seeking a career in FM or related field are encouraged to apply.

Through the generosity of IFMA Fellow Eric Teicholz, the IFMA Foundation is offering scholarship opportunities to individuals interested in earning their Sustainability Facility Professional® (SFP) in 2021.

To learn more about foundation scholarships, visit **https://bit.ly/3aSfhgX**

IFMA Foundation appreciates the support of the IFMA Chapters, Councils & Communities for their sponsorship towards scholarships.

If interested in impacting the life of a future FM leader, **Contact Program Support Specialist Christina Gonzales at christina.gonzales@ifma.org to learn how to become a sponsor.**

SAVE THE DATE

IFMA Foundation Virtual Fundraiser
Wednesday, April 21, 2021 at 5 pm CST

Join us for a fun interactive virtual event that promises a virtual good time while supporting the vision of the IFMA Foundation. To live in a world where FM is a career of choice inspiring and shaping the built environment. Registration is open at **https://bit.ly/3qgdZms**

Digital FMG badges are currently available to graduates of the Facility Management Accredited Degree Program free of charge. Graduates can also get 1 year free Young Professionals membership. Degree holders can apply for their badge with IFMA by filling out a form online at **www.ifma.org/my-account/camp**

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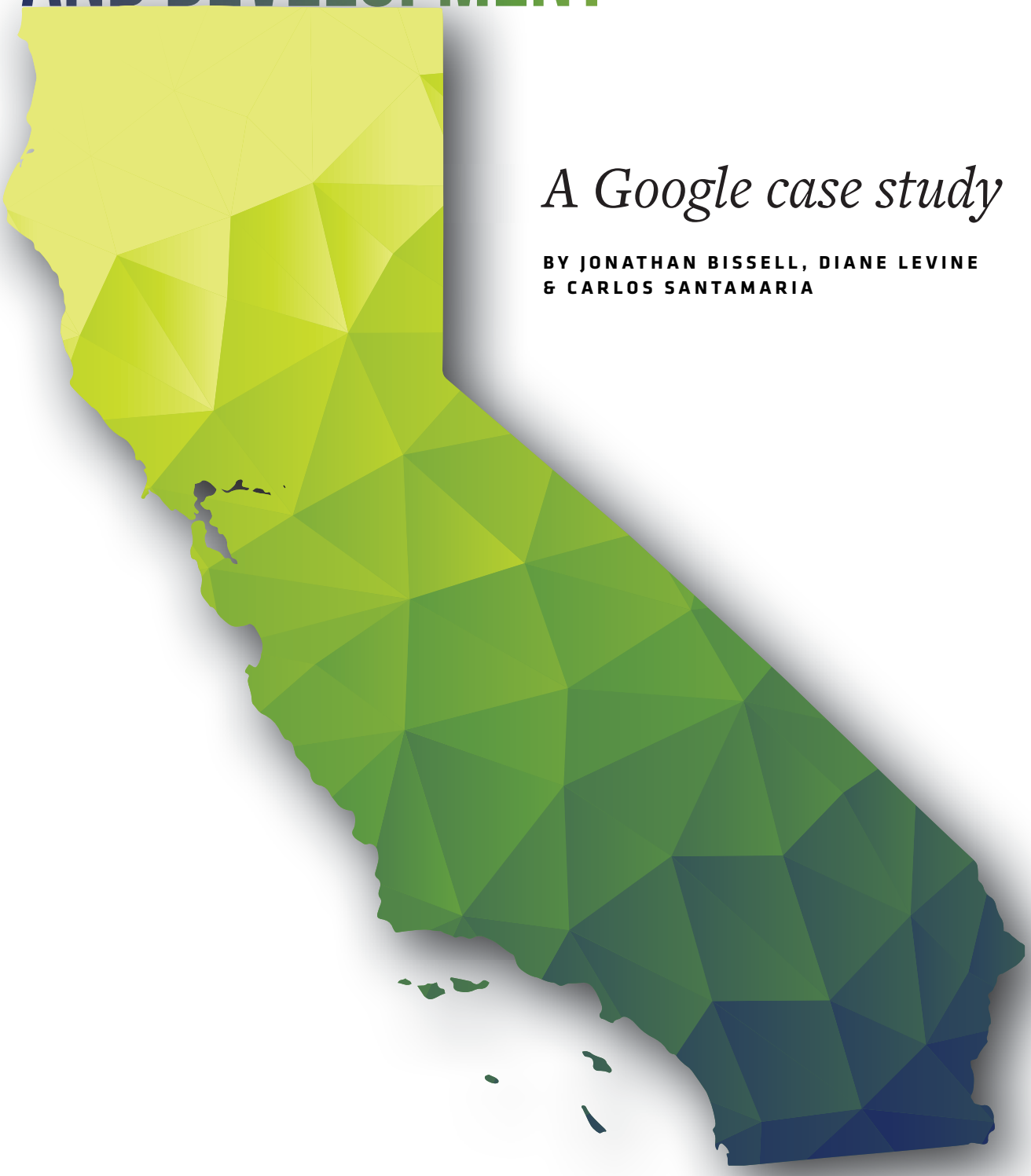

A Google case study

BY JONATHAN BISSELL, DIANE LEVINE & CARLOS SANTAMARIA

While the role of the facility manager is evolving, how can the industry ensure FM teams are best positioned for the change and the disruption that is ahead? And how does industry keep up with relevant and evolving skills? FM leaders have sought better ways to quickly upscale their teams and to keep up with trends, technology solutions and emerging hybrid workplaces.

The IFMA Foundation with California Community Colleges, the San Mateo County Community College District, Google and Cushman & Wakefield created an innovative partnership to solve this problem.

PARTNERING FOR SUCCESS

For 30 years, the IFMA Foundation has worked to fill the looming FM talent gap in facility management and upskill FMs. The average FM is 49 years old, and in the next five to 10 years, half of the existing FM workforce will retire. Among the Foundation's major functions is connecting the FM community with business, government agencies, economic development, academic institutions and community organizations. The FM Contract Education program connects Google, Cushman & Wakefield, the California Community Colleges, their energy, construction and utility sector, as well as the San Mateo County Community College District's CCCE Corporate Training Solutions.

This partnership created a differentiated experience for Google and Cushman & Wakefield, formed teams and made their work meaningful, magical and memorable for their organizations. Because of its success, this program was recently named a top 10 partnership in industry and education at the California Economic Summit.

WHAT IS CONTRACT EDUCATION?

Contract Education is the training arm of California Community Colleges. It provides rapid and responsive training for local, regional or global public/private employers based around employer needs, goals and desired results. In the FM context, Contract Education incorporates a tailored discovery process benchmarked with IFMA competencies, as well as training design inclusive of case studies, discussion, role play and thought-provoking activities leading to great outcomes and upskilling core FM competencies for leaders and teams.

CONDUCTING THE SKILLS GAP ANALYSIS

When the Foundation and the state, college and industry groups were presented with an opportunity to train FM professionals at Google, the group wondered how it could train an organization that has some of the most innovative practices.

The Foundation identified the opportunity within this group and found the added value to how Google FMs conduct their daily routine. Exploratory meetings were held with Google FMs to learn how the team works and identify problems areas where they were experiencing challenges in communication and productivity. Later, the training team conducted a skills gap exercise with approximately 20 Google team members holding different positions. The exercise included the facility maintenance team, technical mechanics, technicians and other operations team members for discussions on real-life operational scenarios and gaps in the process and workflow.

The result was a robust conversation about what the FM team did, their challenges, and their ideas of improvements within their area of responsibility.

Following the skills gap exercise, the team used the core competencies from the IFMA Foundation Training Framework and identified key skills based on responses from the Google group. These areas included cleaning operations, securities, maintenance, construction, service operations and more. A matrix and additional questionnaires were developed to discover high and low priorities.

Important workflow stoppages and communication breakdowns

causing time delays, unhappy customers and poor teamwork were identified.

The exercise included asking the Google team about making improvements on their daily activities. This led to an open and trusting discussion that identified important key facts that assisted in the course development. The participants' feedback suggested that the discussion motivated the facilities team members, as they felt that their suggestions mattered. Specifically, the dialogue between Cushman & Wakefield and the Google team showed ways to increase collaboration between departments.

CAMPUS AS A LIVING LAB

Part of the training included an on-site campus as a living lab exercise to provide an experiential learning take away for the FM team. Organizations such as Google have employees who, in their normal course of work, may never see the backroom equipment or problematic systems such as the HVAC systems along with controls and roof equipment. This is a great opportunity for FMs to better understand how the building is operated.

At the end, FM teams and individuals better understood the other roles and responsibilities of other team positions, which created a better understanding of how they could perform their job more effectively. In this case, it was not that the technical skills were lacking, it was an overall awareness of other positions and skills that allowed for better collaboration and increased customer service. There were some opportunities to improve ways that they could communicate with one another.

FACILITY MANAGEMENT SKILLS ACADEMY (FMSA)

Training is often used as a hammer to drive in the nails. For training with Google and Cushman & Wakefield, however, a broader and more contextualized approach that envisioned a series of trainings conducted over a longer period to upscale employees was needed. This approach was called the Facilities Management Skills Academy (FMSA) and identified three primary areas of focus: job development, career development and Google development.

Job development focused on helping employees get better in their specific jobs and roles. Career development focused on helping employees develop their career context on either the Google or the Cushman & Wakefield team. Google development focused on helping employees develop within the Google way in their role and career. The acronym RAVES (Retention, Advancement, Visibility, Engagement, and Service and Savings) captures the academy's long-term benefits for the Google and Cushman & Wakefield teams.

A prework survey gave the Foundation a better sense of the perception of roles and responsibilities within the organizational chart of each team, to pinpoint focus areas for visibility training, cross training, onboarding, customer service and career development.

A campus as a living lab concept was put in place, connecting classroom theory with hands-on experiential learning, and helping employees complete the world-recognized Facility Management Professional™ (FMP®) credential. The pilot used one curriculum to serve both the Google and Cushman & Wakefield teams. Although each team had different goals, perspectives and day-to-day tasks, the pilot was tailored to match each team's needs.

Early in the training the teams worked through an exercise using the flywheel concept from Jim Collins' book, "Good to Great." The flywheel process helps teams translate past successes into future wins by creating compound momentum around the core elements that drive their success. For the exercise, each team developed their flywheel and identified what a 10 out of 10 rating might look like for each element of the flywheel.

The flywheel exercise also helps teams understand the why behind everything that makes them successful. Teams that know their why can better communicate and integrate their purpose into their cultural DNA, and they understand how even the smallest tasks feed into the larger picture and results. The why also influences onboarding. Instead of onboarding with information, teams can onboard new employees with the why of their flywheel and provide the employee with context for everything they learn. This enables them to be more successful over the long term for the team and organization.

The pilot provided interactive training modules in effective communication, effective customer service, critical thinking and decision making, teamwork and continuous improvement. Teams also learned about the five dysfunctions of a team, creating team rituals and much more.

This educational program was transformative for the Google FM team. They built innovative capital and unlocked the resources to make ideas happen and created the ability for others to believe in the ideas they unearthed, as well as unexpected insights that increased their productivity. This program ensures that the Google and Cushman & Wakefield FM team is positioned for future change and disruption while enhancing the human experience in the workplace. FMJ

THE RESULTS

Many participants in the pilot received promotions following the training.

In the FMP portion of the training, the teams learned leadership lessons beyond technical knowledge. Lessons included doing the right thing versus doing things right, thinking across the organization, using quantitative data to make qualitative decisions, recognizing the correlation of customer experience data and operational data to plan proactively and reduce unplanned maintenance costs, looking at the data to understand what it is saying and what to do about it, understanding root causes and much more.

Some key takeaways from this transformative training program are:

THINK STRATEGICALLY: How are you trying to move the business goals of your organization? How can you impact performance of your team? What are the metrics you are trying to increase or change?

MAKE IT CUSTOMIZABLE AND ADAPTABLE: Customize on the front end to adapt as you go. Revise your approach based on real-time situations and learn from the participants being trained. Make adjustments for what is most valuable to them.

ENGAGE THE ENTIRE TEAM: Make sure you get feedback and make it a collaborative process.

DON'T JUST DELIVER TRAINING, DELIVER AN EXPERIENCE: Help people walk away better equipped to support each other and learn things that will last throughout their entire careers.

USE THE CAMPUS AS A LIVING LAB: Make the training experiential and immersive, one that they will never forget. Help them see how each team operates. This is a great way to model those teams and individuals that normally would not touch building systems to better respond to customers.

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MAKING FM A CAREER OF CHOICE

Jonathan Bissell *is executive director of Community, Continuing and Corporate*

Education Corporate Training Solutions with the San Mateo County Community College District and is a seasoned leader with expertise in designing and delivering training to organizations. He is a certified contract trainer and certified executive coach, as well as a recipient of the 2020 Star Performer award for Leadership by the California Community College's Contract Education Technical Assistance Provider and the 2020 IFMA Foundation Award of Excellence. He has a master's in Applied Linguistics from Teachers College, Columbia University.

Diane Levine, *MCR, IFMA Fellow, is the executive director of the IFMA Foundation.*

She is a former IFMA board member, and also an award-winning co-editor and author of the "Work on the Move" book series. Diane is one of the pioneers of the foundation's Global Workforce Initiative.

Carlos Santamaria *is an industry professional with more than 25 years of*

experience in the commercial real estate industry. Santamaria completed his BA at Saint Mary's College, finishing his graduate studies at the University of San Francisco with an executive MBA. He is a licensed real estate broker, a certified LEED professional and a Real Property Administrator. He teaches at various community colleges and has instructed and has developed industry training programs for over 15 years both in the United States and in China.

ACCREDITED DEGREE PROGRAMS

SCHOOL NAME: Ferris State University, Big Rapids, Michigan, USA

FM-RELATED DEGREES OFFERED: Bachelor of Science in Facility Management; Minor in Facility Management; Certificate in Facility Management; Dual Degree – BS in Facility Management and BS in Architecture and Sustainability

IFMA AFFILIATION: Since 1996 Reaccredited 2002, 2008 and 2014

FERRIS STATE UNIVERSITY

WHY AND WHEN WAS THE PROGRAM INSTITUTED?

The bachelor of science in facility management degree at Ferris State is one of three programs housed within the Architecture and Facility Management Department. It was established in 1989, as a junior- and senior-level complement to the architectural technology associate degree. Consequently, it is rooted in a strong foundation of architectural technology, which gives program graduates a broad understanding of how buildings are created and how they operate. Students begin their education with the two-year associate in Applied Science in Architectural Technology program and ladder into the BS in Facility Management program, which can be completed in four semesters, with one summer internship between the junior and senior years.

DOES YOUR DEPARTMENT TEACH ANY OF THE IFMA CREDENTIALS?

Our course outcomes intentionally address attainment of professionalism that includes both soft and technical skills; as well as achievement of the IFMA core competencies to varying degrees. The graduates of our program demonstrate a wide range of professional knowledge, addressing the real-world concerns and challenges within the profession of FM, as outlined in the IFMA core competencies.

WHAT TYPES OF PRACTICAL APPLICATIONS DO YOUR STUDENTS LEARN?

Our FM program focuses on producing graduates who can assist organizations in all aspects of planning and managing the design, construction and operation of their facilities, with consideration given to people, process, place, and technology. Hands-on experiences and practical applications are an integral component of the program. FSU teaches students space planning, programming, operations and maintenance planning, asset management, move management, project management, real estate development and management, life cycle cost analysis, value engineering, FM-related software, BIM and more. Our students recently engaged in an in-depth evaluation of ADA compliance of campus structures, requiring them to take detailed measurements of numerous conditions related to accessibility, and explore solutions that would comply with principles of universal design. Students have also been engaged in building diagnostics projects involving performance evaluation of building systems: studying illumination level, heat loss/gain with the use of different measuring devices (light meters, thermal infrared cameras, heat flux sensors) as well as virtual thermodynamic models. Students reinforce classroom concepts and apply their knowledge and abilities in their internships.

TELL US ABOUT YOUR FORMER STUDENTS AND WHAT THEY HAVE GONE ON TO ACCOMPLISH.

Graduates of FSU's facility management program at have risen to leadership roles in a diverse range of fields: health care; public utilities; higher education; government agencies like the U.S. State Department, General Services Administration and National Park Service; and corporate organizations such as Dow Chemical, General Motors, Domino's Pizza, Hyatt Hotels and Haworth. Appropriate for a hockey-crazy university, one graduate recently earned national recognition for managing the best hockey arena in the country, in a competition sponsored by Kraft and the NHL.

WHAT COURSES ARE OFFERED?

Major

FMAN 321	Principles of Facility Management	3 cr
FMAN 322	Project Management	3 cr
FMAN 331	Facility Programming & Design Process	3 cr
FMAN 332	Digital Applications in Facility Management	3 cr
FMAN 393	Facility Management Internship	4 cr
FMAN 431	Principles of Space Planning	3 cr
FMAN 432	Principles of Interior Architecture	3 cr
FMAN 441	Property Development & Planning	3 cr
FMAN 451	Planning & Budgeting for Operations	3 cr
FMAN 489	Capstone Research	1 cr
FMAN 499	Capstone Thesis	3 cr

Technical (Outside Major)

BLAW 301	Legal Environment of Business	3 cr
HVAC 483	HVACR Building Systems	3 cr
MGMT 301	Applied Management	3 cr
MGMT 350	Mgmt. Metrics & Decision Making	3 cr
STQM 260	Introductory Statistics	3 cr
MGMT elec	Management Elective	3 cr

Communication Competency

COMM 105	Interpersonal Communication OR	3 cr
COMM 121	Fundamentals - Public Speaking	3 cr
ENGL 150	English 1	3 cr
ENGL 250	English 2	3 cr
ENGL 311	Advanced Technical Writing	3 cr

Culture Competency

ARCH 244	Architectural History 1	3 cr
ARCH 245	Architectural History 2	3 cr
----------	Cultural Enrichment Elective	3 cr

Quantitative Competency – Complete 1 course

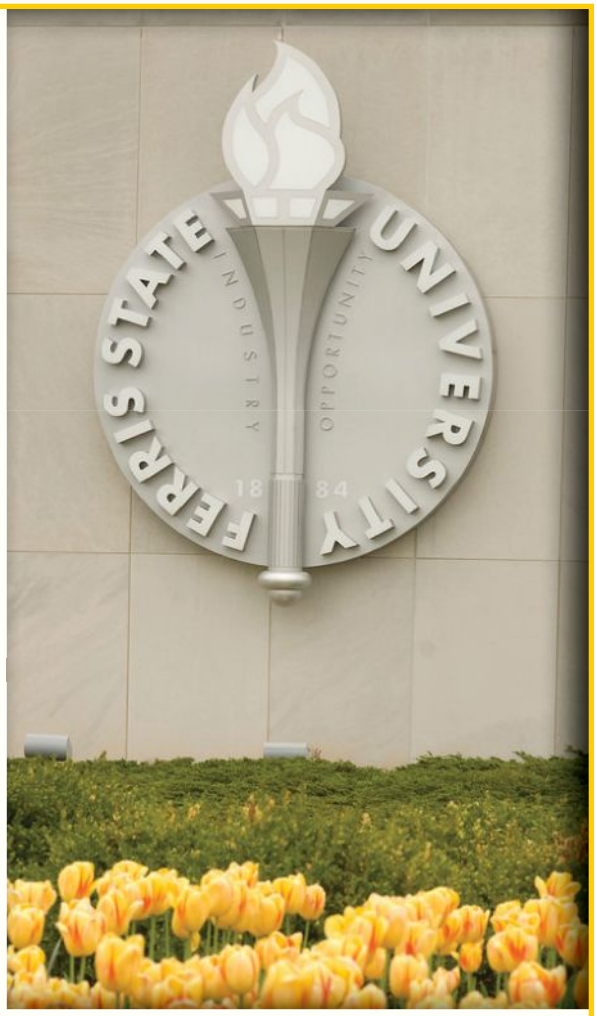
MATH 116	Intermediate Algebra / Numerical Trigonometry	4 cr
MATH 120	Trigonometry	3 cr

Natural Sciences – Complete 2 courses (including 1 lab)

PHYS 211	Introductory Physics 1	4 cr
----------	Scientific Understanding Elective	3 cr

Self & Society

ECON 201	Principles of Microeconomics	3 cr
ECON 202	Principles of Macroeconomics	3 cr
----------	Social Awareness (foundation course)	3 cr



WHAT KINDS OF RESEARCH IS YOUR DEPARTMENT CONDUCTING AND WHAT ARE YOU MOST EXCITED ABOUT?

The research conducted in our program covers a wide range of topics within the FM scope of work, including performance-driven design, energy-efficient smart building solutions, energy management modeling, renewable energy resource system, predictive operational optimization control model and more. We focus on research ideas that address the current practices, concerns and challenges within the FM profession.

WHAT ARE THE ISSUES FACING THE NEXT GENERATION OF FMS AND HOW WILL THEY BE ADDRESSED?

COVID-19 has introduced numerous challenges into the workplace. To better understand those challenges, students this year were asked to reconceive their academic setting to facilitate learning in a safe way. Building management technology continues to evolve, so a new course has been added to the FM curriculum, specifically to introduce students to software that will address the increasing complexity of project and facility management.

WHAT ARE THE ACCOLADES OF YOUR ACADEMIC STAFF?

Our faculty members come from a variety of backgrounds and bring experience from education, research, and many years of hands-on industrial and professional practice. They stay up-to-date in their discipline through scholarly and professional development activities; to ensure their professional knowledge and insight in the delivery of coursework.

TELL US ABOUT YOUR INTERNSHIP PROGRAM AND WHAT IT OFFERS TO THE STUDENTS.

Our summer internship program provides real-world experience for the students. During the summer between the third and fourth years, students spend a minimum of 10 weeks working at approved internship sites throughout the U.S., for a variety of corporations, universities, health care institutions, and government agencies, gaining valuable skills and knowledge. Employers agree to provide these students with engagement in a range of practical tasks including interior installation, operations and maintenance, long-range planning, budgeting, and software applications. Recent internship sites include General Motors, Marriott Hotels, Amway Corporation and Steelcase. FMJ

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FMJ What research or product innovations is Schneider Electric working on that will help FMs be more successful in their roles?

SE The building industry is changing, and it is now more important than ever to empower building developers, owners and operators with the right solutions to create more sustainable, resilient, efficient and people-centric buildings. Today, buildings are responsible for 40 percent of CO_2 emissions and 30 percent of energy in buildings is wasted with how often we are heating, cooling, and lighting empty spaces. This is one of the reasons why we are rethinking the way buildings are designed, built, operated and maintained. Through our EcoStruxture solutions we help FMs modernize and future proof their building management infrastructure by securely connecting hardware, software and services.

Adding to this change, COVID-19 has pushed the occupant experience and safety to the forefront. Now more than ever, people are demanding that the buildings they are in are safe, with an increased focus on air circulation, ventilation and occupancy monitoring. Our healthy building initiative gives facility mangers the power to assess, analyze and act on key occupant experience factors. Analyzing data across buildings allows managers to prioritize areas with the lowest health scores or out-of-range indicators and tracking the variability of such parameters gives teams the power to identify recurring issues and opportunities for predictive maintenance.

FMJ What's on the horizon in your field/industry, and how are you meeting those challenges and opportunities?

SE One of the ways we're meeting the needs of Buildings of the Future is ensuring that our key stakeholders, like facility managers, are able to optimize their buildings at every stage of the building's lifecycle. We recently announced an extended partnership with Planon to jointly deliver software and services that support the digitization of buildings by bringing granular building IoT data into real estate and facilities work flows. The combined offering enables building data, such as alerts on HVAC faults, to be fed into Planon's platform to trigger pre-defined business rules that automate directed interventions. This type of automation and self-healing will truly change how buildings are managed in the future.

We are also jointly investing in research and development to deliver a suite of smart services to digitalize the building lifecycle for both existing and new buildings. Facility managers are just one of the groups that will benefit from this partnership and the resulting innovation. Facility managers will be able to exceed service agreements by proactively addressing potential issues before occupant complaints arise.

FMJ How do you see the role of the facility manager changing in the future?

SE The role of the facility manager is so critical, complex, and already broad in scope. In the coming years, we see it becoming even more critical. Even before the pandemic, 90% of our time was spent in offices, hotels, homes, and more. Now more than ever, people are demanding that the buildings they are in are safe, making health and wellness a priority. As people return to work, the main challenge will be rebuilding confidence. Without it, efforts to jump-start economic growth and boost productivity will falter. Smarter buildings are key to creating healthier, more productive workplaces, improving profitability and protecting the planet.

As such, even after a pandemic has receded, identifying and reducing occupant health risks remains a critical and necessary function of building operations teams. Carrying out this function successfully requires having an effective facility management program, as well as the right technology tools. Facility managers will be forced to work even more closely with partners throughout the building lifecycle to meet ever-changing technology needs. From building management systems to associated smart building technologies, these tools will play a central role in helping facilities managers identify threats, reduce risks of infectious disease transmission, and monitor for policy compliance.

CASE STUDY

Using government collaboration to keep COVID-19 at bay

BY JOHN C. WANG

Some of the countries that are keeping COVID-19 under control come surprisingly close to the epicenter of the pandemic. A great example of this is the collaboration between government and the private sector in Taiwan, an active tech-driven economy right off the shores of China, where the virus originated.

As early as April 2020, a leading oil producing company in Taiwan, established business continuity plans following government guidelines, and since then have managed to fend off viral attacks and kept its employees safe. Many of the corporate programs related to facility management remain relevant.

The COVID-19 pandemic poses a great challenge to humanity and requires everyone to adapt to the new conditions. In the workplace, where most of the population spends close to a third of their time there is a flux of dynamics between the public and private sectors, represented by the government and the enterprise, respectively. When the two are able to align and collaborate, there is maximum effectiveness in their joint actions.

THE CONTEXT

Although Taiwan is situated in Far East Asia, its economic and political system is similar and relevant to the leading West ern societies. Its population and climate are similar to the state of Florida in the U.S. Its per-capita GDP ranks similarly with Germany and Sweden. Taiwan people directly elect their president, and are governed by a political system dominated by two strikingly contrasting parties.

The private sector of Taiwan boasts many of the unsung heroes behind global tech brands and is no doubt an active contributor to the global economy.

While Taiwan is less than 1,000 kilometers (600 miles) from Wuhan, China, the epicenter of the COVID-19 pandemic, it has managed to keep the total number of infections under 1,000 and deaths just seven (as of Jan. 1, 2021). There has not been a lockdown throughout the pandemic. People have been going to the office as usual, with no more than a handful of health precautions. These mild control mechanisms can serve as good references for enterprises around the globe, after the peak of the pandemic.

TOP-LEVEL GUIDELINES

As early as March 5, 2020, the Taiwan government issued a document titled "Guidelines for Enterprise Planning of Business Continuity in Response to the Coronavirus Disease 2019 (COVID-19)." The paper recommends the following business response strategies when the infections are sporadic:

I. Actively encourage employees with fevers or acute respiratory symptoms to stay at home and rest.

II. Personal and workplace sanitation management for employees with fevers or acute respiratory symptoms.

III. Advocating proper cough etiquette and hand hygiene.

IV. Regularly clean the environment and maintain good indoor ventilation.

It goes further to lay out guidelines in case the situation exacerbates with continuous or widespread community viral transmission:

I. Implement personal and workplace hygiene management.

II. Implement environmental epidemic prevention measures when confirmed infection case(s) exist within the company/enterprise.

III. Adjust work hours, office hours, attendance or business trips to reduce cross-transmission between employees.

Additional detailed recommendations for implementing the guidelines are provided in this 22-page document. Some examples are included below.

1. Devise employee health monitoring plans and track abnormalities, including health monitoring surveys, conduct outine temperature checks, inquire about respiratory symptoms and assist mployees in seeking medical attention.

2. Establish clear rules on visitation and make alcohol-based hand sanitizers available for visitors; and devise health urveys for visitors upon entry. Visitors with risk should not be allowed to enter the work site.

3. Enforce resting at home for sick employees. Require employees to adhere to cough etiquette and to wash hands regularly. Companies should provide contactless trash receptacles.

4. Regularly clean the office environment and maintain good air ventilation.

5. Employees who develop fever and respiratory symptoms during work hours should report to their supervisors immediately, wear face masks, be transferred to an individual space and seek medical attention.

6. Schedule daily sanitization carried out by trained employees or contractors. Surfaces including table tops, chairs and floors are to be sanitized with a bleach solution or approved cleaning agent.

7. Employees who shared space with a confirmed case but have been approved to enter the workplace are required to wear face masks and required to wash hands regularly.

8. Implement flexible coordination of the workforce, establish off-site working mechanisms, reduce the number of concurrent workers and investigate the feasibility of work from home.

9. Adjust working space to maintain proper distance between seats, implement spatial segregation between employees, clients and collaborating parties.

10. Obey government-issued travel advisories, cancel unnecessary overseas business trips.

11. Cancel or delay large-scale assemblies or conferences and consider alternatives. Encourage employees to refrain from participating in mass events and activities.

12. Conduct job function cross training, so that business operations can be maintained when staff are on leave.

13. Employers should provide flexibility when employees need to stay home to take care of children at home due to possible school closure.

14. Utilize digital communication tools for continued sales and marketing operations. Negotiate with clients to extend delivery period. Negotiate with financial institutions for extension of grace period on interest payments.

The guideline also required employers to observe all regulations concerning personal privacy and confidentiality during the process.

BUSINESS CONTINUITY PLANNING IN THE PRIVATE ENTERPRISE

Following the government-issued guidelines, Taiwan's leading petrochemical enterprise with nearly 16,000 employees and 500 field offices, produced its business continuity plan, which became a widespread case study model promoted by the government. In an online video clip, the company described its implementation with the following highlights:

1. **Employee awareness and training**
   a. Deploy digital signage to provide relevant and updated information.
   b. Provide ample personal hand sanitizer.
   c. Promote social distance for employees both indoors and outdoors.
   d. Promote wearing face masks when proper distance cannot be maintained.

2. **Visitor management**
   a. Limit building entrances and exits to ensure all visitors are screen and managed.
   b. Monitor body temperature for visitors and employees using long-range sensors.

c. Conduct travel history survey for employees, contractors and visitors.

d. Require health declaration for contractors and visitors.

3. **Health risk management**

a. Require high-risk workers to follow quarantine procedures. Track and monitor employees with abnormal body temperature.

b. Conduct teleconferences for meetings involving 30 or more people.

c. Postpone non-essential training. Change to online training if possible.

d. Spread out elevator traffic by controlling floors of access.

4. **Remote work management**

a. Prepare for work from remote locations.

b. Set up secondary work location as emergency backup.

c. Isolate primary and secondary managers to avoid both being sick at the same time.

d. Provide secure network access from home (VPN).

5. **Factory management**

a. Essential workers who must be physically at the factory to perform work must be assigned shifts and only be allowed in at specified time.

b. Keep tight control of over-time work to minimize overlapping. Use auto mated scheduling tools and display schedule information clearly.

It is quite clear that technology is expected to deliver many of the solutions to help manage the workplace.

IMPLEMENTATION WITH FACILITY MANAGEMENT TECHNOLOGY

From this case, it is apparent that technology plays a central role to help tame the pandemic. The tools are so effective that it can be expected that months, even years, after the world lifts lock downs and returns employees to work, most of the mechanisms will remain to reduce the risk of spreading any remaining infections. They are summarized below.

Digital signage for improved corporate communication — the dynamic nature of digital displays makes them well suited for announcing up-to-date information and effective at drawing attention. They can be conveniently deployed at building entrances/exits and near elevators to provide vital and regulatory guidelines.

Visitor management with personal identification and surveying — automated kiosks with employee badge readers can speed up entry and exit control for office buildings. The system keeps records of visitors, counts and limits the number of people present at the same time, and can collect health and travel history surveys.

Body temperature scanners for speed and safety — automated thermal cameras speed up the scanning of visitors upon their arrival, and avoid the risk of contact when using handheld temperature scanners.

Online conferencing to replace meetings and training — whenever possible, conduct conversations over electronic means to avoid physical contact.

Workplace scheduling tools and display — presence at the workplace or at meetings for essential workers must be tightly managed with scheduling tools so total occupancy of space can be managed, and later contact tracing is possible.

CONCLUSION

The case study in Taiwan demonstrates how a vibrant economy so close to the source of the pandemic managed to keep itself safe from the crisis. The process started from high-level government guidelines and progressed through private enterprise efforts.

By utilizing technology to assist in streamlined risk-prevention processes, large enterprises are able to manage their facilities effectively and keep occupants safe and productivity mostly in tact.

Step-by-step, this joint effort between the government and the private sector may serve as a valuable example of how the rest of the world will be able to reopen for a full recovery. FMJ

John Wang *is co-founder and CEO of IAdea Corporation, a company focusing on transforming the world with digital signage and FM hardware technologies. Passionate about the current and future development of the digital signage industry, Wang serves as the vice chairman of the Digital Solutions Multimedia Asia (DSMA), a non-profit industry group comprising of more than 200 companies throughout Asia. In 2018, he was recognized with the Outstanding Individual honor at the Digital Signage Awards for his contribution in promoting uses of digital signage technology around the globe.*

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HYGIENE IN THE WORKPLACE:

Using Science to Inform Practice

BY DR. EUGENE COLE

Whether conducting routine business, dealing with the challenges of a localized outbreak or global health crisis, facility management teams are responsible for ensuring healthy indoor environmental quality across their properties. This includes identifying risk reduction strategies for infectious agent transmission, regardless of the facility type.

An effective risk reduction strategy requires the adoption of two key science-based practices: health-based cleaning and occupant hygiene.

PRACTICE 1: HEALTH-BASED CLEANING

Gone are the days when anyone could simply look at a surface to assess its cleanliness. Many applied, scientific research studies in various workplace environments have shown the need for health-based cleaning that targets high-contact touch points or "hot spots," which may serve as vehicles of infectious agent transmission to uninfected individuals.

This targeted hygiene approach typically involves manual detergent cleaning of nonporous surfaces, followed by the application of an approved disinfectant. Health-based cleaning is promoted globally through many international organizations including the ISSA, BSCAI, IICRC and CIRI, among others.

What the Science Says

Many studies have been published on pathogen transfer between hands and surfaces, and on microbial pathogen survival on skin and surfaces. Disease can occur when contaminated fingers touch the mouth, nose or eyes. One particular study showed that a hand contaminated with a virus can contaminate up to seven other surfaces.[2]

When anyone touches an object, they transfer organisms to that surface and/or accumulate more organisms on their hand. In a crowded environment, a surface contaminated by one person can be touched by many others who then touch other surfaces as they move around. Each of those contaminated surfaces can be touched again by other people, and so the touching and contamination process continues.[2]

A major review of the significance of fomites (inanimate objects and materials) in the spread of respiratory and enteric viral disease, confirmed that both porous and nonporous surfaces or objects can become contaminated with pathogenic microorganisms and serve as vehicles of transmission[3]. It stresses that disinfection of fomites may interrupt the spread of noroviruses, coronaviruses and rotavirus. Researchers concluded that a large portion of respiratory and gastrointestinal illnesses can be prevented through improved facility hygiene, with emphasis on better surface cleaning and disinfection, along with effective hand hygiene practices.

The Importance of Cleaning

Science supports the fundamental approach to reducing the risk of infectious agent transmission is the process of cleaning. Clean is a condition free of unwanted matter and cleaning is the process of achieving the clean condition, so human activities can take place in a healthy environment[4]. For cleaning to be effective, unwanted matter must become separated from the environment[5].

Thus, the removal of soil (e.g., organic dusts, cells, oils and proteinaceous substances) and its associated microbial growth (biofilm) from key high-contact surfaces and materials, remains the primary approach to achieving a healthy environment[6]. This cleaning process, through friction and dissolution, physically removes microbes and the associated matrices in which they may be embedded, such as saliva and/or nasal secretions from the nose or mouth, as generated by coughing or sneezing.

The manual cleaning process is crucial, as it removes substances that may block or interfere with the antimicrobial action of a disinfectant used to kill or otherwise inactivate any remaining microbial residues. Effective cleaning also utilizes those practices and procedures necessary for maximizing pollutant removal while containing the process and minimizing cross-contamination.

In all cases, cleaning must maintain the integrity of the surfaces/materials being treated, is heavily dependent on frequency of implementation and the efficiency of the cleaning equipment and products being used.

The Science Behind Microbial Spread

The importance of cleaning and environmental hygiene was emphasized in the results of a recent applied research study. The study investigated the spread of viral contamination via worker hands and key surfaces in an office building with 100 employees using 41 individual offices and 116 cubicles[7]. Using a virus surrogate (MS2 phage) inoculated to a few workers' hands and key surfaces, the spread of contamination was demonstrated, and an intervention using both surface disinfectant and hand sanitizer was found to significantly reduce viral concentrations on hands and fomites. It was also shown that the surfaces identified as most contaminated were the refrigerator, drawer handles and sink faucets in the break room, along with the push bar on the main exit of the building, and the soap dispensers in the women's restrooms.

If the process is carried out at an established frequency, then the clean condition becomes easier to achieve on a routine basis. Additionally, as an adjunct practice to cleaning, and an additional enhancement to cleaning effectiveness, the fogging or electrostatic spraying of an approved biocide may be utilized, with an understanding of its limitations[8].

Custodial Staff Training: The Key to Clean

The success of implementing a health-based cleaning program rests upon the implementation of its key practices by the custodial staff. Through education and training, custodial personnel must be able to:

- understand how infectious agents can be transmitted from contact surfaces to workplace occupants,
- identify surfaces considered as high-contact touch points associated with risk of disease transmission,
- implement effective cleaning and disinfection practices to include selection of appropriate methods, products, materials and personal protective equipment,
- conduct the targeted cleaning at a reasonable and economically feasible frequency, and
- assure that employees have accessibility to products that will assist in promoting the hygiene of individual workspaces, such as disinfectant wipes and hand sanitizer.

Protocol

Facility Hygiene

- For health and safety, cleaning staff should wear appropriate protective gear, which includes gloves, mask and eye protection, at a minimum.
- Following the closure of the building in the evening, all surfaces are to be cleaned and then disinfected with either a disinfectant wipe or a spray/aerosol disinfectant.
  - Spray cleaner can be applied directly to surfaces without electronics, left wet for at least one minute (if cleaner-disinfectant), then wiped clean. Disposable towels are recommended and can be folded and used again to complete the cleaning of the target surface before discarding.
  - For surfaces with electronics, such as computers, the spray cleaner-disinfectant is applied to a clean disposable towel, which is used to clean the surfaces.
  - Once surfaces are cleaned, they can be disinfected using disposable disinfectant wipes, one per surface, with folding once or twice as needed, followed by air drying. Larger surfaces such as counters may require several wipes. Spray or aerosol disinfectants may also be used.
  - Surfaces include all horizontal/vertical surfaces frequently touched, to include:
    - Entry door handles (both sides) and the frame surface above and below the handle for at least two feet and handrails.
    - Glass door surface adjacent to the entry handles and areas above and below the handle on both sides of the door and ADA push buttons.
    - Light switches, elevator buttons, mailboxes and remote controls.
    - Tabletops and soft materials of chairs and couches in waiting/reception areas.
    - Bathroom door handles, toilet seats, flusher handles, bathroom stall door handles and surfaces within two feet of handles, toilet paper and paper towel dispensers, sink handles, soap dispensers and countertops.
    - Shower control surfaces, shower walls and floors.
    - Door handles and surrounding door surfaces along with chairs, desktops, phones, keypads, drawer handles, keyboards, touch screens, computer mice, printers, pens, and other items in offices used by employees or customers.
    - Drinking fountain or watercooler, bottle-filler surfaces.
    - Kitchen or break room door handles, sink handles, soap dispensers, countertops, towel dispensers, appliance handles, tabletops and chairs. Frequently touched surfaces such as those listed above should also be wiped and disinfected on a regular basis during the day. Adherence to this daily schedule of cleaning and disinfection in facility environments will effectively work to suppress the microbial contamination on high-contact touch points or "hot spots," and greatly reduce the potential for contact transmission of pathogenic bacteria, fungi and viruses — including COVID-19.

PRACTICE 2: OCCUPANT HYGIENE

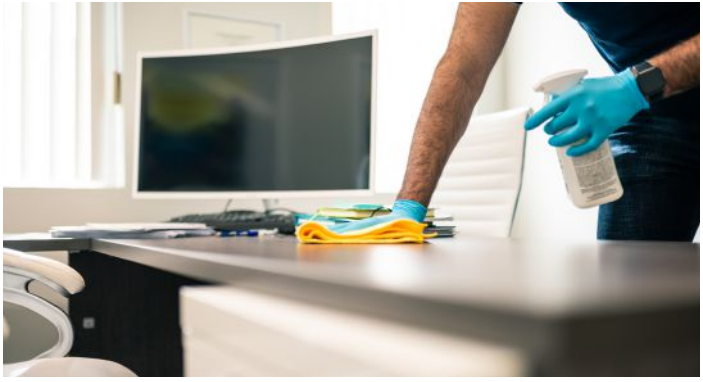
Maintaining effective hygiene in the workplace extends beyond the implementation of science-based cleaning and disinfection practices by custodial personnel. It also requires workplace occupants to understand and practice effective hand hygiene. A variety of published, applied research studies have described the primary high-contact touch points or "hot spots" that produce a microbial contamination network throughout a work environment. These not only facilitate infectious agent transmission in the workplace, but also often result in the transfer of disease-threatening contamination to surfaces and materials in the workers' home environments.

What the Science Says

Researchers artificially inoculated common-use surfaces in office environments with a copolymer resin tracer[9]. After touching contaminated surfaces, 86 percent of office workers from three separate offices transferred the resin tracer to their hands, while 82 percent transferred the resin to additional surfaces.

Following inoculation of a restroom faucet and exit doorknob, the resin spread most commonly to employees' hands, faces, phones and hair. From an inoculated communal phone, the resin spread most frequently to hands, face, hair, desktop surfaces, drinking cups, keyboards, pens and doorknobs. Resin was also found on a nearby drinking water fountain.

Finally, from an inoculated copy machine button, resin transferred to copied and original documents, computer equipment and employees' hands and faces. Five of the volunteers were accompanied to their homes for additional sampling, and 20 minutes after arriving home, resin was found on all subjects' hands, personal items (backpacks, purses, keys) and home surfaces (doorknobs, light switches, countertops and kitchen appliances). Thus, the combined phases of the study have emphasized the importance of cleaning and disinfection of common touch points, along with attention to hand hygiene, to reduce the risk of transmission of disease-causing infectious agents.



Hygiene Promotion

While encouraging employees to routinely undertake good hygiene practices may seem a daunting task, research has shown success in this effort. Implementation of a targeted risk reduction program, with surface disinfection of commonly touched shared objects and hand hygiene, including hand sanitizer at the desk and simple employee education (via intervention instructions, promotional signage and emails), resulted in a significant reduction of virus transmission in an office setting[7].

Protocol

Workspace Hygiene

- Cleaning products and disinfectant wipes should be made available for use by employees on a regular basis during the workday.
- Employees should be encouraged to maintain a clean and safe work area by periodically cleaning their workspace, especially daily during cold and flu season, an outbreak situation or pandemic.
  - Cleaning should focus on the most common general usage touch points, for both clients and staff, such as doorknobs, handles, counters, desk-tops, armrests, computer keyboards and telephones.
- Employees should be aware of the need for handwashing and have access to hand sanitizer (with minimum 62 percent ethanol) at key locations, to include workspace, break rooms, copy centers, elevators, vending are as and restrooms.

A Paired Hygiene Approach

The need for cleaning and disinfection is an essential step in stopping the chain of infection. While the need for hand sanitization is well understood, it is only effective when paired with the cleaning and disinfection of surfaces. Together, the combination maximizes the reduction of risk for pathogen transmission, since both the potential for depositing pathogens onto surfaces, as well as removing them from surfaces via attachment to fingers and hands, are greatly reduced. This was emphasized in a recent study showing that "a combination of hand hygiene and surface cleaning is more effective than any single intervention," and that "hand hygiene alone is insufficient as a control measure for the fomite transmission of pathogens and must be paired with surface cleaning."[10]

Peer-reviewed, published, scientific research studies have confirmed the need for and importance of the combined interventions of health-based cleaning by the FM custodial staff, along with effective personal hand and workspace hygiene by the workplace occupants, to reduce the risk of transmission of disease-causing infectious agents in the work environment. FMJ

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Don’t Break the Supply Chain

5 risk management questions FMs should ask

BY JEFF MUTO

Most company leaders understand that their organizations are responsible for maintaining safe and healthy conditions in their workplaces while ensuring their workforce adheres to safe practices in the performance of their work both on and off the jobsite. But it bears reminding that this responsibility spans the length of a company's supply chain, including third-party contractors and vendors.

Managing risk across the entire operation is new territory for many firms. In 2019, half of respondents to a survey of supply chain organizations indicated that they lacked an efficient means of assessing the safety record and compliance histories of firms under consideration for hiring as contractors or subcontractors. This common and avoidable blind spot in vendor selection exposes firms to a host of risks that can lead to injuries, productivity loss, or damage to property, the company's reputation and its bottom line.

The world has grown more conscious of safety risks and liabilities. COVID-19 has caused companies reconsider their approaches to occupational safety and health, and to adopt new measures to protect their workers and communities. There is a growing need to ensure third parties comply with the larger organization's health and safety rules and standards, and a realization that regulators will hold the company accountable for risk management contractors and subcontractors as well as direct employees.

Managers attempting to update their company's risk mitigation programs to reflect constantly evolving regulations may feel overwhelmed, particularly when dealing with remote projects and complex or global supply chains. This has been further complicated by supply chain disruptions due to government-mandated lockdowns, temporary and permanent business closures, tariffs, and trade restrictions. At a time when risk is high and assessment is critical, supply chain managers are expected to increase flexibility to maintain the flow of goods and services by rapidly replacing sidelined vendors and suppliers.

Now more than ever, businesses need an efficient solution to mitigate supply chain risk to address three key pain points:

- A solution must enable them to be thorough and systematic in evaluating the safety qualifications of potential contractors and subcontractors before they are hired (a vendor safety prequalification program).
- It must ensure the entire workforce, at all locations, is up to date on required insurance, training and certifications needed.
- It must allow flexibility to adjust with changing conditions and the organization's growth.

To optimize their management of risk throughout the supply chain, business leaders should ask five questions to maximize the effectiveness of the solution. These answers will vary by company, industry, and geography, and will help define the requirements and capabilities the organization needs in either an outsourced platform or one developed inhouse.

1 How are we ensuring the safety of our workers, operations and supply chain?

The starting point to establish or improve any occupational safety and health program is an assessment of current standards and practices. What government and industry regulations govern the business? What are the safety measures required for each activity and at each location? Be sure to include unique circumstances that may relate to service lines, production facilities or other locations and processes. It may take some time to fully answer this first question. The complexity of today's global supply chains has increased with pandemic concerns, which has spurred industries and communities to integrate new safeguards and protocols into existing risk management practices. New standards communicated from public health authorities, industry associations and other sources may have been adopted within the organization but could be at scattered locations or in siloed business units. Now is the time to bring together and organize all these piecemeal risk mitigation activities into a centralized, coordinated risk management program. When brought together and updated, these safety measures will form a comprehensive body of information that will guide risk management from leadership down to the worker level. Team members will be able to rely on this single resource as the company's definitive guide on every safety requirement. The right technology can help manage and organize this information and put it at a worker's fingertips, with everything from technical specifications for the placement of physical barriers around workstations to the latest guidance on how to sanitize surfaces and equipment.

2 How do we remain compliant with current regulations?

The comprehensive risk management library or database developed in response to the previous question will be a valuable asset, but will require regular updates to remain current. Rules and regulations evolve in response to a myriad of factors, including (yet hardly limited to) globalization, legislation, and new information related to health concerns. It is important for organizations to systematically monitor official channels (such as the Occupational Safety & Health Administration (OSHA) in the U.S.) for the latest guidance on protocols, training procedures, and processes required to ensure safe, compliant worksites. While some organizations rely on designated personnel to track and alert the company of regulatory changes, a supply chain risk management platform can provide automatic monitoring and alert the management or safety team when changes require adjustments to their existing programs or practices. Similarly, the solution can establish how the company monitors or receives updates from state and local health authorities, and how it incorporates those channels into the platform.

3 Have our contractors and vendors updated health and safety requirements in the wake of COVID-19?

This is a reminder that compliance requires not just adherence by direct employees but also those third-party firms and contract workers in the supply chain. Because many of the rules and regulations in place today are new, it is advisable to ask contractors about recent adjustments to their practices, insurance and other safety provisions and confirm that they qualify and meet internal requirements and expectations. In any year, new health risks may force companies to revisit processes and procedures, adjust insurance coverage, restructure supply chains, and essentially rethink the way they do business. A risk mitigation program should include mechanisms to keep the organization's rules and regulations up to date, and continuously monitor for needed adjustments, including refresher training.

4 How will our program boost overall efficiency and smooth operations?

In one sense, every accident, illness, or property loss averted through adherence to workplace rules is a risk-mitigation success. The high costs that can be a result of failing to comply with health and safety rules include injury, illness, or death, fines or court judgements, and damage to a company's reputation and business relationships. Risk and contractor management technology can reduce the opportunity for human error and automate key components of the program, such as organizing training schedules, monitoring insurance coverage and notifying managers of rule changes. The right solution will help to address multilevel risks and simplify the administrative burden while giving employees and third parties the systematic support they need to improve compliance across the entirety of the organization. Look for additional features that can boost efficiency or enhance safeguards. Vendor prequalification tools, for example, can offer the assurance that a firm under consideration for hiring is up to date on its insurance and training. Over time, the same software can capture vendor safety data for analysis and ongoing improvement.

5 Will our program cover us as we expand into new geographies and industries?

Global supply chains are realigning. Companies are adjusting to new challenges, with many expanding their operations to retain competitive advantages and seize new opportunities. As an organization extends its footprint to new markets or crosses into other industries, its leaders must consider whether their risk management capabilities can grow with them.

The right risk management platform should be able to evolve and scale for growth, serving as an important partner. Some management platforms are backed by global networks of organizations and contractors, offering their services in multiple languages to help companies manage supply chain risks while expanding operations around the world.

Today's dynamic supply chains call for robust risk management programs with the capacity to keep policies and procedures in sync with evolving regulations. They must coordinate and track training, insurance compliance and certifications for all positions including contract workers and vendors, and at multiple locations. Providers may combine risk-management software with services, such as training, expert advice, and analytics to further enhance their strategies.

Without the aid of a comprehensive plan or technology platform that is up to the task, risk management in a supply chain can quickly become overwhelming. But before investing in a new platform, companies should research their options and find the solution or provider best suited to their needs. The time and effort it takes to establish and optimize a risk management platform is an investment that will pay off in the form of a safer workplace for everyone, from employees to third-party contractors and vendors. FMJ

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LEGIONNAIRES'

DISEASE:

COVID-19 for Buildings?

BY SCOTT L. WEILAND

In July 1976, the Pennsylvania chapter of the American Legion held its annual state convention at a Philadelphia hotel. About 4,000 members attended. In the days that followed the convention, 221 of the attendees became ill and 34 died from a mystery form of pneumonia. The U.S. Centers for Disease Control (CDC) immediately investigated the disease, initially looking at viral causes. By January 1977, they had identified and isolated a bacterial source for the respiratory issues, and later named it Legionella pneumophila. These Legionella bacteria were breeding in the cooling tower of the hotel's air conditioning system. The air circulated by the system contained small droplets of water that held the bacteria, infecting guests as they breathed in the air at the hotel.

Once the cause of the Philadelphia outbreak was determined, CDC investigators uncovered instances of the disease dating back to 1959. One of the significant outbreaks discovered was at a psychiatric hospital in Washington, D.C. In 1965, 81 people associated with the hospital contracted pneumonia and 14 patients died. The infection was traced to water in a lawn sprinkler system. Specimens of the water were saved and, once Legionnaires' disease was identified in 1977, the specimens were re-examined and matched the strain that infected the Legionnaires in Philadelphia in 1976.

The occurrence of this bacteria is not limited to the U.S. The single largest outbreak of Legionnaires' disease happened in Murcia, Spain. Between July 7-22, 2001, more than 800 suspected cases were reported, 449 of which were confirmed. The outbreak was linked to the cooling towers at a city hospital.

In 2003-2004, bacteria in a petrochemical plant's cooling tower resulted in 86 cases of Legionnaires' disease throughout the community of Pas-de-Calais, France. Various reports state that 18-21 of those who were infected died from the disease, the worst outbreak of Legionnaires' in French history. After this incident, scientists learned that the airborne bacteria can spread much farther than originally suspected. The outbreak happened in two phases: the first wave of illness happened after the cooling tower was shut down, and the second happened during the cleaning of the contaminated tower after it reopened. It is believed that the cleaning methods used to decontaminate the tower, using high-pressure cleaning equipment, may have contributed to the second spread of the disease.

Fast forward to the summer of 2019, when guests staying at an Atlanta hotel (Georgia, USA) became ill with Legionnaires' disease. Thirteen people, including one who died, were diagnosed with the disease and more than 60 "probable cases" were reported, the largest Legionnaires' disease outbreak ever in the state. Health authorities found Legionella bacteria in the hotel cooling tower, as well as in a decorative fountain in the hotel's atrium. The hotel closed voluntarily to remove the bacteria and undergo inspections to ensure there were no Legionella risks at the hotel, reopening about a month later.

Since 2000, the number of reported cases of Legionnaire's disease in the United States has jumped from about 1,000 to nearly 10,000 in 2018. The reported number could be well below the actual number, as the disease may be underdiagnosed. Special testing is required to determine whether a person has Legionnaire's disease, as opposed to other strains of bacterial pneumonia, and those tests are not always conducted or available in some countries. Some researchers estimate as many as 70,000 or even 100,000 people in the U.S. get the disease each year.

Similar to Legionnaires' disease, but not as severe, Pontiac fever is a flu-like illness that is also associated with Legionella bacteria. In 1968, workers at the county health department in Pontiac, Michigan, USA, exhibited flu symptoms, but not pneumonia. After the discovery of Legionnaires' disease, blood samples from the workers were re-examined and it was determined that their illness had been caused by the same bacteria. Victims of Pontiac fever typically recover within three days with no treatment. Because it resolves itself, Pontiac fever is never reported or goes undiagnosed, so it is more widespread than records show.

Today, in light of building closures and slowdowns during COVID-19, the risk of Legionnaire's disease and Pontiac fever rises. When buildings sit idle, the plumbing and HVAC systems are typically turned off to save money. This results in warm, stagnant water sitting in the systems, creating a breeding ground for bacteria. When workers come back and the systems are turned on, the bacteria can be distributed throughout the building. Even some of the buildings leased by the CDC were found to contain Legionella bacteria in their water sources after being closed for several months during the pandemic. Those buildings are undergoing remediation to ensure the bacteria is removed before workers return.

What is Legionnaires' disease?

Legionnaires' disease is a type of pneumonia, or lung infection, with symptoms that include cough, shortness of breath, muscle aches, headaches and fever. Most healthy people are not affected by the bacteria, but those who are more than 50 years old, current and former smokers, people with weakened immune systems and those with chronic disease are at higher risk. Most people recover when hospitalized and treated with antibiotics, but about 10 percent of those who get the disease die from it.

What are Legionella bacteria and how does it spread?

Legionella pneumophila is the bacteria that causes Legionnaires' disease. It grows naturally in freshwater environments, but can be found in other common water sources, including cooling towers, showerheads and sink faucets, decorative fountains and water features, hot water tanks and heaters, and large plumbing systems. The cooling towers are part of industrialized air-cooling systems that are used as cost-effective HVAC systems in commercial buildings, including large office buildings, schools, hotels, hospitals and cruise ships. Cooling towers are also used to cool water that is used in the manufacturing processes of power plants, petroleum refineries, food processing plants and other facilities. Even home humidifiers can become a breeding ground for Legionella bacteria.

The vast majority of cases of Legionnaire's disease are contracted by breathing air that is contaminated with the bacteria. When water is used in the HVAC or cooling system, the air circulating in the building contains small droplets of water. If the water contains Legionella bacteria, it is inhaled in normal breathing. It is possible, but unlikely, to contract Legionnaires' disease by accidentally getting water in the lungs while drinking water contaminated with Legionella pneumophila — this occurrence is very rare.

Relative humidity (RH) can help or hurt the transmission of Legionnaire's disease. In areas with 40-60 percent RH, the air's hydration slows the travel and minimizes the reach of bacteria, which thrives on moisture. When the air carrying the bacteria is dry, the bacteria dies. When humidity levels rise above 60 percent, the bacteria's survival rate improves, thereby increasing the risk of infection. The higher relative humidity generally experienced in summer months can lead to summertime outbreaks.

How does Legionnaires' disease compare to today's COVID-19 coronavirus?

Both Legionnaires' disease and COVID-19 affect the respiratory system and have the same symptoms, noted above. The primary difference in the two illnesses is that COVID-19 is viral and Legionnaires' is bacterial. COVID-19 is highly contagious and is most

frequently spread through coughing or sneezing. Legionnaires' disease is only contracted by breathing or aspirating the Legionella pneumophila bacteria, as detailed. Legionnaires' disease is not contagious, although it is possible in rare cases.

What can be done to prevent Legionnaires' disease outbreaks?

The key to stopping Legionnaire's disease is proper disinfection and maintenance of the water systems, HVAC systems and humidification systems where Legionella pneumophilia bacteria thrive. Buildings that have been closed, in particular, should focus on disinfection and maintenance before workers and customers reenter. Some regions have government regulations to help reduce the occurrence of legionella bacteria. In the U.K., the government's Health and Safety Executive (HSE) suggests using a dipslide for weekly microbiological monitoring of wet cooling systems and recommends testing systems at least quarterly — more frequently if the system has already had an incidence of legionella bacteria or if it is a newly commissioned system. In Malta, new cooling towers and evaporative condensers have been prohibited in health care facilities and schools, to limit the potential for bacterial issues, and the country requires cooling towers and water fountains be tested twice each year for Legionella bacteria.

One of the keys to preventing the growth of Legionella pneumophila bacteria in building systems is limiting the growth of the bacteria in potable water. Ensure that hot water tanks are properly sized. To minimize Legionella, water held in tanks should be maintained at the proper temperatures: at or below 20 degrees C (68 degrees F) and at or above 60 degrees C (140 degrees F). Inspect plumbing systems for places where water can stagnate, such as dead legs. Places that harbor stagnant water should be corrected to help minimize the growth of bacteria. Water in building systems must also be monitored and continually treated to maintain the concentrations of free residual chlorine that minimizes bacteria growth. Usually 1-2 milligrams per liter at the tap will provide the proper level, but each system's manufacturer's recommendations should be followed.

Make a point to limit growth of Legionella pneumophila bacteria in water-cooled and heat-transfer systems. Systems should be disinfected, then maintained and operated, including treating with the appropriate biocides, in accordance with the manufacturer's recommendations. Look at the placement of cooling towers, ensuring that they are away from public, building make-up air. Installing drift eliminators on cooling towers can help reduce fugitive water droplets that may host bacteria.

Being mindful of the places where bacteria is likely to grow in building systems is the first start to preventing outbreaks. Check with governmental agencies who have jurisdiction over the area to ensure compliance with mandatory service and inspection guidelines and consult with the manufacturer for specific system information. Industrial trade organizations are often a good resource for guidance in avoiding the spread of Legionella pneumophilia. There are specialized companies dedicated to water system management that focus solely on Legionella pneumophila, who can be contracted for ongoing control services.

As businesses continue to open after being shut down or having their operations slowed by COVID, the risk of Legionella pneumophila affecting facilities is higher. Properly inspecting, disinfecting and managing building systems can minimize the occurrence of this dangerous bacteria and reduce the risk of Legionnaire's disease, Pontiac fever and other illnesses that can result from these harmful water-borne bacteria. FMJ

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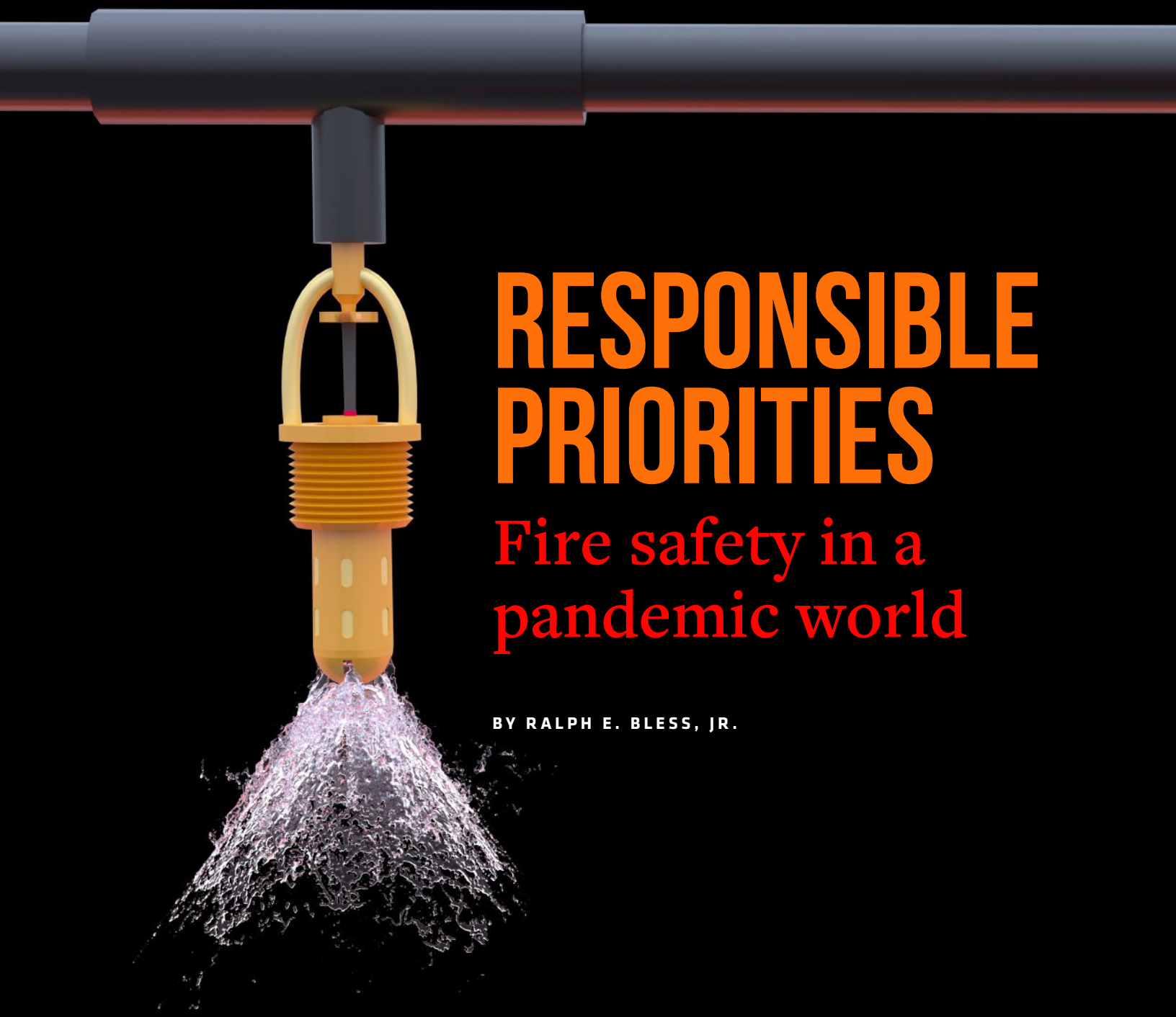
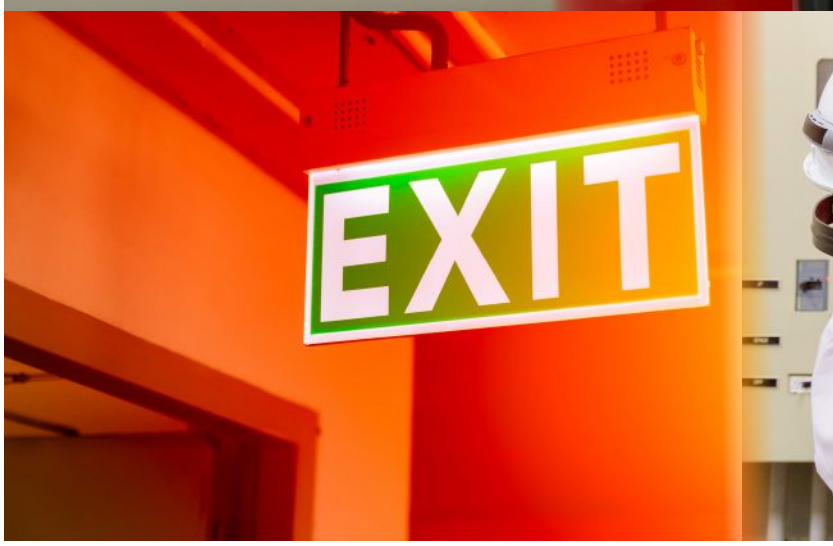


RESPONSIBLE PRIORITIES

Fire safety in a pandemic world

BY RALPH E. BLESS, JR.



The last year has been a trial that most have never experienced. Even those who are old enough to recall significant world events recognize this pandemic as extraordinary. Not since perhaps World War II have people experienced an event that has simultaneously impacted the world's population.

While individual countries have had events that have impacted their citizens, the COVID-19 pandemic is unique. Family, community and country tragedy in the form of loss of life, stress and interruptions of daily life have made it a struggle. Multiple shutdowns, the inconsistency of implementation and clarity of proper protocols early in the pandemic have created confusion in certain societies.

Out of all of this, businesses have been and are continuing to be challenged to respond safely, restrict, restructure, partially or fully close, as well as reopen to the public. This is compounded because this is not a one-time occurrence as seen with other disasters. With floods, earthquakes and similar calamities, those who are subject to these events typically can anticipate a relatively linear process through a cycle of awareness, preparation, event, aftermath and recovery. In these types of natural disasters, the events are usually limited to a local or regional area, so there is outside assistance available.

Unfortunately, with COVID-19, the entire world has struggled. There have been conflicting views on how to address and accommodate, which confuses the public, as well as business owners and facility managers. Because COVID-19 has not been a linear process, but rather a recurring set of events, it is a challenge to learn and adapt while meeting the needs of businesses, employees and communities.

For FMs, part of this process requires consideration of the responsibility to fire safety. This is especially critical during the pandemic as health care workers, firefighters and other emergency responders are already stressed. In many cases, communities are exceeding the capacity of their emergency response networks, leaving it upon everyone else to limit the issues that might require emergency responder attention.

INSPECTIONS, TESTING, MAINTENANCE AND REPAIR

In the early days of the pandemic, it was common to be approached by multiple stakeholder groups, including business owners, FMs, authorities having jurisdiction (AHJs) and fire safety service vendors asking for relief from the normally scheduled inspections. FMs reported being overwhelmed, concerned about exposure from technicians, preservation of capital, maintaining their employees and businesses, as well as long-term liability. AHJ employees were stressed as they operated in multiple areas, supporting their communities as emergency responders and

health care advocates. Fire safety service providers' issues reflected the larger FM concerns with the added influence of knowing they are an integral part of the life safety measures in the communities they serve.

Questions about stopping or delaying inspections, testing, maintenance and repair activities were, and still are, common. The National Fire Protection Association (NFPA) provided guidance on keeping buildings safe for occupants and the community, so that they might be able to continue to serve.

Some areas to consider prior to modifying any inspection, testing maintenance and repair schedule (ITMS) should include:

- **Life safety and egress** is, in many cases, dependent on the fire protection systems (extinguishing, notification, containment, etc.) operating properly. By reducing or eliminating ITMS activities, the risk of these systems not operating properly in an event increases.
- Emergency responders rely on **fire suppression and safety systems** to protect occupants until they can arrive and begin operations so that the fire does not grow, requiring more resources than anticipated or available.
- **Unoccupied or reduced occupancy facilities** are at additional risk due to lack of people identifying issues early on. This can include leaking pipes, fire alarm systems in supervisory/trouble conditions, missing or used fire extinguishers, obstructions to egress and other issues.
- **How long is too long?** For many, the pandemic has stretched on longer than anticipated. So, if someone is considering delaying ITMS activities, the natural question is: for how long?

There is not a one-size-fits-all answer to these questions. Each facility is unique in the community it serves and the types of systems that are installed to protect. For example, it is common to have two buildings that appear from the outside to be very similar, but due to time of construction or other factors, one may have a fire sprinkler system and fire alarm system, while the second building only has a fire sprinkler system. If all other factors are the same, the second building may need additional attention to the fire sprinkler system, because it is the only system protecting the building and occupants.

For these and many more reasons, most jurisdictions have deemed fire safety service technicians as essential workers, recognizing the important functions they provide in keeping their communities safe.

BUILDING REOPENING

Fire safety challenges for businesses extend well beyond ITMS activities. If a facility has shut down due to the pandemic, there are considerations that should be factored into reopening a fire-safe facility.

Any delayed ITMS activities should be completed prior to opening. Additionally, FMs should ensure:

- Fire sprinkler systems and fire pump systems (NFPA 25) are active and in good working order.
- Fire alarm systems (NFPA 72) are active and free of trouble, supervisory or alarm conditions.
- Fire extinguishers (NFPA 10) are present and in good condition.
- Fire doors, emergency lighting and exit signs (NFPA 80 and NFPA 101) are functional and in good condition.
- At a minimum, a monthly level inspection identified in the various NFPA Standards should be completed.

Means of egress are critical to fire safety and other emergency incidents. Prior to reopening, it is important to validate appropriate egress is available. Consideration should be given to all three components of the means of egress: the exit access, the exit and the exit discharge. The distance to exits and the path of travel through the facility must be unencumbered. Ensuring clear guidance with fire exit maps, exit signage and lighting is an important part of keeping people safe. Verifying that the paths to all fire exits are clear of storage or other obstructions and doors are not blocked or locked is critical. FMs should conduct fire exit door tests to validate that the doors will properly and fully open. It is possible that doors that have not been operated in a while may be difficult to open, or that landscaping or hardscaping (sidewalks, pavers, etc.) will impede door operation.

Additionally, if ingress or egress paths and patterns have been modified to provide for more social distancing, it is imperative to confirm sufficient egress. Some FMs may even want to keep doors open to limit contact with surfaces and reduce the spread of COVID-19. While that is an appropriate goal, it is also essential to ensure that fire doors are not prevented from closing automatically in the event of an incident.

Fire drills should not be overlooked. In the past, occupants may have had regular drills that acclimated them to the expectations and process of an evacuation during an incident. However, due to extended periods of time away from the building, additional issues distracting occupants, and occupants who may be unfamiliar with the facility, holding a fire drill near or upon the time of reopening is appropriate to maintain occupant safety.

CHANGES IN USE

With the challenges of pandemic response, businesses are becoming more creative in the use of their available space. It is incumbent on the business to have a qualified review of the change in use and to work with the jurisdictional authorities for approval. Consideration of the egress, suppression, notification and other fire safety features and systems must be considered.

One opportunity that may be overlooked is the change in the types of products a business is storing in its storage areas. Even if the area was always used for storage, introducing more hazardous products into the area may prompt a need to reevaluate the protection provided. A common example of this has been the introduction of significantly larger volumes of hand sanitizer. Many of these products are classified as flammable or combustible liquids, creating unique hazards that must be properly mitigated.

There are so many issues and subjects for FMs to consider related to the adjustments necessary to continue to operate. It is understandable why fire safety subjects may not receive the attention they need. However, it is imperative businesses realize their importance and work together to keep communities safe and productive. Businesses are vital to the character and vitality of the community, and so they have a significant responsibility to the community to remain viable and safe during these times.

With careful thought and some planning, businesses can operate while mitigating these risks. FMJ

NFPA FACT SHEETS CAN BE FOUND AT: NFPA.ORG/CODES-AND-STANDARDS/RESOURCES/STANDARDS-IN-ACTION/NFPA-RESPONDS-TO-THE-CORONAVIRUS/CORONAVIRUS-BUILDING-AND-LIFE-SAFETY

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A New Standard

INSTILLING A SENSE OF SAFETY DURING REENTRY

BY RACHEL OLSAVICKY

Unprecedented situations call for unprecedented measures, which is why today's built environment requires a new standard of hygiene. Since the spring of 2020, communities have struggled with significant shifts in everyday life. Many have gone from quarantine and various stages of lockdown, to multiple phases of reopening or return-to-work protocols. Some workers have not been inside their offices in a year. However, frontline workers have continued to go to the physical workplace every day during the COVID-19 pandemic.

A return to public life is coming into focus, and as people start to reenter buildings, expectations for elevated hygiene in public places and the workplace have sky-rocketed.

While millions of employees continued to work throughout the most devastating public health crisis in over a century, businesses, building management companies and facility managers are under increased pressure to provide occupants with assurance that spaces are safe and hygienic.

As society navigates the uncertainties of this new working landscape, FMs must ensure they have the necessary resources in place to manage the risk of infection. By maintaining high standards of cleanliness, they can help instill a sense of safety as people begin to return to work — and continue to support those who have been walking through their doors every day since the COVID-19 crisis began.

Setting the new standard of hygiene

Globally, many areas are still grappling with quarantine restrictions, but for those on their way back to work — or those who have never left — very real concerns remain about infection that FMs can help alleviate by implementing hygiene standards that can have a demonstrable impact on reducing the spread of transmission.

Due to the contagiousness of COVID-19, highly regimented cleaning and behavioral protocols must be implemented to contain a pathogen that is easily spread through human contact, can live on surfaces for prolonged periods and is airborne. This means increasing the frequency of cleaning, greater monitoring of high-traffic areas — such as common spaces and restrooms — and ensuring that frontline cleaning staff have the tools and support they need to sufficiently stay on top of enhanced schedules and new, rigorous protocols.

It is also vital that handwashing stations are readily accessible and that they are regularly maintained. Approximately 70 percent of offices today have open-seating plans[1], which can contribute to the spread of the virus that causes COVID-19 due to shared surfaces. It is more important than ever that frequent handwashing and equipment disinfecting practices are encouraged and actively promoted. There are numerous free materials and resources available from governmental health services, such as the Centers for Disease Control (CDC) and industry leaders including distancing guides, posters for high-traffic areas, floor decals and much more.

Prevention is the key to success. Having a hygiene strategy that provides people with the knowledge they need to navigate and uphold these new standards is critical to assuring workers that they have a safe place to work.

Developing a new hygiene strategy

COVID-19 is reshaping behaviors and attitudes toward public spaces and increasing awareness of hygiene that has dramatically changed how people interact with the world. Social distancing and wearing masks have become the norm, while handwashing has become an important aspect of everyday life, having a targeted approach to cleaning operations and enforcing proper hand hygiene can greatly improve efficiency and efficacy.

Common areas and restrooms require the most maintenance because they experience the highest traffic flow. Fortunately, with consistent surface cleaning and proper hand hygiene, it is possible to help mitigate the spread of germs in an office building.

Having disposable wipes available, increasing the frequency of in-depth cleaning, and making sure staff has an ample supply of hygiene tools and cleaning equipment is a great start, but there is more that can be done, which starts with having a strategy.

- **RESTROOMS:** In restrooms, cleaning should begin with the cleaner areas first, and finish with the dirtiest, such as toilets and the floor. Sponges and mop buckets can harbor bacteria and microorganisms, so consider using disposable wipes as an alternative. Installing high-capacity hand towel dispensers that release one sheet at a time will reduce the risk of runouts and prevent hand towels from being touched by anyone but the user. Restroom cleaning checklists can help staff think ahead and serve as a reliable way to check off tasks as they are completed. Ensuring handwashing signage is prominently displayed above sinks and reminding employees to wash their hands thoroughly for at least 20 seconds can also help promote proper handwashing habits.
- **BREAK ROOMS:** Office break rooms can contribute to the spread of disease and should be addressed with a calculated approach. Similar to restrooms, start with the cleanest areas and move toward the most heavily soiled. Considering they often house cooking appliances, grease and oil residue is generally prevalent, which should be treated with hot water and professional detergents. Once cleaned, it will be much easier to sanitize the area. Hand sanitizers should be accessible so employees can clean their hands after touching common surfaces, as well as napkins and paper towels to clean up any spills. To support healthy habits, consider posting signage to encourage social distancing and proper hand hygiene when employees are away from their desks.
- **OPEN SPACES:** In open concept offices, people share facilities and technology, and thereby face more hygiene risks. With large numbers of people in one place, there are myriad surfaces that can transmit contagions and host bacteria. Keyboards, computer mice, printers, telephones, conference rooms and tables, and other frequently touched items must be thoroughly cleaned and sanitized regularly. There should be signs informing office workers that areas have been sanitized, as well as posters to encourage social distancing and emphasize safe working practices. Keeping working spaces at least six feet apart and adding plexiglass between desks can offer an extra layer of protection for employees.

Having strategically placed hygiene stands for hand sanitizing and disposable wipes openly accessible are simple ways to help office workers keep their equipment disinfected, giving them a little peace of mind, while also serving as a visual cue to remind people to take hygiene in their own hands.

Optimal dispenser placement within the workplace could include:

- **RECEPTION:** Keep one-at-a-time napkin dispensers near seating areas and hand sanitizer, facial tissue and waste bins accessible at the reception desk.
- **RESTROOMS:** Maintain toilet paper and seat covers in stalls; place facial tissue, soap, touch-free paper towel dispensers and sanitizer on adjacent walls with a waste bin at the exit.
- **BREAKROOMS AND KITCHENS:** Have soap, hand towels and disposable wiping cloths next to the sink — with a waste bin underneath or next to it — and sanitizer and one-at-a-time dispensers on common tables.
- **CONFERENCE ROOMS:** Place sanitizer, disposable wipes and waste bins along the entrance wall, and one-at-a-time napkin dispensers and facial wipes on conference tables.
- **DESK AREAS:** Have sanitizing stations and one-at-a-time dispensers placed in high-traffic areas, and facial tissue, disposable wipes and waste bins at desks.

The easier it is to access sanitizing and disinfecting products, the easier it is to keep the area clean.

Operational adjustments

In addition to robust cleaning and disinfecting, larger operational changes can play a major role in managing the risk of infection by reducing the number of interactions during the workday.

Starting with the morning commute, adjusting working hours and staggering arrival and departure times can greatly reduce congestion in lobbies, elevators and common areas — not to mention avoiding overcrowding on public transportation for those who rely on it.

For workers who are able, and businesses that have the capability, allowing for remote working is a surefire way to minimize physical interactions. If remote working is not possible, staggering schedules to keep half the workforce on site on any given day would be advisable.

Inevitably, many workers will have to head back to the office or workplace, which will require organizations to rethink workstation orientations to ensure workers are adequately distanced and have proper safeguards in place — such as plexiglass barriers — to further reduce contamination. In-person meetings should be limited, but when they are unavoidable, people should practice social distancing and proper hygiene.

Utilizing digital cleaning solutions

In this constantly evolving environment, it is difficult for FMs to stay on top of all that needs to be accomplished and reported on. To ensure cleaning protocols are properly executed and hygiene products are readily available, FMs should consider investing in digital cleaning solutions. Digital cleaning solutions enable businesses to eliminate redundancies and increase productivity without increasing the workload. This type of cleaning, known as data-driven cleaning, can reduce the number of cleaning hours by at least 20 percent[2], improving efficiency and user satisfaction.

By enabling cleaners to act on real-time data that allows them to understand what needs to be cleaned and when, cleaners can improve the quality of their cleaning operations and eliminate unnecessary work, freeing up their time to focus on other critical tasks.

With data-driven cleaning, FMs can not only optimize their operations and secure a new standard of hygiene that creates safer spaces, but also create a whole new level of productivity, staff engagement and customer satisfaction.

Helping people feel safer

As concerns around hygiene remain heightened, and public places are viewed with concern, businesses and FMs are earning the trust of their employees and tenants. Providing hygienic workplaces is essential to helping people feel confident about getting back to work,and securing a new standard of hygiene is designed to do just that.

Meeting the needs of a shifting economic landscape has been a monumental challenge, but communities are adapting. With the right tools and well-defined strategies, it is possible to give people the confidence that hygiene standards will continue to be met, and that their workplaces are determined to help them safely adjust to new ways of working. FMJ

1. 2010 survey of 424 office-space managers by the International Facility Management Association
2. Numbers based on the documented results achieved by three Tork EasyCube customers, measured before and after the implementation of Tork EasyCube.

Rachel Olsavicky *is the regional marketing manager, commercial and public interest for Tork, an Essity brand, which develops, produces and sells professional hygiene products and restroom solutions. As regional marketing manager, she oversees end-customer marketing plans in offices, schools, airports, and other commercial and public interest segments.*

CONSTANT CONTACT

COMMUNICATIONS TECH'S ROLE IN LONG-TERM BUSINESS CONTINUITY

BY **TOMER MANN**

IN 2020, A WHIRLWIND OF UNCERTAINTY SWEPT THE GLOBE AS BUSINESSES MET A CHALLENGE THAT WAS PREVIOUSLY UNACCOUNTED FOR IN THEIR STRATEGIC PLANS: A PANDEMIC. FROM PIVOTING TO A REMOTE WORK MODEL TO FINDING NEW WAYS TO MEET SAFELY, TWO QUESTIONS HAVE LOOMED OVER THE FACILITY MANAGEMENT INDUSTRY SINCE THE START: HOW (AND WHEN) WILL THE WORLD GET BACK TO NORMAL? AND WHAT CHANGES ARE NEEDED TO ENSURE A SMOOTH TRANSITION BACK?

In the last year, many organizations opted to keep employees working remotely, wherever possible. Now, with a viable vaccine rolling out and eyes are ahead to a still uncertain future, FM teams are tasked with preparing buildings for capacities more closely resembling pre-pandemic, while remaining flexible and agile in their preparations for whatever comes next. These facility reopening plans must include strategies that best serve a population that is equally apprehensive and excited about the possibility of returning to them.

Communications technology can support FMs in creating more effective, accessible and data-rich environments across numerous industries. This technology can take the form of all-in-one software platforms, physical digital displays for wayfinding with built-in communications functionality, thermal screening kiosks and more.

DIGITAL SIGNAGE FOR WAYFINDING & TRAFFIC CONTROL

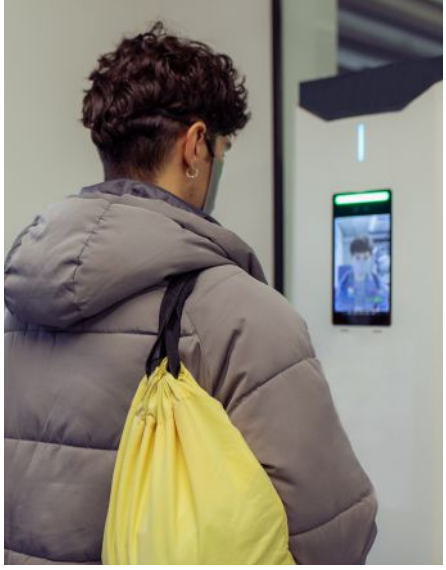
Wayfinding and signage in buildings has long been an important consideration for FMs. They maintain traffic flow, provide key information points and relieve receptionists or other front-line workers in a building.

Interactivity is one of the key benefits that digital signage and wayfinding brings over traditional building directories or static signs. Effective modern wayfinding is more than just showing a visitor where they need to go in a building — it provides suggested routes, such as one-way traffic flow, syncs with real-time data to show occupancy and can be updated by FM and IT teams with little technical savvy needed.

Post-COVID-19, the way in which this interactivity occurs is even more critical. Providing visitors with ways to safely access information, push updates to hundreds of displays and show building occupancy is important to ensure safety protocols are met. In the past, groups of people clustered together around maps at an airport, for example, to determine gate locations, find food and shopping, or entrances and exits. Now, social distancing requirements challenge this old way of accessing information. Touchless access and control reduce physical touchpoints, control crowds and support social distancing whether it is through voice commands, gestures or mobile QR code scanning. A visitor can simply walk up to a digital sign, point their mobile phone at a QR code, and instantly be connected to the same map with wayfinding functionality from their own personal device. This functionality is not limited to malls or transportation hubs – practically any building can benefit from implementing signage that can be accessed via QR codes. For buildings that already had digital signage, this functionality can usually be added to existing signage easily.

THERMAL SCANNING & TEMPERATURE CHECKS

One important tool for facilities that exploded in popularity after the onset of COVID-19 is thermal scanners. Temperature checkpoints became mandatory in buildings as an added layer of protection against viral spread. At an entry, providing a temperature screening before a building visitor has entered traffic-heavy parts of the venue can significantly reduce the risk



to other visitors and help notify staff when there is risk of viral spread in the facility. Many of these thermal scanners are built into full kiosks or displays. Another popular feature often grouped alongside thermal scanning in these displays is instant video calling to connect a receptionist or other employee to voice chat with an individual remotely to provide next steps and instructions after the scan has been completed. This ensures that the screening and check-in process is seamless, as well as safe, by eliminating the need for face-to-face interaction.

Depending on the venue's need, the check-in kiosks can be customized with an abundance of features: touch-free navigation, facial and mask recognition, multi-user recognition, informative displays for communicating guidelines or accessibility to maps for one-way navigation. To reduce touch points, many kiosks can be equipped with voice control prompts and hands-free video calling to allow for instant communication and directions.

Even as a vaccine is rolled out, the use of temperature checkpoints will likely remain an important tool for ensuring public comfort and inspiring public confidence in returning to offices and other buildings.

AR-BASED WAYFINDING

Beyond temperature scanning, wayfinding technology backed by AR will also be important for building accessibility in the future. One example of this is on a large corporate campus. A visitor could approach a digital sign with built-in wayfinding, scan the map with a QR code, access the most direct or required route (i.e., one-way traffic only to reduce physical touchpoints), and with AR capabilities, be given step-by-step directions through their smartphone's camera. This technology allows FMs to easily map out routes for building occupants and helps ensure compliance as buildings reopen and prepare for the future.

The ability to add pop-up notifications as a user is walking through a route is also compelling. For example, a notice about a restricted section of a building or an area with bathrooms, is easily seen in real-time instead of having to navigate back to a mobile or physical map.

SENSORS FOR POWERFUL, ACTIONABLE DATA

The ability to access detailed occupancy and building data is a game changer for FMs looking to closely monitor occupancy, set increased regular cleaning schedules and make decisions on space management, along with other important facility considerations.

Take for example, a large office building that is phasing in employee reoccupancy. Sensors embedded in lighting, displays and meeting rooms are all collecting data on how a space is being used.

FMs can use this data to plan space allocation or schedule cleaning for workspaces that are rotated out or even relocated if a department or employee is infected. If they find that a certain meeting space is consistently not being used, or being used more frequently upon building reopening, they can dedicate additional cleaning time to that space. They could also use that same data to make decisions that feed into office management and IT teams.

Hotdesking is the ability to quickly and efficiently adjust or dedicate spaces for work or meetings. This practice can help employees feel safe about the desk, office or meeting room they are occupying, when it was last cleaned and who the last occupant was for contact-tracing purposes. It is another example of how sensor-based data can be made actionable. This floor-plan data can be leveraged by management teams to determine new approaches to social distancing to gain insight into which floor configurations are working and have real-time access to how employees are navigating within the office space.

FMs can leverage usage data gleaned from sensors, voice commands and more to auto-generate the best schedules and shortest paths to ease of accessibility, with health in the forefront of the analysis.

Building data can also be leveraged for making decisions around improving energy footprints — the move toward sustainability continues gaining momentum as FMs are tasked with finding ways to ensure buildings are operating within energy efficient guidelines.

CONCLUSION

There are a multitude of considerations for FMs in preparing buildings for reopening and ongoing management post-COVID. Communication technology such as digital signage, wayfinding and content management systems bring people together, communicate changes and important messages, streamline operational costs and resources, and support productivity. When implemented into a larger operations plan, this technology is an important tool to bring teams back to work safely and keep businesses working effectively. FMJ

Tomer Mann *is the executive vice president for 22Miles. As a veteran in the digital signage industry, Mann strives to enhance visual communication consulting services to higher education, hospitality, retail, transportation, government, corporate, venues, health care and other large organizations.*

FORM & FUNCTION

Choosing the right anti-slip floor coating

BY KEVIN KLOTZ

Many factors pose risks to people who work in or visit a facility, but one of the most common is right under their feet. Slip-and-fall accidents account for more than 1 million emergency room visits each year. This is not only a danger to individuals, but also a significant risk to employers and facility managers.

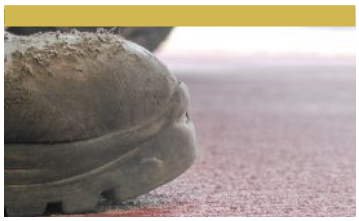
Employees slipping on slick floors account for 85 percent of worker's compensation claims, according to the Industrial Safety & Occupational Health Markets 5th edition. Preventing falls is also a key liability concern for facilities that are open to the public.

For FMs, demonstrating vigilance to prevent accidents is one of their most important responsibilities. If buildings have concrete floors, selecting the right coating system is critical in demonstrating safety concerns and taking the right steps to provide protection for occupants.

Not all concrete floors are the same. They vary depending on how they are used, by whom, and where they are located within the building. Even how they need to look can be a factor in the level of slip resistance they provide.

Determining the right anti-slip coating for a given floor requires a balance of form and function. To illustrate this, there are three areas within any facility where a concrete floor can exist:

- **Loading docks and parking ramps**
- **Warehouse, mechanical, maintenance, or production areas**
- **Office, lobby, or other publicly accessible areas**



Loading docks & parking ramps

In these areas, it is almost always all about function.

How the floors look is often of little concern. Although there may be a desire to use color and markings on the floor to delineate parking spaces, walkways, and vehicle traffic areas, the anti-slip function is far more important.

Depending on the facility, these areas are home to constant activity that can be dangerous to people on foot. The crisscrossing traffic of forklifts, palette carts and vehicles traffic — along with the possible presence of water, oil, ice and salt — make it crucial for people to know what to expect as they maintain their footing.

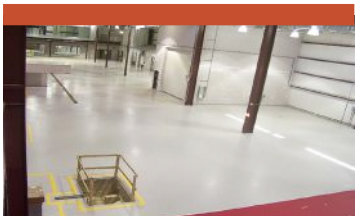
Beyond anti-slip performance, wear resistance is also important in these areas. These floors take some heavy punishment, so any coating system must hold up over time.

Floors like this require a safety-grip coating system specially formulated to provide maximum slip resistance and extraordinary durability.

The slip resistance is primarily a function of the thickness of the peaks and valleys of the coating, which creates a rough surface that increases friction and grip. The thickness is determined by the application technique as well as the coating itself.

The greater the thickness, the more slip resistance is provided. For safety walkways, ramps and transit platforms that have heavy foot traffic but only light wheeled traffic, an epoxy ester-type coating with a thickness of 15-25 mils will likely be sufficient.

For loading docks and other areas with heavy wheeled traffic, epoxy coatings with a thickness of one-thirty-second to one-sixteenth of an inch is recommended. If oils, solvents or other chemicals are likely to be spilled on the floor, coatings that offer excellent chemical resistance will be needed.



Warehouses, maintenance, mechanical and production areas

In certain areas of a facility, form is a little more important, as the floor needs to look clean and professional. There might also be a need for colors and markings to delineate walkways, production zones, restricted areas and vehicle pathways.

Unlike loading docks, these floors need to look good while providing the right amount of slip resistance. They also often need to withstand cleaning chemicals, oil spills, dropped tools and traffic from pedestrians, light equipment, and sometimes even heavy vehicles.

These areas might include warehouses and storage areas, manufacturing production floors, automotive repair shops, aircraft hangars and fire houses. In these areas, safety is paramount, because there is often a lot of foot traffic, giving way for accident opportunities.

The coatings used for these floors get their anti-slip properties from a broadcast media that is applied as part of the coating system. Usually sand or quartz, the media provides texture to the floor, making it safer to walk on, yet smooth enough to clean.

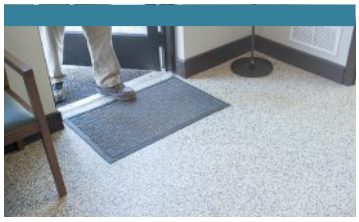
In addition to anti-slip performance, using sand or quartz also helps to protect the floor from impact damage, like from dropped hand tools and similarly sized objects; no coating can protect a floor from large objects, like a dropped 300-pound transmission, hitting the floor. The broadcast media is applied with the mid-coat, creating a coating that is up to one-eighth of an inch thick, which provides exceptional durability.

With these systems, there is also the option of adding color to the floors. With sand broadcast systems, the color is provided by a pigment in the topcoat. In quartz broadcast systems, the color

comes from the colorful granules applied into a clear coat. In either case, the color options and combinations are nearly unlimited, so the floor can include some functional design to guide pedestrians and even provide a distinctive, professional look matching any need.

The specific coating system used for these floors depends on the use. For most floors requiring basic slip resistance and durability, a 100 percent solids epoxy mid-coat applied with either sand, followed by a 100 percent solids epoxy topcoat will offer sufficient performance. In cases where a faster return-to-service is needed, a polyaspartic product can be considered.

However, if the floor is exposed to tougher punishment from ultra-violet light, abrasives, hot tires and chemicals, a polyester urethane topcoat is preferable. This will protect the floor from damage and wear, while also offering slip resistance.



Offices, lobbies, and public-facing areas

Finally, opposite from loading docks on the form-versus-function spectrum are floors in more public-facing areas. These floors, as in offices, retail stores, showrooms, institutions and schools, do not have to endure the harsh punishment that some of the floors mentioned above do.

In these applications, the way the floor looks takes on much greater importance. They must project a clean, professional image, or reflect the brand of the building owner or tenant.

Slip resistance is not as much of a concern as it is in a loading dock or a warehouse, where the presence of liquid spills and heavy equipment compound the danger. But from a liability standpoint, it is still a major concern.

With buildings that are open to the public, FMs cannot always control who comes in and out, and what kind of footwear they are wearing. People walking into a building are not necessarily cognizant of slipping, like a warehouse or loading dock worker would be. There is also the potential for water, snow and salt to be tracked onto the floor, creating slip-and-fall risks that the maintenance staff may not immediately notice.

Also, these floors must be kept clean for a professional look, so the concrete must be protected from common cleaning chemicals. Some floors, as in airports and schools, endure constant foot traffic, which can wear down floors.

While form is important in these areas, there are coatings that offer slip resistance in a more modern commercial look, instead of an industrial feel.

The concrete floor coating options for these environments are as limitless as the facilities themselves. For example, a coating system that includes an epoxy mid-coat, micro-tech flake broadcast, and polyester urethane topcoat is ideal for floors that are lightly used yet highly visible, as in retail.

A quick-service restaurant, transit terminal or automotive showroom would benefit from a multi-component system that includes a UV-stabilized epoxy with a metallic pigment and a polyester urethane topcoat. This system not only provides wear protection and durability, it also offers a distinctive luster reflected in the metallic pigment.

A flooring expert can help

For floors like these, it is important to consider the use, amount and type of foot traffic, and even the climate to determine the right anti-slip coating. Because there are so many options and variables, consulting a floor coating professional is highly recommended.

The coating system that is right for any given floor is not necessarily a cut-and-dried decision. There are many factors and variables that go into floor coating specification, including the need for slip resistance, exposure to the elements, the state of the concrete, and even the heat and humidity of the space during application.

Whether it is new construction or re-coating existing concrete, FMs would be well-served to choose an experienced, professional floor coating contractor along with the right coatings system from a reputable manufacturer to specify the right coating system for the job. FMJ

Kevin Klotz *is president of Coatings For Industry, Inc., a 50-year-old formulator of coating systems for concrete floors as well as for steel structures, aerospace, and specialty applications. He has provided technical support for floor coatings professionals for more than two decades. He is a graduate of the Florida Institute of Technology.*

A HYGIENIC CULTURE

Creating Healthy Spaces in a COVID-19 World

BY KELLY WALOWSKI

As facilities and businesses increased focused on wellness over the past decade, the desire for cleanliness has also increased. The convergence of COVID-19 and the heightened awareness of hygiene in public spaces has created an evolved version of this idea: creating healthy spaces.

Employers are navigating new concerns about the workplace. In a PwC survey, 51 percent of employees said they fear getting sick at work and 47 percent feel that their employers need to change workplace safety measures for them to feel safe.

FMs are also facing their own set of challenges, such as including complying with public health guidelines, implementing responsible practices, protecting people in their spaces and overall occupancy concerns.

As business leaders figure out how to bring people back to work and facilities safely, it is more important than ever to make employees and tenants feel safe.

The solution is to create safer, hygienic places to live, work, learn and play. Laying the foundation can be established through seven principles for healthy spaces:

Improve indoor air quality (IAQ)

IAQ has always been important, but the onslaught of the COVID-19 pandemic has made it critical. Many studies have shown that the primary transmission route of the coronavirus is airborne, respiratory droplets and smaller aerosols that can linger in the air for hours. That certainly does not make employees and tenants feel great in a space where a single cough or sneeze can expel germs as far as 27 feet and almost 100 mph.

In October 2020, the U.S. Centers for Disease Control and Prevention (CDC) updated its guidance on how COVID-19 spreads to reflect these concerns, recommending proper ventilation of indoor spaces as a mitigation strategy. This can include enhanced filtration with upper MERV value filters, opening windows, increasing local exhaust and using portable air purifiers with HEPA filters.

If managed poorly, indoor air can be a primary source of infection, spreading disease, COVID-19 and otherwise, quickly and widely in closed environments. This creates anxiety for people in those spaces, whether it is where they live, work, learn or play. In a recent study by Carbon Lighthouse, 74 percent of respondents said office IAQ data would make consumers feel more comfortable about their safety. Managed correctly, however, buildings can defend against contamination using air purification as part of an integrated hygiene program. A visible cue, such as an air purification system in the office, provides a psychological benefit that health and safety are of the utmost importance.

Spaces that typically experience air quality issues include break rooms, communal working areas, kitchens, meeting rooms, reception areas and lobbies. Having an air hygiene solution is vital for any shared space to maintain a level of confidence and reassurance that wellness is a top priority.

Make surfaces safe

Although health experts have downgraded the likelihood of contracting COVID-19 by surface transmission, it's not impossible. With cold and flu season knocking on the door, the risk of other pathogens thriving and spreading via surface contamination is high.

Traditional cleaning is not enough as evidence shows spray-and-wipe methods can miss up to 50 percent of surfaces. To be effective and align with the CDC's guidance, cleaning should be done in combination with routine disinfection services conducted by professionals.

In most facilities, there are a number of high-touch contact points that can cause a threat to spreading COVID-19, such as door handles, handrails, switches and buttons, remote controls and faucets.

Create a culture to support hand hygiene

Adults touch as many as 30 objects in 60 seconds, and contaminated hands can transfer viruses up to 14 other surfaces and subjects. To limit the spread of illnesses, establish a culture of hand hygiene. This includes getting buy-in from senior leadership, communicating hand hygiene requirements to staff, providing training, monitoring compliance and pursuing continual improvement.

Studies show that the distance to handwashing stations can impact compliance, and in a recent study by Rentokil Initial, 87 percent of respondents expect their employer to provide hand sanitizer in the workplace. By implementing alternative measures such as hand sanitizing stations in high-traffic areas, such as restrooms, entrances and exits, desks and kitchens, businesses can boost hand hygiene compliance. Not only will this help to stop the spread of germs, but it will also improve the image of the business or facility.

Promote cleanliness through scenting

How a space smells matters. A recent study by Initial found 47 percent of people believe if the air smells, it contains a large number of bacteria.

Capitalize on this powerful sense to create a positive sensory experience. When olfaction is engaged in combination with other senses, it can increase brand impact on the consumer by 30 to 70 percent.

Businesses can leverage scenting to help foster confidence in a healthy environment and offer the reassurance of well-being to amplify feelings of cleanliness by using fresh, bright scents in a space. The right scents can trigger connections with clean, such as zesty citrus, energizing mint and fresh cucumber.

Design for social distancing

As businesses more forward, companies may offer a phased return of staff and staggered work times to reduce congestion, as well as help those using public transportation to avoid peak times.

Haphazard social distancing practices can make a mess of facility. Plan ahead for social distancing, which does not have to just include taped-off areas and empty desks. There are many solutions that will be not only effective, but make tenants and employees feel safe as well.

Make flexible office design part of a healthy workplace agenda through the use of plants, modular partitions and green wall dividers. Create more defined outdoor spaces, parklets and enclosed patios with planter borders. Introduce one-way systems, new designs for desks and equipment as well as desks facing away from each other.

These elements can be easily moved to create function and versatility, such as separating larger areas to shape private spaces, encouraging social distancing and creating directional pathways. Modular design elements can feature whiteboards or add value through the use of moss, live or replica plants.

Bring in nature's benefits with biophilic design

Businesses can reap rewards by incorporating nature into their commercial spaces through biophilic design, which capitalizes on humans' innate desire to interact with nature for positive benefits.

It has been shown that people spend more time in and return more frequently to areas that incorporate plants and natural elements. Biophilic design has also been shown to reduce employee absenteeism, improve health, increase positive mood, amplify productivity, boost employee engagement and combat stress and fatigue.

To design a space with biophilia in mind, utilize plants of varied heights, forms colors and placements. Other basic elements of biophilic design include using plants, lighting, scents, water features and natural elements to soften harsh commercial spaces.

Measure progress

For multi-location facilities, it can be difficult to know whether protocols established to limit the spread of COVID-19 are being executed across all locations.

Audits have been utilized in other industries for decades to ensure quality, safety and public health compliance. This same process can be used in any business to measure COVID-19 compliance, frontline preparedness and issue resolution capabilities. Some of the most common items for evaluation and coaching include: following local health department guidance, wellness policies, social distancing measures, hand hygiene, face masks and PPE and COVID-19 exposure-response.

While in-house teams can perform audits, using a third-party assessment firm provides objectivity, cost-effectiveness and helps ease concerns in times of travel restrictions. Feedback from an outside expert can also provide supplemental staff training, as well as insight into industry best practices.

There are many facets to creating a healthy and hygienic workplace, but these principles can help any organization structure the foundation of a program that helps employees and tenants feel safe, protected and healthy while they are in the shared space. Proper investment in facility hygiene will not only benefit a business by introducing a safer working environment for employees and provide reassurance that it is safe to return to the office, but also may increase productivity as well. FMJ

Kelly Walowski *is the global account consultant for Ambius. With a layered approach, she helps brands inspire confidence with every interaction through a broad range of solutions including air purification, hand sanitizer, plants, green walls and scenting.*

SANITATION EVOLUTION

The unpredictable future of cleaning solutions

BY CHRIS JOHNSON, GEORGE SCHMIDT & JOEL WHEATLEY

At the onset of the COVID-19 pandemic, facility managers found themselves quickly transitioning from their traditional roles and learning how to become first responders. Charged with deploying multifaceted respons e plans to reconfigure facilities and reorganize the people who maintain them, their objectives were to create safe operations to ensure business continuity.

Looking back, these men and women took on an unprecedented task and did so nearly overnight as the pandemic quickly spread throughout the world. Beginning with recognizing the FMs who led facilities during such challenging times, industry leaders can now look back at the year to understand what took place, what the best practices for combating COVID-19 are and how the industry can improve in the future.

The realization that the pandemic had arrived and that it was going to have significant impacts on families and economies began in March of 2020. Medical experts sought to understand the virus while industry experts began developing response plans to assist with business continuity. Innovators and inventors launched products into the marketplace to help mitigate impacts. Governments, airlines and other corporations implemented restrictions and rules. These efforts, while generally well-intentioned, resulted in a flood of new information and products. Distilling what information was good versus dated, which products were effective and how to develop all of this into a response package was a daunting task. For industry leaders, there is a responsibility to look back and synthesize the solutions found to have merit, how this unprecedented event was responded to and the approach to the pandemic moving forward.

Before the pandemic, FM best practices were typically focused on comfort, perception and efficiency. Since then, they have evolved to focus on healthy and safe environments.

WHAT DOES THE FUTURE LOOK LIKE?

Short answer: It is unpredictable, but following written pandemic response and business continuity plans, focusing on employee and building occupant health and safety, and following best practices should be the primary courses of action.

Before the pandemic, FM best practices typically focused on comfort, perception and efficiency. Since then, they have evolved to focus on healthy and safe environments. Effectively communicating updated or new best practices, and any internal or external changes, is the first step to successful service delivery. It is also important to closely monitor regulatory authorities with jurisdiction, such as global or government agencies, to ensure timely and relevant guidance in a shifting environment.

HVAC

Changes to ventilation configuration was one of the earliest proposals, as the extent of virus aerosolization was still being understood. As this threat became realized, recommendations such as increasing fresh air supplies, installing MERV-13 filters (or higher) and making changes to the air distribution gravitated away from being a recommendation and became a fundamental precept. Enhancements to cleaning the air in the stream, using techniques such as dry hydrogen peroxide, bipolar ionization and ultraviolet light, gained much attention.

Vetting these solutions and differentiating between which would help with COVID-19 versus simply improving indoor air quality, became contentious.

Review committees were essential for evaluating the countless product claims, performing efficacy testing, and determining industry conformity and regulatory compliance. Unfortunately, many evaluated solutions, which had highly ambitious claims and hopes for environmental approval, could not be validated, whereas other solutions were determined to be more situational with many "ifs" in order to achieve efficacy. In some instances, product marketing would begin by speaking about COVID-19 before subtly shifting to describing their product as an IAQ improvement. This bait-and-switch piggybacked on the buzz of COVID-19 solutions but did not offer any protections. There are more positive examples though, such as non-ozone generating bipolar ionization. Results were impressive and UL certifications could be proven. But it was clear that organizations needed a rigid evaluation program for new solutions, processes and technology to properly vet potential solutions before implementing them.

Janitorial Services Pre-pandemic, the first budget line to get reduced was typically janitorial. However, COVID-19 made janitorial services (and handwashing) an essential service and major priority. Routine cleaning was replaced with disinfection and full deep-cleaning service.

In March 2020, the EPA's List N was first released, and has evolved since its introduction to the janitorial world. If a product is on the list, it can be used to disinfect after cleaning. Yet, because disinfectant distribution was prioritized to health care facilities, the demand for these chemicals ultimately crippled the supply chain. Unless purchasers got in early, it was a hard press to find products, especially those with proven kill speeds less than one minute. The supply chain constraints have been solved except for nitrile gloves, but that is another issue.

At nearly every facility, cleaning and disinfection focusing on high touchpoints has become the new normal. For example, restrooms and locker rooms, doors, handles, fixtures and dispensers are cleaned and disinfected more frequently during business hours rather than just during the evening shift. Before the pandemic, Level 3 decontamination processes were primarily completed by third-party restoration vendors. Coupled with the appropriate procedures, PPE and specialized equipment training, authorized technicians can now perform these tasks, providing clients and building occupants a faster response.

NEW INDUSTRY STANDARDS

Many of the best practices used over the last year will continue throughout the pandemic and will possibly become industry standard. All employees, if they have not already, will develop muscle memory on mask- and glove-wearing, hesitation to grab door handles and other new safety practices. While custodial services receives the bulk of the attention, building maintenance technicians will need to take extra precautions to disinfect shared tools and equipment. The days of "if it looks clean, it must be" are over.

Throughout the pandemic, there have been many emerging products that claim to fight against either the spread of COVID-19 or eliminate it. But as previously mentioned, companies need to have an evaluation program to ensure the efficacy of any innovative process before it is presented to operators or clients. In some cases, utilizing third-party verification, such as a certified industrial hygienist to test the applicability of developing products, may be necessary. Many of these products, specifically anti-microbial surface protectants, UV disinfection processes and electrostatic spraying applications have all been used historically in hospitals, health care facilities and other controlled environments. The industry is now seeing them trending across a multitude of settings and facilities.

Despite the availability and distribution of vaccines, the pandemic is expected to continue through 2021. FMs have a responsibility to be as prepared as possible through continuity plans, flexibility, communication and keeping healthy. FMJ

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A Watchful Eye

Why environmental monitoring is key to safely reopening and maintaining building readiness

BY JIM PLUNKETT

For most facility managers, reopening from the COVID-19 outbreak will be the most important and stressful achievement in their careers. Yet, a November 2020 survey by Arizona State University and the World Economic Forum found that less than 20 percent of more than 1,000 responding companies were testing workers, citing cost and complexity as the biggest deterrents. "Not testing" is not a viable strategy and has only exacerbated attempts to contain a fugitive and mutating virus. Fortunately, the scientific community and specifically a group that includes public health, building science, epidemiology, industrial hygiene, civil engineering and environmental science specialists have developed environmental monitoring techniques that will reduce FM's coronavirus monitoring costs.

The Beginning

In the fall of 2019, no one was studying COVID-19, because no one knew the disease existed. By the end of March 2020, a pandemic was declared. Communities and schools began testing their wastewater for the presence of COVID-19, many finding positive results, often weeks before symptoms were observed. Unfortunately, wastewater testing data is limited because the lag time from infection to shedding through feces and urine and from recovery to when shedding stops, is unknown. Therefore, wastewater monitoring is primarily used for observing trends in the level of COVID-19 presence.

This left researchers desiring environmental data, not based on shedding in feces and urine. They already knew COVID-19 could be detected in air and on surfaces in COVID-19 wards in hospitals. They also knew the coronavirus survived on surfaces for several days, until October, 2020, when researchers from the Australian Centre for Disease Preparedness announced a laboratory study that showed the coronavirus survives for up to 28 days at room temperature.

This coronavirus surface survivability phenomena fueled a focus on surface testing as a potential early warning and monitoring tool that, when done weekly, can give FMs and public health specialists the ability to detect the coronavirus in facilities a week before any symptoms are observed in occupants.

FMs and health officers use this environmental surface testing data to determine optimum facility layouts to minimize exposure, which areas need to be recleaned and resampled and which occupants should be clinically tested.

The cost of testing

Clinical testing is the single most costly component of a COVID-19 response strategy with tests averaging US$100-$150 for a reverse transcription polymerase chain reaction (RT-PCR) test, considered the gold standard. They have a 24-72 hour turnaround time and are effective in detecting COVID-19 shed from both pre- and asymptomatic carriers.

Antigen tests (formerly called Rapid Tests by the U.S. Centers for Disease Control), identify specific proteins on the surface of the virus. These were the tests the U.S. government made the focus of its strategy before the White House COVID-19 outbreak in September. Unfortunately the U.S. government also allowed its use for large-scale asymptomatic screening without fully exploring the consequences.

In November 2020, after the CDC had already published a notice on false positives and false negatives associated with antigen testing, The New York Times published probably the most concerning study conducted by the University of Arizona. Researchers found the rapid test could detect more than 80 percent of coronavirus infections found by a slower, lab-based PCR test for symptomatic students and staff. But, when the antigen test was used instead to randomly screen students and staff members who did not feel sick (pre- and asymptomatic), it detected only 32 percent of the positive cases identified by the PCR test. "The data for the symptomatic group is decent," said Jennifer Dien Bard, the director of the clinical microbiology and virology laboratory at Children's Hospital Los Angeles (California, USA), who was not involved in the study. "But to get less than 50 percent in the asymptomatic group? That's worse than flipping a coin."

Does Environmental Monitoring Work?

Percent positivity is exactly what it sounds like: the percentage of all coronavirus tests performed that are actually positive, or: (positive tests)/(total tests) x 100. The percent positivity helps public health officials answer questions such as: what is the current level of COVID-19 transmission in the community and, is enough testing being done for the amount of people who are getting infected?

The University of Southern Florida (USF) is one of the first universities that implemented environmental monitoring as a component of its comprehensive COVID-19 response plan, and it has resulted in a positivity rate of only 0.002 percent as of the end of September, 2020. At USF, when an area shows contaminated surfaces during their weekly monitoring, students are removed and tested as opposed to mass testing.

To put USF's positivity rate in perspective, the state of Florida had a positivity rate of more than 12.5 percent on Jan. 3, 2020. "Asymptomatic individuals may never even know they are infected," said Donna Petersen, dean of the USF College of Public Health and

chair of the COVID-19 Task Force. “But while they may not experience any symptoms, they can spread the virus and infect more vulnerable populations. Environmental testing is a critical component in early identification of these cases.”

Almost a year since the pandemic was declared, the CDC is focusing on environmental monitoring as a primary method for screening and monitoring indoor spaces for the presence of COVID-19.

The Future — Mask Testing — It Can’t Come Soon Enough

Where environmental monitoring will prove most valuable has yet to be demonstrated on a large scale but holds huge promise. Swabbing masks, for example, as a substitute for invasive clinical antigen tests, or what the CDC previously called call rapid tests, which have been plagued with accuracy issues.

If someone were going to design a personal sampling device, it would probably look like a mask. Everybody wears one, they are worn all day and it is in contact with the exact part of the human anatomy where the virus lives and from which it spreads: the nose and mouth. They are also cheap and disposable so it is easy to provide masks and ask someone to return their mask for testing. A mask’s function is to collect coronavirus so it cannot be spread to others. Why not have the mask do double duty as both a preventer of the spread of coronavirus and collector of coronavirus for testing? It is the last logical component of any environmental investigation, going from wastewater to surfaces to source (individuals) before investment in clinical testing.

Building occupants can be asked to pick up masks when they come in on the last day of the week and drop them off at the end of the day. A few masks can be pooled and tested with one swab at a cost of about US$10 per person instead of US$100 per person. When a positive test result is found, those occupants should be clinically tested (even though it uses the same testing methodology). If samples are pooled, three occupants may need to be clinically tested if a positive mask test result is found. Because schools, universities, assisted living facilities, nursing homes, prisons and workplaces can require mask testing and because it is non-invasive, there should be little resistance.

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Jim Plunkett *is an environmental scientist and a former member of the USEPA Superfund teams responsible for investigating, monitoring and cleaning up some of the worst uncontrolled hazardous waste sites in the nation. He founded an environmental consulting company providing assessment, monitoring and mitigation of sites and facilities contaminated with hazardous and radioactive waste, petroleum products, asbestos andbioaerosols. He was recruited by the EPA, the U.S. Air Force and the Commonwealth of Massachusetts to establish and manage a nonprofit environmental technology center on the Massachusetts Military Reservation on Cape Cod, one of the nation’s largest superfund sites.*

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