



The Great Re-Assignment. Talent In Motion

By Kerry Stackpole, FASAE, CAE, PMI CEO/Executive Director



Kerry Stackpole

How do you view the manufacturing community? Is it that ever-changing, innovative environment where new ideas and clever technology thrives, or the center of drudgery and danger depicted in so many images, movies and television series? While news stories abound about employees' desire for better wages and empowering work as fuel for the "Great Resignation of 2021," the Fourth Industrial

Revolution is rapidly transforming the world of work in ways only portrayed in science fiction novels and broad imaginings about the future.

Artificial intelligence, robots, enterprise resource planning (ERP) systems, and the Internet of Things (IoT) are increasing the demand for skilled talent. Plumbing Manufacturers International delivers critical industry knowledge through its online education portal, webinars, technical briefings, committee meetings, and conferences throughout the year. With the potential for 2.4 million unfilled positions in manufacturing through 2028, the need to reimagine manufacturing work is ever present. It won't be enough to encourage students to consider manufacturing jobs. The new jobs of manufacturing need to be described from the perspective of the workers themselves, as they seek new career pathways, digital tools, and clear descriptions of the typical workday.

According to research by Deloitte and the Manufacturing Institute, "the pandemic outbreak initially erased 1.4 million U.S. manufacturing jobs, undoing more than a decade of manufacturing job gains. Though the industry was able to hire back 820,000 of these jobs by the end of 2020, the remaining 570,000 have not returned, although there currently stand close to 500,000 job openings." Job openings have grown at double-digit rates since mid-2017 and are nearing the historical peak recorded in 2001, highlighting a widening gap between the jobs that need to be filled and the skilled talent pool capable of filling them.

The search for skilled talent—ranked as the No. 1 driver of manufacturing competitiveness by global manufacturing executives—appears to be at a critical level. In 2021, 77% of surveyed manufacturers said they expect difficulties in attracting and retaining workers. The talent shortage seems to be exacerbated by two factors according to the Manufacturing Institute. "First, many manufacturers can't fill entry-level production associate positions. These are the jobs that do not require technical know-how or industry knowledge, such as team assemblers, production work helpers, and hand-held tool cutters and trimmers. Rather, they require a person who has a basic level of 'human capabilities,' such as following directions, willingness to learn, and follow-through. The second aspect defining the current shortage is that manufacturers increasingly have difficulty filling middle-skill jobs. These jobs typically require some level of technical training or applied skills. Examples include computer numerical control (CNC) machinists, welders and maintenance technicians. At the higher end of experience, some of these jobs require more specialized skills."

The challenges that apply to manufacturing in some ways mirror the difficulties of recruiting people to become plumbers. As plumbing fixtures and fittings become more sophisticated by incorporating sensor technology, voice commands, smartphone communication, water measurements, and the like, the demand for a well-rounded, technologically savvy person to handle these installations will only grow. It's not a stretch to imagine a plumber who makes all the plumbing and water connections to install a faucet or shower, connects

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Threat of Tariffs on Fireclay Sets BOCCHI To PMI Membership

By Ray Valek, PMI Communications Team, Valek and Co.

Last year, when the United States government began to consider imposing tariffs on products imported from Turkey, including fireclay, BOCCHI got serious about becoming a member of Plumbing Manufacturers International.

BOCCHI specializes in manufacturing fireclay kitchen sinks. The steep tariffs, which were threatened by the U.S. in response to Turkey's digital services tax, "would have essentially destroyed the fireclay market in the U.S.," said **Dawn Robinson**, BOCCHI director of marketing and communications. As the BOCCHI team began to discuss how to make a case to exclude fireclay from the tariffs, "the first words out of my mouth were 'we've got to talk to PMI. This is what they do. They've got a legislative branch that understands this,'" Robinson remembered. "That started a conversation between our company and PMI to find that foothold, and we're at the point now where PMI membership is vital for us." The tariffs were terminated in November 2021 after the U.S. and Turkey came to an agreement on digital services taxes.

Joining Robinson in advocating for PMI within BOCCHI was **Lars Christensen**, a long-time PMI member who joined BOCCHI in 2020 as director of product development. "Bringing Lars on marked a big turning point for the company because he helped us expand into other materials like granite," Robinson stated. "We had a small faucet line, and he came in and revamped that, completely inside out. Everything that we've been doing has just grown."

Christensen said that as the expansion of BOCCHI's product offerings and materials occurs, "membership in PMI gives us both a voice and connections within an ever-evolving plumbing industry. It connects us to that change in a proactive way." Robinson and Christensen, along with a new sales director the company is search-

ing for now, expect to be BOCCHI's main contacts with PMI.

"BOCCHI joins PMI at a time when our growth continues with broad industry support across many sectors," said **Kerry Stackpole**, PMI CEO and Executive Director.

Headquartered in North America in Alpharetta, Georgia, the company originated in Italy in 1950 and moved their international headquarters to Istanbul, Turkey, in 2008. The company's president and CEO is **Akgun Seckiner**, a long-time Georgia resident. BOCCHI first established a niche for itself with the fireclay sinks and added granite sinks, as well as faucets and bathroom collections in dozens of colors and finishes. Robinson explained that fireclay enables a manufacturer to create a bigger product – for example, a 36-inch-wide farmhouse sink that's 10 inches deep – because fireclay shrinks more uniformly than vitreous china does when fired in a kiln. And because it's resistant to heat and cold, it's good for outdoor kitchens, she explained.

BOCCHI's focus on zero waste and diversity in line with PMI and its members

In line with the goals of PMI and its members, BOCCHI is placing a strong emphasis on responsible environmental stewardship and zero waste, as well as diversity, equity and inclusion. "We're very focused on green," Robinson said. "We produce all of our ceramics in-house, and we're working toward having zero-waste facilities, with 100% percent of the water recycled and 100% percent of the product recycled. In the manufacturing process, if there's a small, pencil shaving-sized bit of clay that gets trimmed off a product, it gets saved and gets recycled back in, so nothing is wasted."



Robinson told a story about the company's holiday dinner, which occurred right before the omicron variant caused pandemic precautions to take hold again, to highlight the company's commitment to diversity, equity and inclusion, again in line with PMI. "I remember someone asking me to pass them something. And I said, 'How do you say that in your language?' because she was Vietnamese. And so she told me. And then everyone started going around the table saying how they say that in their language, which opened my eyes to the incredible diversity of our company. We have people from America; I'm Native American. We've got Turkish. Lars is originally from Denmark. We've got Vietnamese, Peruvian, Venezuelan, African American and Cuban. We've got people from Jamaica, Ukraine, Russia and South Korea. And many are expats – not only people with that heritage but they were born there and grew up there. And in our leadership roles, the executive team and management team, they're very diverse as well, with a mix of genders and ethnicities."

She said she hesitates to say diversity is a focus for the company. "It's just who we are," she said. "And I credit Akgun with that. He's never judged anybody on where they come from or what their gender is. If you can do the work and you can do it well, that's what matters."

McLeod & Wise Bring New Perspectives to PMI Board

By Ray Valek, PMI Communications Team, Valek and Co.

Joining the Plumbing Manufacturers International Board of Directors after being long-time members of PMI, **Cambria McLeod** and **Belinda Wise** look forward to bringing their perspectives to the group's work.

The director of business development in North America for Kerox, Ltd., Wise said she was thrilled to be invited to join the board and looks forward to making contributions. "I've always been impressed with the professionalism of PMI and the camaraderie between the companies that compete against each other. It's time I stepped up," she stated.

An engineering manager in codes, standards and regulations at Kohler Co., McLeod looks forward to having the visibility to see how PMI works beyond the committees and task groups she has been a part of before, namely the Technical Committee, Water Efficiency and Sustainability Committee (which she co-chaired), and California Task Group. "There's always an ample supply of code and regulatory changes to discuss and understand, and then work together with all the PMI members to meet common challenges."

While McLeod brings her deep regulatory and codes and standards experience to the board, Wise brings her experience of being both on the sales and purchasing sides, as well as her international background. Kerox is headquartered in Hungary and supplies major global brands as an original equipment manufacturer (OEM). Previously, she worked in Europe for PMI members Neoperl and American Standard, which is now a part of LIXIL. "I can bring my perspective of how things are done in Europe to help the companies that have factories outside of the U.S., or want to market their products here while being a stronger reference on U.S. technical issues to the Kerox team in Hungary," Wise stated.

As sustainability becomes a greater emphasis for plumbing manufacturers in relation to helping mitigate climate change, McLeod's experience in water efficiency will expand to address challenges such as waste reduction and extended producer responsibility. "Regulations will continue to increase in this realm and I look forward to collaborating on PMI's climate change initiatives and zero waste initiatives," McLeod stated.

Wise said she hopes to augment her sales and purchasing experience by becoming more knowledgeable about PMI's technical and government affairs activities. "I think we should all be more familiar with the big picture," she stated. With many of PMI's larger companies already accountable to stakeholders on sustainability and waste reduction, Wise said she hopes they share their strategies on these matters with PMI's smaller members. "It will be great



Belinda Wise, Kerox, Ltd., and Cambria McLeod, Kohler Co.

to see what we can accomplish over the next few years, but it's not going to be a quick fix or a quick plan. It's going to take some time," she stated.

McLeod and Wise join the rest of the PMI board led by president **Martin Knieps** in addressing a range of industry issues in addition to water efficiency and waste reduction. These issues include diversity, equity and inclusion; Internet of Things and artificial intelligence technology; consumer privacy; trade; public health and safety; and more. Read more about the 2022 PMI board at tinyurl.com/2p99h7p8.

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it to your home wireless system, and verifies its operation using a voice-activated speaker or your smartphone before handing you the instruction manual and an invoice.

PMI supports workforce development initiatives through our Aspiring Leaders Program, which brings together college students and the industry's aspiring leaders at events designed to educate, illuminate and empower their thinking about what it means to lead and how to use the skills they acquire during the program to accelerate their careers. The program's focus helps participants to develop skills leading to innovation, managing multi-generations in the workplace, and demonstrating exemplary leadership, among other topics. Among the many responsibilities of leaders is assuring those who follow us have the skills to lead themselves and others to navigate the future with clarity, passion and focus. That's plumbing manufacturing today and it's only getting better tomorrow. Let's get to work.

Climate Change Adds Momentum to Plastic Management Efforts

By Ray Valek, PMI Communications Team, Valek and Co.

Domenic DeCaria of the Vinyl Institute presented on “Industry and Regulatory Trends in Plumbing Plastics” at the PMI21 Manufacturing Success Conference.

DeCaria, the institute’s technical director, described the various factors driving change in legislation, regulations, industry standards, and sustainability initiatives relating to plastics. “There are opportunities to be a credible part of the solution to the climate problem that we have,” he emphasized.

Among the legislative trends are the recently passed bipartisan Infrastructure Investment and Jobs Act, which includes \$55 billion for water projects and environmental justice requirements. Anti-plastics bills, including the Break Free from Plastics Pollution Act and the Clean Future Act, were introduced in the U.S. Congress in 2021. The concept of “extended producer responsibility” is

resulting in legislation calling for recycling funding and mandates in several states, he said.

Federal, state and provincial regulators in the U.S. and Canada are also taking a harder line on plastics, with agencies asking open-ended questions about manufacturing processes, designating some kinds of plastics as “toxic,” and drafting regulations banning certain types of single-use plastics. Plastic pollution has become an environmental justice issue because of how it can affect communities in close proximity to plastic production and waste sites, DeCaria explained.

As they develop sustainability frameworks, industry standards groups are seeing increased involvement from the EPA, OSHA, and the CDC, DeCaria stated.

With the corporate sector working to reduce their carbon footprints, green procurement principles are extending

beyond the primary product to include the entire supply chain. Environmentally savvy purchasers and consumers demand transparency and will only expect more in the future, DeCaria explained.

To reduce the carbon footprint in the built environment, DeCaria said he expects to see increased energy-efficiency minimums via building codes and appliance regulations, increased adoption of advanced energy-efficient technology by building owners, and reduced carbon impact of materials and products by suppliers and processors.

DeCaria said suppliers and processors can reduce carbon by integrating recycled content into their products, sourcing raw materials from a closer location, reducing the energy used to manufacture their products, and using renewable energy.

Flexibility Key to Complying With Data Privacy Laws

By Judy Wohlt, PMI Communications Team, Valek and Co.

Individual states continue to create their own data privacy laws, making compliance more complicated for plumbing manufacturers. Creating a flexible compliance program will help companies adjust faster as more states add new laws.

Joan Stewart, an attorney with Wiley Rein LLP, offered compliance tips at the PMI21 Manufacturing Success Conference.

She explained that an absence of comprehensive federal data privacy legislation means companies need to better track individual state laws. California, Virginia and Colorado currently have their own data privacy laws. The California Consumer Protection Act (CCPA) went into effect on Jan. 1, 2020. An amended CCPA, called the California

Privacy Rights Act of 2020 (CPRA), will take effect on Jan. 1, 2023. The Virginia Consumer Data Protection Act also will take effect on Jan. 1, 2023, while the Colorado Privacy Act becomes effective on July 1, 2023.

Stewart focused on the CCPA, which applies to for-profit businesses that collect and control California residents’ personal information and do business in the state. The law also applies to businesses that meet at least one of three qualifications: earn annual gross revenues of more than \$25 million; receive or disclose personal information of 50,000 or more consumers, households, or devices per year; and derive 50% or more of annual revenues from selling California residents’ personal information.

More state data privacy laws are expected to pass in 2022 and 2023. To adapt to changing laws, Stewart suggested plumbing manufacturers build compliance plans that start with a risk assessment. Be sure to develop a comprehensive data map that tracks how your company collects and uses consumer data across all departments, she said. Also consider whether a state-by-state or nationwide approach will work best. Businesses may choose to base their assessments on California’s privacy law because it’s the most comprehensive of all current state laws, she said.

Stewart suggested implementing and auditing processes for responding to consumer requests, adding data opt-in protocols on company websites, and planning for consumer opt-out rights.

Expert Offers Antimicrobial Product Claims Guidance

By Judy Wohlt, PMI Communications Team, Valek and Co.

Claiming a bathroom fixture is antimicrobial may seem simple enough. However, manufacturers considering making such claims must follow federal pesticide regulatory requirements – or face steep penalties from the Environmental Protection Agency (EPA).

What do pesticides have to do with treated bath or kitchen fixtures? EPA focuses on the intent of a product and the claims the product makes, explained **Thomas Brugato**, special counsel with Covington & Burling LLP, during his presentation at the PMI21 Manufacturing Success Conference.

For example, if a manufacturer claims its bath faucet is antimicrobial or antibacterial, EPA requires the company to register the entire faucet as a pesticide, he said. Registering an entire product as a pesticide would be a tedious and costly process.

However, EPA provides a “Treated Articles Exemption.” To be exempted, treated products must meet two requirements: 1) the pesticide is intended to “protect the article...itself” and 2) the pesticide is “registered for such use,” Brugato stated.

He suggested plumbing manufacturers get to know EPA’s primary guidance document, “PR Notice 2000-1” (tinyurl.com/3hkthcfw). It provides details about how claims to kill disease-causing organisms are not permitted and provides examples of claims that are and are not acceptable.

Claims must be limited to the product itself, Brugato explained. For example, an acceptable claim listed in PR Notice 2000-1 states, “This product contains an antimicrobial agent to control odors.” An example of an unacceptable claim would state that the product “controls allergy-causing microorgan-



Thomas Brugato, Covington & Burling LLP

isms,” because the claim promises a human health benefit. Other unacceptable claims promising human health benefits would describe a product as “antibacterial,” “germicidal” or “provides a bacteria-resistant surface.”

The notice also discusses cases when the guidance isn’t clear on making a claim. EPA manages those claims on a case-by-case basis. For example, a company can claim a product is antimicrobial but must qualify the statement by stating that antimicrobial properties are “built in to protect the product.”

Uniform Protocol Can Aid Plumbing System Maintenance

By Judy Wohlt, PMI Communications Team, Valek and Co.

How can the plumbing manufacturing industry help building owners gather digital insights to better maintain building plumbing systems? One company has proposed creating a standardized protocol that will connect all plumbing devices for easier monitoring.

Reed Controls, Inc. (reed), has identified about 24 million properties in the United States that don’t have a smart water management solution; this number presents a huge opportunity to plumbing manufacturers, said **Avi Yurman**, co-founder and head of product for reed. He added that these properties waste about 900 billion gallons of water annually, mostly due to leaky plumbing fixtures, irrigation systems and cooling towers.

The company has built a network of plumbing manufacturers to help develop and deliver a smart water technology protocol. Yurman invited more manufacturers to join the network during his presentation at the PMI21 Manufacturing Success Conference.

Defining such a protocol will accelerate the growth of the smart and connected plumbing industry, particularly in the commercial seg-

ment, he noted. This standardization will deliver a scalable technology that allows compatibility and interoperability between fixtures.

The system works by getting plumbing manufacturers that make mixing valves, meters, pumps and actuators to embed firmware into their electronic devices or add sensory products to measure temperature or pressure, Yurman explained. Information from the firmware and sensors is easily gathered using a Local Area Network (LAN) and standard Transmission Control Protocol/Internet Protocol (TCP/IP) connections and then shared through a single app. This allows building owners and others to view all information in one place while still having the flexibility to choose products from different plumbing manufacturers, he said.

The technology provides building owners with real-time information on plumbing systems to detect leaks and water waste. Yurman shared an example of how his company’s system and app was installed in a 400-unit community housing building and revealed \$2,200 a month in water waste.

PMI21 Panel Highlights Value & Necessity of Water Efficiency

By Ray Valek, PMI Communications Team, Valek and Co.

A panel of five professionals discussed the importance of creating more awareness about the value and necessity of water efficiency during the “How Water Efficiency/Conversation is Changing in an Era of Growth and Drought” session at the PMI21 Manufacturing Success Conference.

The group included **Veronica Blette**, chief of the Environmental Protection Agency’s WaterSense Program; **Heather Cooley**, research director, Pacific Institute; **Jacob Atalla**, vice president of sustainability initiatives at KB Home; and **Elizabeth Lovsted**, water resource manager, San Diego County Water Authority. **Troy Benavidez**, co-chair of the PMI Advocacy and Government Affairs Committee and leader of government relations and policy, LIXIL International, moderated the panel.

Lovsted spoke about how the authority promotes water efficiency and ensures water reliability in the PMI21 host county of San Diego. “We serve 3.3 million people and support a \$231 billion economy. It’s very important to make sure that we have reliable sources of water,” she stated. To promote water conservation, the authority has provided rebates or other incentives for installing water-efficient toilets, showerheads, bathroom faucets and aerators, including a program that provides assistance for low-income households.

Water efficiency achieves energy savings and greenhouse gas reduction

Cooley explained how the Pacific Institute gathered and analyzed quantitative data to demonstrate how water conservation and efficiency achieves energy savings and greenhouse gas reduction and how saving water is the “fastest and least expensive way to meet our water challenges” compared to other water supply options. She introduced the institute’s CEO Water Mandate, which has mobilized 200 corporations to ad-

dress global water challenges through better water stewardship.

Representing a company that builds homes across the southern portion of the United States, where many areas have water shortages, Atalla said KB Home has built 17,000 energy-efficient homes using more than 800,000 WaterSense fixtures over the past 10-plus years. “Sustainability for us extends from energy to water efficiency to healthier homes and healthy communities,” he stated.

Atalla said KB Home uses the HERS H2O water-efficiency rating system to measure the projected water-efficiency of their homes and to set goals for measures such as the use of imported water. The company also provides customers with an Energy Performance Guide that compares the energy consumption of various floor plans and how that translates into future energy costs.

PMI members voluntarily advance water efficiency through innovation

Blette emphasized that the WaterSense Program contributes to water efficiency and innovation, as well as to infrastructure, sustainability and affordability. “We also view ourselves as a climate mitigation program because as we use less water, we’re using less energy,” she explained. She credited PMI member companies for voluntarily advancing efficiency through innovation, with the federal water-efficiency standard unchanged since the 1990s.

However, Blette did advocate for federal funding to create incentives to replace older, less-efficient fixtures. She mentioned a recent study that estimated average toilet flush at about 2.2 gallons, below the federal standard of 1.6 gallons, and said studies by PMI and the Alliance for Water Efficiency show significant percentages of homes and businesses without water-efficient toilets, showerheads and bathroom faucets.



“Getting inefficient fixtures out I think is going to be really important in the next several years,” she stated.

Both Lovsted and Cooley added that new technologies, such as devices that detect leaks or unusually high water use, will help create awareness of the need to fix or replace plumbing fixtures and fittings both in residential and commercial settings.

“There are still significant opportunities in non-residential sectors – commercial, industrial, and institutional,” Cooley emphasized. “Through our CEO Water Mandate program, we are getting companies to understand the water risks for their operations, either in their direct operations or in their supply chain.” She said companies are increasingly seeing water risks through the sustainability lens and have interest in solving the sustainability challenges our society faces. “I see a cutting edge area where companies have energy and climate change goals and are starting to think about how does water connect with that? That’s an emerging trend and I think an important one,” she stated.

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To purchase video access: tinyurl.com/4edhvx3u.

View PowerPoint presentations at tinyurl.com/bddxrync.

Supply Chain Expert Shares Helpful Risk Assessment Tips

By Judy Wohlt, PMI Communications Team, Valek and Co.

A volcano in Iceland caused a company's manufacturing plant in Cleveland, Ohio, to shut down, triggering a domino effect of disruptions management never saw coming.

How could the company have prepared for such a catastrophic outcome? Start with a detailed risk assessment and involve customers and suppliers in the planning process, said **David Pyke**, Ph.D., professor of operations and supply chain management at the University of San Diego School of Business.

The volcano incident was one of several scenarios Pyke shared with those attending his interactive session on "Enterprise Risk Management" at the PMI21 Manufacturing Success Conference. Applying the scenarios, he led the group through a series of exercises to determine how they could prepare to reduce the impact of both major and minor business disruptions.

Participants broke into functional areas – such as operations, supply chain, marketing, sales, human resources, senior leadership and finance – to consider how each function could better understand risk management using a fictional business. The groups examined the likelihood and impact of certain events on the business and then planned mitigation and recovery steps.

Determine your organization's appetite for risk

To effectively manage risk long term, a company's senior leaders and board of directors need to know and communicate their risk tolerance to the rest of the organization, Pyke said. He asked, "What kind of attitude or tone are you setting as an organization that gets communicated to your people about how much risk you're willing to accept?"

Coordination and communication across all company functions must be a priority, too. "Having regular group

conversations and interactions is important so you know the ripple effect your decision can have on other functional areas," Pyke stated.

He defined risk as the probability of an event multiplied by its impact. Generally, events run the gamut from low impact, high probability – such as a snowstorm in the Midwest – to high impact and low probability like the COVID-19 pandemic.

Assess the likelihood and impact of both internal and external events that could affect your company's business objectives, Pyke suggested. Follow that assessment with plans to identify projects or activities that will reduce the likelihood and impact of those events if they were to occur, he added.

For example, Pyke said many companies are building redundancy into their supply chain plans by contracting with multiple suppliers located domestically, regionally and internationally. Some keep excess capacity or maintain multiple manufacturing facilities where one plant can produce standard products while another one can shift production to more specialized products if necessary.

Good leadership can make or break how a catastrophic event impacts a company. To illustrate leadership's influence, Pyke described how **Arnold Schwarzenegger**, former governor of California, had prepared well for a potential pandemic by using a budget surplus to buy ventilators, mobile hospital units, and millions of N95 masks. Unfortunately, Schwarzenegger's successor hit a budget crunch and stopped



David Pyke with PMI Advocacy/Government Affairs Committee Co-Chair Lowell Lampen, Kobler Co.

maintaining those items – even though the cost was minimal. The situation left California unprepared to manage the fallout from COVID-19, Pyke said.

Involve suppliers and customers in planning

Engaging suppliers and customers in your company's risk assessment and planning process is vital.

Pyke advised using coordinated planning forecasting and replenishment (CPFR) to involve customers and suppliers in planning key supply chain activities to efficiently meet customer demand. CPFR is a set of practices that help streamline processes and supply chain planning while boosting inventory management.

"Giving your suppliers the decision rights to manage your inventory – by giving them daily sales information – can be a powerful thing," Pyke said. Making information available to customers and suppliers can help provide advanced warning of an unanticipated negative event that could impact your business, he added.

Gary Klein Links Customer Satisfaction to System Design

By Ray Valek, PMI Communications Team, Valek and Co.

Water- and energy-efficiency expert **Gary Klein** discussed the importance of right pipe sizing toward achieving customer satisfaction during the Jan. 19 Plumbing Manufacturers International webinar, "Let There Be Flow: Supply System Design for Peak Water Demand and Customer Satisfaction."

After reviewing the various methods for pipe sizing, Klein showed data that can be used for pipe sizing in different occupancies. The data compared Hunter's Curve, the basis of Uniform Plumbing Code (UPC) Appendix A, to actual peak flow rates and found that Appendix A requires about 10 times higher gallon-per-minute capacity than the peak hot water flow rate's 99th percentile observed at 16 different multifamily buildings located across the country.

Klein said the UPC Appendix M code gets much closer to the peak flow rate. He said he's working with a team of people who have petitioned the California Building Standards Commission to enable the use of Appendix M statewide. "We will have public hearings later this year, and we're hopeful it'll get adopted into the interim code cycle in 2023," he stated. He said Appendix M provides a safety margin of at least two and sometimes an average of three times the measured peak flow rates.

Where does all the pressure go?

Next, Klein answered the question, "Where does all the pressure go?" He said the plumbing code stipulates the pounds per square inch (PSI) allowable at a building's entrance. However, 80 PSI, for example, lowers as water elevates through a building and travels through pipes and valves.

By the time the water arrives at a showerhead on the second floor, for example, the pressure may be only 40 PSI, with the showerhead designed to be used at



80 PSI, resulting in customer complaints and dissatisfaction.

To mitigate this pressure loss, Klein encouraged the webinar attendees to re-evaluate their valves. "Some have tiny passageways. Once you close a diverter to the tub, there's a skinny hole going up to the shower head, and that's causing resistance. It's a big deal because what we want is zero loss on the way, if we can get it. We can't get zero, but 10 PSI versus four PSI is a big difference," he explained.

Klein also talked about the benefits of pressure-compensating aerators for showerheads and faucets to bump up pressure, no matter the PSI coming into the building. He also briefly mentioned a WE•Stand committee looking at rightsizing drain lines.

In response to questions from participants asking what PMI manufacturers could do to help, Klein said it would be helpful to have pressure drop versus flow tables for faucets, showerheads and other fixtures. He also said using the IAPMO Water Demand Calculator to gain and provide him with data about real flow rates in buildings such as hotels, office buildings, hospitals and airports will help to develop more practical codes.

PMI members can watch Klein's full presentation (under Technical/Regulatory) and other PMI webinars at safep plumbing.org/members/webinars-videos.

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