

AI Tops Discussion at CIDCO

BY DREW CHAMPLIN, ASHRAE JOURNAL EDITOR

DENVER, COLO. —Artificial intelligence (AI) became a hot topic in many sessions at the recent Conference for Integrated Design, Construction and Operations (CIDCO), held Aug. 13 –15 in Denver for more than 130 registrants.

Some key topics included generative design and AI, mastering energy modeling with master tools, embodied and operational energy lessons and opportunities outside building-scale new construction and intelligent building operations.

Dennis Knight, P.E., BEMP, Presidential/Fellow/Life Member ASHRAE, the Society's 2024 –25 president, moderated a panel called "Building Performance Analysis in the Age of AI." The panel featured insights from E. Mitchell Swann, P.E., Life Member ASHRAE, Krishnan Gowri, Ph.D., Fellow ASHRAE, Roya Cody, Ph.D., and Zheng O'Neill, Ph.D., Fellow ASHRAE.

Knight noted that ASHRAE has retained an AI consultant who understands an organization like ASHRAE and can help implement plans for retention and member access.

"(We're) wanting to be able to at least make it not the Wild Wild West where everybody picks their own tool and nobody collaborates with similar tools," Knight said. "(This is) to add some consistency, add some quality control, and at least start us on a path that we understand the path we're going down, whether it be business services, member services or technology."

Knight noted ways AI could reshape the built environment in the next five to 10 years.

"I think from a quality control standpoint, we're going to really soon see where these bots can read a set of documents, a BIM model and a set of contract documents like plans and specifications and do quality control and go through very quickly and find errors, omissions, conflicts, statements that are said one way here and said a different way there," Knight said.

"The other thing is, I think on the construction side, we're going to see a major ability to control quality control, and I'll use the building envelope as an example. Right now, commissioning a building envelope requires almost daily inspection, continuous inspection by somebody who knows how to put a building together. We're going to see

the age where cameras and imaging will be able to monitor that construction, and it'll be the same for the HVAC and the plumbing and the electrical. Monitor it continuously. Bounce it off the plans, the specifications, the manufacturer's installation instructions and industry standards, and at the end of the day, or in real time, tell a laborer, tell a supervisor, tell a design engineer. This is at variance with any one of those standards, be it plans, specs, standards, guidelines, regulations. Immediately give that feedback back and hopefully build better buildings and curtail some of the litigation that pops up eight, 10, 12 years after a building's been built because of construction deficiencies."

If Knight could add one sentence to any ASHRAE standard related to AI, he said it would be "User beware."

"Until we get more science built into these models, and these models have the ability to quality control their own answers, we're going to need the subject matter experts," Knight said. "We're going to need users that still understand fundamentals, physics, science and the basics of psychrometrics load analysis to know and to be able to have some intuition."

Another informative session was presented by James Petersen, P.E., Member ASHRAE, and Cheryl Saldanha, P.E., called "Dance Partners: How to Gracefully Integrate Building Form and Enclosure With HVAC." It brought up comparisons of embodied or operational carbon in buildings. Petersen and Saldanha also noted that communication skills with engineers need to be developed and emphasized more while in college.

They concluded that the pathway to designing successful HVAC in high-performance buildings requires the following:

- Start with compact forms and simple shapes to the extent possible.
- Use very low infiltration rates in heating/cooling load calculations.
- Use accurate assembly R-values, shading coefficients in heating/cooling load calculations.
- Right-size and simplify HVAC systems.
- Simplify HVAC designs by reducing perimeter heat.
- Develop exceptional collaborative skills.
- Adopt a whole building approach to HVAC design. ■