Department of Health Care Access and Information
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HOSPITAL BUILDING SAFETY BOARD
Energy Conservation and Management Committee

Thursday, October 7, 2021
9:00 a.m. - 3:00 p.m.

Teleconference Meeting Access:
HBSB GoToMeeting ECM Committee
Access Code: 917-826-381

Committee Members Present:
Roy Lopez, Chair
Scott Jackson, Vice-Chair
Louise Belair
David Bliss
Deepak Dandekar
Michael Foulkes
David Khorram
Michele Lampshire
Bruce Rainey

HCAI Staff Present:
Elizabeth Landsberg, HCAI Director
Chris Tokas, Acting FDD Deputy Director
Bill Gow
Dave Mason
Diana Scaturro
Jamie Schnick
Richard Tannahill
Nanci Timmins
Arash Altoontash

Consulting Members:
John Griffiths
Eric Johnson
David Lockhart

HBSB Staff:
Ken Yu, Executive Director
Joanne Jolls
Evett Torres

Other(s) Present:
Dan Diehl, CEO of Aircuity
Jeni Stockman, Macro-Eyes, Inc.

1. Welcome and Introductions

Mr. Lopez, Committee Chair, called the meeting to order on October 7, 2021, at 9:00 a.m., and HBSB Executive Director Ken Yu called roll.

Nine members of the Committee present constitute a quorum. There being nine present at the time of roll, a quorum was established.

Mr. Yu read the public announcement regarding COVID-19, OSHPD officially becoming the Department of Health Care Access and Information (HCAI) and meeting rules and procedures.

2. Indoor Air Quality Monitoring

Presenter: Dan Diehl, CEO of Aircuity

Discussion and public Input

Mr. Dandekar stated the implications of COVID 19 regarding the detected parameters of selected airborne pathogens and its challenges of swab tests (i.e., go to the labs and so forth). He explained that it would be incredibly beneficial if certain pathogens that are commonly present, such as Aspergillus, could be detected, and in the future, it can be fine to go further. Mr. Diehl responded they were looking from a product roadmap perspective and intrigued by the HVAC design perspective. They pull air samples from each individual location, then run it through a filter that could then be tested randomly. He also reported that the best thing that can be done is to control small particle levels, ensuring that 0.3 to 2.5-micron particle levels are reduced as effectively as possible, and the second thing is managing higher ventilation rates. There may be dead spots or a ventilation supply and demand that doesn't cause proper mixing and exhaustive air. Mr. Diehl declared a need to start treating the larger built environment as a critical environment, making it safer, more productive, and healthier for the occupants and ventilation effectiveness is going to be key and part of particulate measurement and mitigation.

Dave Mason expressed that relative humidity and airborne pathogens are important. Studies in China have found that when somebody coughs or sneezes indoors with COVID, they found it 27 feet away because it is traveling as such small particles. He suggested to keep in mind that CMS funding is tied to minimum ventilation standards based on 2008 ASHRAE 170 and to change that takes an act of Congress. Mr. Mason also pointed out that in talking about ventilation being an energy consumer, the real energy consumer is the natural gas being spent on reheat; it's about a third of the energy cost for hospitals in California. He promoted looking at solar thermal for reheat, especially in terms of carbon in the atmosphere,

Mr. Diehl highlighted they are working on seven buildings for Takeda Pharmaceuticals currently. One of the major benefits from laboratories is when you reduce air change rates, reduce reheat because you're not over-cooling the spaces, you're not providing 55-degree air to space and six air change rates and then having to heat it to maintain temperature. Many of the projects almost eliminate reheat by eliminating lowering air change rates and dynamically controlling it. As customers look to provide building a net-zero, many customers are going to go to electric heat sources, which has other design considerations.

Mr. Diehl disclosed that Aircuity is doing seven buildings for a pharmaceutical company and one of the major benefits of laboratories is that when air changes are reduced, so is reheat. In some cases, customers say they're okay to use more energy if it is clean energy and one of the quickest ways to reduce carbon is to eliminate reheat. He cited that customers are now allocating millions of dollars to turn their facilities to net zero and Aircuity was successful in these seven buildings by demonstrating to them where to eliminate reheat and how much carbon they could reduce.

Ms. Lampshire commented that because a big focus in healthcare is exposure, including to healthcare employees, facilities must answer to CalOSHA regarding the adequacy of air exchanges, and asked if the system provide a printout of the number of air exchanges in any given point in time. Mr. Diehl responded that the system monitors the ventilation and air change rates on every space individually and whole buildings. He explained that rooms are mapped into a software platform and air samples are pulled and monitored from that platform and the data is archived for perpetuity in the cloud, so one can see what is happening from a phone, iPad, or facility management system, in any given space at any time.

Bruce Rainey asked about the challenges of this technology in existing facilities versus new buildings. Mr. Diehl responded that more than half of their business is retrofitting existing spaces. The system and the technology deploy into both roughly the same.

Louise Belair asked how sensitive the sensors are and how much build-up does there need to be in a space before there is a measurement, and if the suggestion is to reduce air changes as a benefit, how do mitigate the risk of exposure. Mr. Diehl responded that measurements in the return air duct depend on reasonable mixing in the space. Aircuity takes the air sample and measure all five parameters using WHO guidelines for when to effectively increase ventilation. He went on to explain that increases in the air change rates in that space helps clean out that system, and as the measurement begins to clean and drop, the ventilation is decreased.

Ms. Belair followed up by asking how the five different parameters are established. Mr. Diehl stated that Aircuity leans towards safety and health over efficiency and that air change rates are increased at a very low level based on the guidelines of science and the understanding that the system is customizable.

Dr. Bliss stated that he liked the concept of moving from empiricism to measured responses because many of the standards employed in the built environment were generated by suppositions that weren't necessarily validated by good data. When real-time data can be pulled for better outcomes has a lot of potential for value, because the ability to infection control with air exchanges may be overestimated. Mr. Diehl cited that many customers are operating their laboratories at a two air change rate with dynamic control have broken misconceptions of what a clean space looks like. He disclosed that Aircuity has been able to show that clean rooms that previously operated at 50 or 25 air change rates, can operate at 10 and 8 and be as effective and clean. Mr. Diehl added that he believes it will take a data-driven approach to finally figure out what the right solutions are, along with better mixing or ventilation effectiveness in isolation suites and ORs.

Ms. Belair asked if any the systems have ever revealed the need for higher ventilation rates or dilution. Mr. Diehl replied that he had many examples of the system data highlighting issues and concerns that people were unaware of, including a university whose outdoor intake was next to a loading dock which was bringing in diesel fumes, and CO2 leaks in hospitals. He added that the University of Pennsylvania considers this an environmental health and safety system that saves the university tremendous energy.

Scott Jackson stated that when the Aircuity system was proposed to UCI, he looked at it with a fire and life safety and an environmental safety perspective. It took a concerted effort from environmental safety directors, industrial hygienists, radiation safety officers, facilities managers, and professors and was developed with the State Fire Marshal. He detailed that many were uneasy because they were being asked to do something nobody had ever thought of doing before. Five years later, everyone was onboard, including the governor's office, because of the data produced at the stem cell building at UCI that was designed and built with the system. He noted that the older facilities had to be retrofitted. In closing, Mr. Jackson remarked that it was a UC community project, that took a concerted effort despite the many initial objections. There were a lot of resources in the UC system that were put together with the State Fire Marshal, to develop a way to incorporate these air changes, winning the University numerous energy efficiency prizes as well as safety awards.

Information item and Action Item

none.

3. Microgrid Task Force

Presenter: Jamie Schnick, HCAI

Discussion and public Input

John Griffiths commented he is involved in the Ontario project and learning a lot and asked if there was a way to share the information with the greater community in order to avoid these common challenges. Mr. Schnick indicated that he could work with the Building Standards Unit and see if there is a way to share this information. He mentioned that he had a couple of presentations to the design and engineering community that a list can be put together to help get the first on get off the ground and publish that.

Mr. Griffiths shared that he did a presentation in Marin discussing decarbonization and microgrids, and he thinks there is a general lack of awareness in the community of the benefits of renewable power and microgrids. He asked how to reach decision-makers to help bring about more of these types of projects. Mr. Schnick stated that is the function of the task force and that they are doing everything they can to reach the public but that it is hard to reach those who could benefit most from the information.

Mr. Tokas added that HCAI's first step is presenting processes to the Board because that is where they receive the feedback that helps refine the policies, methods, procedures, and all the information that they share with the public, so this is essentially the "first step."

Eric Johnson asked how licensing was coming along with all of this new information and processes. Mr. Schnick stated that he could only speak on CMS, the Federal Program that reimburses for Medicare and Medicaid. He said that the biggest challenge was that CMS adopted an older version of NFPA 110 that only recognizes emergency generators as a source, and the way to get them to adopt a portion of a newer version, which would allow for other emergency sources besides generators, is first to get the model code, NFPA 170. Mr. Schnick continued, that in the past, CMS has been open to the idea of modifications by pulling excerpts

of approved codes from a future version of the codes they are enforcing. Therefore, the first step is to get the new codes to recognize microgrids and these clean resources as viable sources for emergency power. He stated that the goal is to keep the communication line open, so that when code does recognize other sources for emergency power, HCAI could go back to ask CMS if we could implement it. Mr. Schnick added that the discussion is taking place, but HCAI can't get CMS to sign off on a code that doesn't exist yet.

Nanci Timmins reported that as far as licensing, HCAI is in communication but is uncertain that they know the details regarding the pilot projects that are in place right now. Because these projects still use generators for emergency power, the alternate power system is tertiary, therefore requirements are still being met with the projects seen so far.

Mr. Vernon commented that because the microgrids are in parallel with the diesel and not trying to act in place of the diesel, he doesn't think CMS will have any trouble at all. He then shared with the Committee that the Department of Health and Human Services has created a new Office of Climate Change and Health Equity that would use all statutory authority to start to bend the country's climate curve. One thing that the National Academy of Medicine is encouraging is that CMS begin to adopt the most recently issued versions of the standards they enforce, because the most recent version of NFPA standards already recognizes microgrids and fuel cells for emergency power. Mr. Vernon also disclosed that the next NFPA codes are going to require that the essential system have a minimum of two sources: one source has to be on-site and sized to serve the essential system, and the other source can be either on- or off-site.

Mr. Griffiths asked for the definition of a clean power source that is written in the proposed code. Mr. Schnick replied that clean power sources include fuel cells, photovoltaics, energy storage, and geothermal. Mr. Griffiths added that someone might propose a bio-diesel generator as a clean power source for a microgrid. Mr. Vernon commented that the issue surrounding "what is a microgrid" is part of the reason that NFPA is getting rid of the term microgrid and are instead talking about sources and sets of sources. Because, in any practical microgrid, he stated that it is likely to include some amount of diesel generation capacity, coupled with other alternate sources, so NFPA will instead be requiring any two power sources whose reliability are sufficient to serve the essential loads.

Information item and Action Item

- None

4. Macro-Eyes, Inc.'s STRIATA: Artificial Intelligence (AI) for enterprise supply chain

Presenter: Jeni Stockman, Micro-Eyes, Inc.

Discussion and public Input

Dr. Bliss asked if Macro-Eyes validates the AI as it improves modeling of rooftop imagery and how does it close the loop and make sure that it is accurate. Ms. Stockman responded it's very rare that predictions are 100% accurate, that's why they speak to them as predictions. She said that they measure against a baseline of what is known previously to what can be predicted, so

when talking about fraction errors in terms of confidence intervals and validating the data itself, they don't talk about accuracy. Ms. Stockman explained that the way it is validated is through labeled data to have a set of true data that is known to be factual and that in some instances, that can be data collection that has already happened, or through a phone app that Macro-Eyes created that allows you to take a picture of a quantity and it calculates it much quicker than a human could. She cited that itself becomes valid labeled data, which can be leveraged to other equivalents, similar sites, to validate the predictions that we may have made on those sites. Ms. Stockman noted that it is all about leveraging, learning, and listening to the data, but to always benchmark it against what was known previously to understand accuracy and performance.

Information item and Action Item

- None

5. Comments from the Public/Board Members on Issues Not on This Agenda.

- None.

6. Adjournment

Mr. Lopez adjourned the meeting at approximately 12:02 p.m.