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# ASHRAE THAILAND CHAPTER

## President Message Newsletter #1 – 2020-2021

### เรียน ท่านสมาชิก ASHRAE ประเทศไทย และเพื่อนๆ ทุกคน

วารสารฉบับนี้ เป็นฉบับที่หนึ่ง สำหรับวารสารทำงานของ ASHRAE 2020-2021 ครับ ณ ขณะนี้ สถานการณ์โควิดในบ้านเราก็นับวันก็ดีขึ้นเรื่อยๆ แต่ในต่างประเทศ ก็มีข่าวการระบาดระลอกที่สอง ที่สาม ในอีกหลายๆ ประเทศ เรื่องนี้จึงเป็นเรื่องที่สำคัญ ถึงแม้ว่าประเทศไทยของเรายังไม่ประสบปัญหาเหมือนดังหลายๆ ประเทศ แต่เราเองก็ต้องเตรียมตัวและเตรียมความพร้อมในเรื่องนี้เอาไว้ตั้งแต่เนิ่นๆ



แม้กระทั่ง สำนักงานใหญ่ ของ ASHRAE เองก็มีมาตรการและวิธีการในการรับมือกับโควิด ซึ่งสามารถ ดูรายละเอียดเพิ่มเติมได้ในวารสารฉบับนี้ เพราะว่าเราจะสามารถหียบแนวคิด หรือ วิธีการ นำไปประยุกต์ใช้กับ โครงการของพวกเขาได้

ผลกระทบของโควิด ส่งผลกระทบเป็นวงกว้าง มีผลต่อสภาพความเป็นอยู่ เศรษฐกิจ อาชีพ และ สังคมเป็นอย่างมาก สำหรับ วิศวกรอย่างเรา การพัฒนาตนเอง เพื่อเตรียมความพร้อม และเพื่อรับมือกับการเปลี่ยนแปลงจึงเป็นเรื่องที่ละเอียดอีกต่อไปไม่ได้แล้ว พวกเราจำเป็นต้องติดอาวุธกับความรู้ใหม่ๆ ซึ่งทาง ASHRAE Learning Institute (ALI) ก็มีหลายเรื่องที่น่าสนใจ และ ตอนนี้ ALI กำลังเปิดคอร์สเรียนออนไลน์ ทางด้านการออกแบบวิศวกรรมที่มีประสิทธิภาพและปลอดภัยในช่วงฤดูใบไม้ร่วง รายละเอียดเพิ่มเติม : <https://www.ashrae.org/professional-development>

เรื่อง งาน AHR Expo จากเดิมที่กำหนดเอาไว้ในวันที่ 25-27 เดือนมกราคม 2021 ณ ตอนนี้ ทาง ASHRAE ร่วมกับผู้จัดงาน ได้ตัดสินใจให้ยกเลิกไปแล้ว โดยให้เลื่อนไปจัดในปี 2022 แทน

นอกจากนี้วารสารฉบับนี้ ยังมีเรื่องราวที่น่าสนใจอีกหลายเรื่อง อาทิเช่น

- เรื่อง Magnetocaloric Effect ซึ่งใช้สนามแม่เหล็กไฟฟ้าในการทำความเย็น
- เรื่อง วัสดุผนังอาคารที่จะช่วยลดคลื่นความร้อนที่รุนแรงในช่วงหน้าร้อนให้อยู่ในระดับที่พอทนได้
- เรื่อง แนวทางใหม่ในการลดปริมาณ CO<sub>2</sub> จากห้อง data center และ ห้อง Server
- เรื่อง การพัฒนาระบบทำความเย็นสำหรับ data center โดยใช้สารทำความเย็น ความดันต่ำตัวใหม่

สุดท้ายนี้ ขอให้ทุกท่าน รักษาสุขภาพ และ ติดตามความคืบหน้าของสถานการณ์โควิดเป็นระยะ จนกว่าทุกอย่างจะคลี่คลาย ด้วยความปรารถนาดี จาก ASHRAE THAILAND CHAPTER

ขอแสดงความนับถือ

ท่านสามารถติดตามข่าวสาร ASHRAE Thailand chapter จะมีการจัดกิจกรรมต่างๆ ได้ที่



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President 2020-2021 ASHRAE Thailand Chapter

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## The Magnetocaloric Effect

Magnetic air conditioners are based on a phenomenon known as the magnetocaloric effect. Magnetic materials heat up when they are exposed to a magnetic field, then cool down when the field is removed. The magnetocaloric effect was first observed in iron samples by a German physicist named Emil Warburg in 1881, but the change in temperature was too small for any practical application. In recent years, however, separate groups of researchers have developed magnetocaloric metal alloys that produce a significantly larger magnetocaloric effect at room temperature.

### How will magnetic air conditioners work?

Magnetic air conditioners cool the air by quickly and repeatedly exposing a magnetocaloric material to a magnetic field. In one prototype designed by Astronautics Corporation of America in conjunction with the U.S. DOE's Ames (Iowa) Laboratory, a wheel containing the rare-Earth element gadolinium spins through the field of a stationary magnet. As the disk spins, the gadolinium alloy heats up, then cools as it passes through a gap in the field, cooling the water that surrounds it as it makes its trip.

### Environmentally Friendly Technology

In a magnetic air conditioner, the alloy acts as the "refrigerant," and plain old water provides the heat transfer, eliminating the need for the decidedly unfriendly hydrochlorofluorocarbons (HCFCs) used in traditional air conditioners. While the earliest magnetocaloric alloys were either toxic or prohibitively expensive, the latest magnetocaloric materials are cost-effective and environmentally safe.

Magnetic air conditioners do require electricity, but the motor that spins the disk containing the magnetocaloric alloy is expected to be much more efficient than the compressor required to run a traditional air conditioner. According to a 2011 article in Scientific American, Astronautics hopes to have a prototype by 2013 that uses just two-thirds as much electricity as a conventional air conditioner to provide the same amount of cooling.

### Is there a magnetic air conditioner in your future?

In addition to the researchers mentioned above (Astronautics and DOE), several private companies, universities and government agencies around the world are exploring magnetic cooling technology for industrial and domestic applications including air conditioning, refrigeration and climate control.

The National Laboratory for Sustainable Energy at the Technical University of Denmark runs its own "MagCool" project, while research at Penn State and other U.S. universities has advanced the understanding of magnetocaloric principles, helping us understand why one material might cool more efficiently than another. In 2009, BASF and Delta Electronics announced a corporate partnership to develop new magnetocaloric cooling systems and "explore the opportunities of magnetocaloric power generation." But as much as we'd love to get our hands on this new technology today, commercial availability of magnetic air conditioners is still at least a few years away, and the first uses will most likely be industrial rather than residential.

## Building walls that will make summer heat waves more bearable

*new way to reduce heat penetration through building walls. Application of a phase change material and bubble injections to building walls.*

### NATIONAL RESEARCH COUNCIL OF SCIENCE & TECHNOLOGY

With the summer heat becoming increasingly unbearable and prolonged over the years due to climate change, the cooling load in the summertime has also been on the rise. Insulation is currently the primary solution for blocking heat from entering a building, but by applying an additional material that can delay heat penetration, it can suppress the indoor temperature from rising and in turn lower the cooling load of the building.

A research team in Korea has developed a new material for buildings walls that can help reduce the penetration of heat from the outside. The team directed by Dr. Sang Woo Karng from the National Research Agenda Division of the Korea Institute of Science and Technology (KIST) revealed that they have successfully lowered heat penetration through building walls by applying a phase change material (PCM).

### IMAGE: (A) PCM WALL CROSS SECTION (B) TEMPERATURE MEASUREMENT POSITION

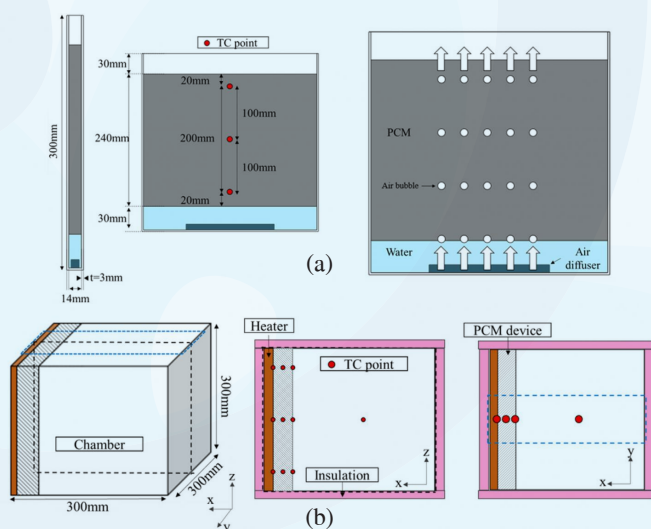
*CREDIT: KOREA INSTITUTE OF SCIENCE AND TECHNOLOGY (KIST)*

PCMs refer to materials that absorb or release heat from/to the surrounding area but does not change temperature during phase change. One of the most common types is paraffin oil, which is used to make candles. A solid PCM absorbs heat as it transitions into liquid phase, so by using a case to hold it when it is in liquid phase without causing any leakage, it is possible to apply them to a building wall to block heat from entering inside.

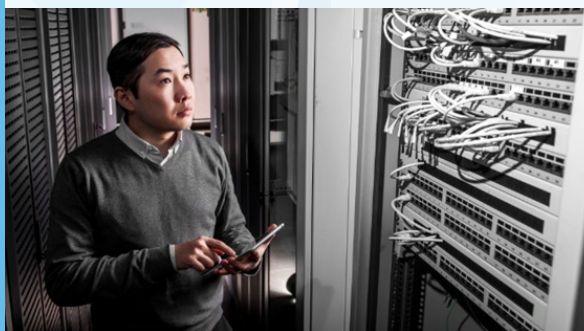
The problem is, however, PCMs do not melt evenly from the outside toward the inside during phase transition from solid to liquid. To be more specific, PCMs turn into liquid starting from the outermost layer, and the parts that are hot move upward, while the parts that are still relatively cool move downward. Thus, while the upper part may have completely melted, the lower part will have not, and as a result, heat will penetrate into the building through the area where the PCM is in liquid phase. Ultimately, the PCM becomes ineffective in controlling the indoor temperature and is rendered useless.

Dr. Karng's team addressed the non-uniform phase change with bubble injections. By injecting bubbles into bottom part of the PCM during phase transition enabled uniform circulation of the PCM in liquid phase. As a result, the PCM melted from the area closest to the envelope in a uniform manner, and heat penetration was inhibited across the building wall until the entire PCM melted.

Dr. Karng said, "We expect that the insulating wall using the PCM bubble generator used in this study will contribute to reducing the amount of energy used to heat or cool a building. Insulation techniques using PCMs helps reduce heat penetration, in combination with the building insulating material, and it can also be used as the outer walls of zero-energy buildings."



## New solution for reducing CO<sub>2</sub> from data centres and server rooms



Researchers at DTU will work with industrial companies to develop a new cooling and storage system for data centres and server rooms, which will be managed through artificial intelligence and reduce energy consumption and thus CO<sub>2</sub> emissions.

Data centres and server rooms use electricity to operate their IT equipment and cool their servers. One large data centre alone can consume electricity corresponding to up to four percent of the total Danish electricity consumption, and that figure is expected to increase significantly as our internet consumption increases and creates the need for even more data centres (source: Danish Council on Climate Change). The electricity consumed by cooling data centres and server rooms is actually expected to increase so much that it will be difficult to cover with renewable energy. In addition, the excess heat from the servers is not being used at all, which is a must if we are to increase energy efficiency.

For these reasons, researchers at DTU Compute, DTU Civil Engineering and DTU Management have joined forces with industrial companies in a project to develop a new technical and flexible energy solution that can improve energy efficiency in data centres and server rooms by up to 80 per cent.

An important element of this work is the selection and test of phase-change materials (PCMs), which are used, for example, to regulate the temperature in buildings. The researchers will develop a cold storage based on PCMs that can be used to cool the server rooms, and at the same time is using renewable energy and is integrated with the district-heating network to make use of waste heat and thereby reduce CO<sub>2</sub> emissions in the digital sector.

The project, called 'Cool Data,' is a Grand Solution project supported by Innovation Fund Denmark with DKK 13 million.

"The goal is to develop a flexible thermal cooling and storage system that can store renewable energy from wind turbines and solar cells when there is a surplus of it, and use this energy in the cooling process. At the same time, the system must also be able to send the excess heat from the cooling of the servers to the district-heating network. This will create an energy system where, in future, data centres and server rooms will be fully integrated with both the electricity and district-heating systems," says Dominik Franjo Dominkovic, a postdoc at DTU Compute and project manager for the project.

### Focus on small and medium-sized data centres and server rooms

It is completely new technology that is being developed, which will be targeted at small and medium-sized data centres – that is, data centres with up to 500 servers.

"We've tended to focus solely on the energy consumption of large data centres here in Europe, but studies from the US show that small and medium-sized data centres make even worse use of energy. In fact, they consume between a third and half of all the energy that goes to data centres, and when you consider how many industries have server rooms, this is an important area in which to improve energy efficiency," Dominik elaborates.

### Solution to be tested in companies

The new solution requires the development of hardware in the form of the smart energy storage and cooling system. It also involves developing a smart software controller which, using artificial intelligence, will control the actual storage of energy, the cooling process and the use of waste heat, thus ensuring optimal use of energy. The integrated cooling and storage system is to be supplied with energy from various renewable energy systems.

"Once we've developed the software and the cooling and storage system, which we expect to be state of the art, we'll implement the solution and test it at one of the project's participating district-heating companies, so we know that the connection to the district-heating network works and the surplus heat is utilized there. We're also testing the solution at an airline company," says Dominik, who expects the test run to be completed in 2023.

The researchers will also calculate the climate and financial benefits the system will produce, as the goal is to develop the solution on a large scale.

"There's no doubt that the new flexible cooling and storage system will be able to contribute to the achievement of Denmark's climate goals. We will therefore also analyse how much we can reduce CO<sub>2</sub> emissions, how we can extend the solution to all industries with server rooms that need to be cooled, and where the excess heat can be utilized in the district-heating network," says Claire Bergaentzlé, assistant professor in DTU Management, who leads the financial and climate calculations.

## NEC, NTT develop data center cooling system using new low pressure refrigerant

### R1224yd could be a name to conjure with...

By Tanwen Dawn-Hiscox Peter Judge

Japanese technology companies NEC and NTT Communications have teamed up to engineer a system to cool data centers using less energy than any other, using a new low pressure refrigerant.

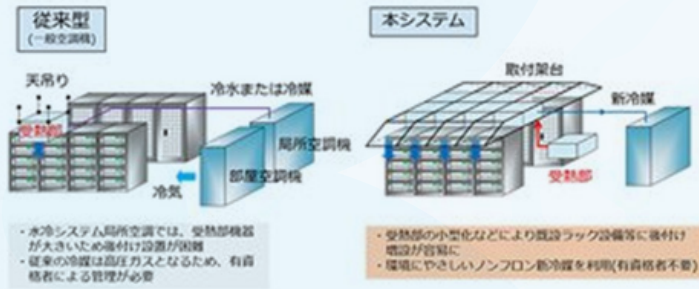
The cooling liquid R1224yd, was created and manufactured by Japanese refrigerant company AGC Asahi Glass, and is an A1 non-flammable hydrofluoroolefin (HFO) refrigerant, considered more environmentally friendly than more commonly-used potent greenhouse gases known as hydrofluorocarbons (HFCs), according to Cooling Post.

R1224yd was originally designed for use in centrifugal chillers, and has also been proposed as a working fluid in heat recovery systems generating power from waste heat.

### Easy to retrofit

"This system will contribute to the reduction of power consumption and global environmental load by putting a new refrigerant (non-CFC) into practical use for the first time in the world as an air-conditioning system and having a structure that can be easily installed on existing floors, server rooms," according to a joint press release issued by NEC and NTT last week (Google translation). "It will be the first time in the world to put an air-cooled air conditioner system using the new refrigerant (R1224yd) into practical use, reducing power consumption and realizing a global environment-friendly cooling system."





As local air conditioning for floors with low ceilings, it is easy to retrofit to existing buildings and equipment.”

### Low greenhouse effect

NEC said that R1224yd would improve the cooling efficiency of servers, and also reduce air conditioning power use by 50 percent compared with conventional cooling systems. Total data center power use was cut by 20 percent, as demonstrated during a trial in a data center in India.

R1224yd was first listed and approved by ASHRAE in October 2017, and its potential for data centers was quickly realized. In 2018, NEC posted a release promising “a heat removal technology with vapor-compression that uses low-pressure refrigerant” which it aimed to commercialize by 2020. With this announcement, that seems to have come to pass.

Initially, the new cooling systems will be placed in NTT data centers, but by 2022 the pair are hoping to scale up production and sell them to customers with large-scale cooling needs, including those dealing in communications equipment.

The companies claim that the system is easy to retrofit to existing facilities. This is because they have put the low pressure coolant into a phase-change system with a high-performance heat absorption component - this means a small size system which can be easily built into existing facilities: “The size of the heat receiving part has been reduced (height about half that of conventional products).

The breakthrough is having a refrigerant which has a low global warming potential (GWP), but which still performs well in cooling systems. Traditional refrigerants such as chlorofluorocarbons (CFCs) and hydrofluorocarbons (HFCs) are highly potent, with a GWP thousands of times bigger than CO<sub>2</sub>, the most widespread and best-known greenhouse gas. They also remain in the atmosphere for decades.

Authorities including the EU have ruled that CFCs and HFCs must be phased out, but till now their replacements have been worse at the job of cooling. They have also been more unstable, to ensure they don’t remain in the atmosphere - which means some are a fire risk.

R1224yd is a hydrofluoroolefin (HFO), a class of compound which has a GWP around the same as CO<sub>2</sub>, but with good refrigerant performance and stability. HFOs are regarded as a “fourth generation” refrigerant, with less than 0.1 percent of the GWP of hydrofluorocarbons (HFCs).



## Chicago 2021 is Cancelled; Looking ahead to the 2022 AHR Expo in Las Vegas

After exhausting all possibilities to tentatively reschedule the Show for March 2021, we regret to announce today the forced cancellation of the 2021 AHR Expo in Chicago. With roadblocks set in place by the ongoing COVID-19 pandemic and resulting current state and local restrictions that prohibit mass gatherings over 50 people, an in-person event will not take place in 2021. Instead, we’ll shift our focus to 2022 and prepare for an in-person event in Las Vegas, NV.

We know how much the HVACR community looks to AHR Expo to kick off the year’s business momentum, launch never-before-seen new products and services, and to secure valuable networking contacts for the year ahead. We believe in the value of an in-person event experience as an important means to discover, explore, develop and advance the HVACR industry together as a community.

With this in mind, we now turn our attention to welcoming you in Las Vegas January 31<sup>st</sup> - February 2<sup>nd</sup> for the 2022 AHR Expo. We eagerly look forward to hosting you once again for the in-person experience you’ve come to expect -- three days of networking, access to HVACR’s top suppliers and distributors, a floor packed with exhibitors and exciting new products and services, an education program hosted by our industry associations and the overall energizing visit with the entire HVACR community we are accustomed to.

We want to extend our sincere thanks for the support and dedication of so many industry members eager to participate.

# ASHRAE's Global HQ is Moving!

Your new ASHRAE Headquarters is nearing completion and we are about to move in! Starting **October 7, 2020**, you can find ASHRAE's global HQ at **180 Technology Parkway, Peachtree Corners, GA 30092**. We hope to see you there in the future!



## Upcoming ALI Online Courses

ASHRAE Learning Institute (ALI) 2020 Fall Online Instructor-led Course Series provide engineers in consulting practices, facility management and other building professionals with instruction on applying ASHRAE standards and employing new technologies essential for advanced building performance.

New and updated courses include:

- ➔ Laboratory Exhaust Stacks: Safe and Energy Efficient Design | Dec. 3
- ➔ Successfully Managing the Risk of Legionellosis Using Standard 188-2018 | Dec. 8

The remaining course offerings are as follows:

- ➔ Guideline 36: Best in Class HVAC Control Sequences | Nov. 9
- ➔ Advanced Designs for Net Zero Buildings | Nov. 17
- ➔ Avoiding IAQ Problems | Dec. 15

# ASHRAE Headquarters

## Building Readiness Plan for SARS-CoV-2

BY WADE H. CONLAN, P.E., BCXP, MEMBER ASHRAE

The ASHRAE Epidemic Task Force (ETF) has quickly created a number of useful guidance documents for operating buildings during an epidemic, which are posted on ASHRAE's COVID-19 website pages ([www.ashrae.org/covid19](http://www.ashrae.org/covid19)). Many of these documents would also apply after the epidemic has passed. Since the existing ASHRAE Headquarters (HQ) was observing shelter-in-place orders to help flatten the transmission of the SARS-CoV-2 virus that causes COVID-19, the building was unoccupied for several weeks. The ETF believed, and ASHRAE leadership agreed, that the ASHRAE HQ should be evaluated using the same analysis approaches it is suggesting for its members and their clients.

Members of the Building Readiness Team that is part of the ETF performed the analysis on the current ASHRAE HQ to determine which mitigation strategies should be implemented prior to staff returning to the building. This team also looked at the new ASHRAE HQ under construction to determine if any engineering controls could be added to improve its ability to mitigate virus transmission in alignment with the Building Readiness Guide (<https://tinyurl.com/y5r92ohs>).

For the existing HQ building, a team of individuals was formed to perform the analysis that consisted of ETF members, the commissioning provider for the last renovation to the building and the building operations team for ASHRAE. (See "Analysis Team" on the facing page.)

The intent of the analysis was to review the HVAC systems and to identify potential improvements to the system and potential failure points that could be checked by the building's maintenance contractor. The team used the existing building automation system (BAS) graphics, as-built floor plans and BAS trend data to conduct this effort. The building has a dedicated outdoor air system (DOAS) that delivers all the outdoor air to the spaces. Local cooling and heating is provided using different terminal equipment on each floor: the first floor is conditioned using ground source heat pumps; and, the second floor is conditioned using variable refrigerant flow fan coil units. Each of the terminal units has a filter box to provide increased filtration capability in addition to the filtration incorporated into the DOAS unit. There is only one exhaust system for the building, and that is via the DOAS unit through the energy recovery wheel that is located on the roof.

The first step in this effort was to identify potential issues for the HVAC systems maintenance contractor to check on their next visit to the building. Then the team tried to identify improvements that might need to be implemented. ASHRAE staff wanted a list of things for the maintenance contractor to check in addition to the normal quarterly checkup.

The first issue identified was to confirm the status of the filters in the DOAS and at each of the filter mixing boxes at the terminal equipment in the spaces. ASHRAE staff was able to confirm that the interior electrostatic filters had been replaced around the time of the 2019 Winter Conference in Atlanta and were still within useful life. These electrostatic filters allow the terminal equipment to achieve MERV 13 filter performance.

There are two sets of filters in the DOAS. One set of supply filters is installed after the return bypass and energy wheel that are MERV 13 equivalent, which reduced concern over potential wheel crossover or return path leakage. To be safe, it was suggested that the maintenance team disconnect or disable the return damper and seal that pathway to further mitigate potential transmission by having the unit function with 100% outdoor air and 100% exhaust air.

The second set of filters was on the building return/relief to the unit prior to the energy wheel. These filters need to be confirmed to be MERV 8 as originally required in the design, which was based on having MERV 13 filters before the air is supplied to the space.

There was an extended discussion on the operation of the DOAS unit and its capacity to bring in outdoor air during the occupied times as well as provide for pre- and post-occupancy flush cycles. The team agreed to a sequence to keep the unit at its maximum outdoor airflow setpoint during occupied modes and then to perform the analysis recommended in the Building Readiness Guide to determine the number of hours required for these flush cycles. The Building Readiness Guide suggests three air changes of outdoor air to flush the building of approximately 95% of its contaminants. Quick calculations showed that this would require three hours of flushing and was noted that this should be added to the BAS schedule programming.

To maximize the ventilation airflow to the space during occupied hours, the demand controlled ventilation was to be "disabled" for the system. The team agreed that changing the space CO<sub>2</sub> set point to 300 ppm would effectively "disable" the demand control ventilation (DCV) sequence and allow for minimal programming time now and when it is time to re-enable this energy savings strategy post pandemic.

The BAS also monitors building pressure via sensors located throughout the building. The team agreed it was appropriate to have the maintenance contractor's testing, adjusting and balancing (TAB) personnel check the calibration of these sensors to verify the system was working properly.

Other strategies HQ will be using that are not HVAC related include staggering employees' workdays and areas to create separation and reduce occupancy, improved cleaning processes and frequency, minimizing elevator use and limiting conference room occupancy and use.

For the new ASHRAE HQ under construction, the team met with the project oversight committee lead, Ginger Scoggins, P.E., Fellow ASHRAE, to review the systems' design and capabilities. This building will also be using a DOAS system equipped with MERV 14 filters, ultraviolet germicidal irradiation (UVGI) sized at a lamp intensity to provide for a kill strength using a single pass and energy wheels located relative to the fans to minimize any cross contamination.

The contract documents require a pressure profile be completed during TAB to verify compliance with the performance levels outlined in ASHRAE's "Practical Guidance for Epidemic Operation of Energy Recovery Ventilation Systems" (<https://tinyurl.com/y2wyth7o>). Zone/space airflow is controlled via air terminal equipment that will use the same space CO<sub>2</sub> ppm adjustment discussed for the existing HQ to temporarily disable the DCV strategy. The team analyzing the systems felt that the design of the new facility had incorporated many of suggested mitigation strategies and did not need further alterations to align with the ETF guidance.

Thanks to the ASHRAE Epidemic Task Force for creating the guidance, as well to as the individuals that led the effort to analyze the existing and new ASHRAE buildings

### Analysis Team

Wade Conlan, P.E., Member ASHRAE, Hanson Professional Services, Inc.

Dennis Knight, P.E., Fellow ASHRAE, Whole Building Systems

Justin Garner, P.E., Member ASHRAE, Engineered Air Balance Co., Inc.

Jay Sheppard, Associate Member ASHRAE, Atlantic Testing

Jason DeGraw, Ph.D., Member ASHRAE, Oak Ridge National Lab

Rick Hermans, P.E., Life Member ASHRAE, Retired

Jay Enck, Member ASHRAE, Commissioning & Green Building Solutions, Inc.

Ginger Scoggins, P.E., Fellow ASHRAE, Engineered Designs, Inc.

Mike Vaughn, ASHRAE Staff

Jeff Littleton, ASHRAE Staff

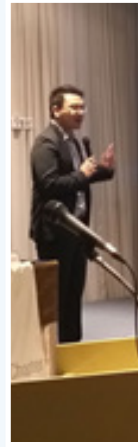


# กิจกรรมของ chapter ในวาระ 2019-20

การจัด Dinner Talk วันอังคารที่ 24 กันยายน 2562 หัวข้อ “ASHRAE President’s Past Experiences on Energy Efficiency” วิทยากรคือ Mr. Darryl K. Boyce



สัมมนาวิชาการครั้งที่ 2 หัวข้อ “การใช้ระบบ IOT และ เครื่องมือการวินิจฉัยเพื่อการประหยัดพลังงานระบบปรับอากาศแบบчилเลอร์” วันที่ 22 กันยายน 2563 ณ ห้อง อินทานิน ชั้น 3 โรงแรมสวิสโฮเทล ถนนรัชดาภิเษก โดยมีวิทยากร คือ ผศ.ดร. เด่นชัย วรเดชจำเริญ ดร. พุทธิพงษ์ มหาสุคนธ์ และ คุณ สมเกียรติ โสหะสาบ จากทีมวิจัย IBC



การจัดสัมมนาครั้งที่ 1 หัวข้อ “มาตรฐานและการนำเทคโนโลยี มาวิเคราะห์สภาวะอากาศใน healthy building” วันพุธที่ 26 กุมภาพันธ์ 2563 โดยวิทยากรคือ รศ.ดร. พันธุดา พุทธิไพโรจน์, ผศ.ดร. ตฤย์ มณีวัฒนา และ ศ. จิรติพัฒน์ ประทานทรัพย์



การจัดสัมมนาครั้งที่ 3 Virtual Webinar ร่วมกับ Malaysia และ Singapore Chapter วันที่ 3 ตุลาคม 2020 หัวข้อ “Humidity Control with and without reheat” โดยมี วิทยากร คือ Thomas Durkin ผ่าน Zoom application

การจัด webinar ผ่าน zoom application ในหัวข้อ “ASHRAE Guidance on Commercial Building in the Pandemic & Latest Researches on Covid-19 Infectio Risk in HVAC” ร่วมกับ SCG วันอังคารที่ 2 มิถุนายน 2563 เวลา 19:00-20:00 น. โดยวิทยากรคือ Dr. Marwa Zaatari, Member of ASHRAE Epidemic Task Force in Commercial & Retail team, Member of LEED Committee และ Dr. Israel Biran, Biotechnology Expert

การจัด virtual dialogue session กับ ASHRAE Society President, Mr. Charles Gulledge. ในวันที่ 5 ตุลาคม ร่วมกับ Philippines chapter, Malaysia chapter และ Indonesia chapter เพื่อทำความรู้จักและพูดคุยเกี่ยวกับกิจกรรมของ chapter รวมทั้งรับทราบนโยบายของ ASHRAE ในปีนี้



การเยี่ยมชมดูงานห้องทดสอบ Appliance and HVAC/R Solutions ของ Underwriters Laboratories ประเทศไทย วันพฤหัสบดี ที่ 8 ตุลาคม พ.ศ. 2563



การประชุม Regional Planning 2 Virtual Meeting ร่วมกับ chapter อื่น 9 chapter ใน region 13 วันที่ 6 มิถุนายน 2020 ผ่าน Gotomeeting application



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