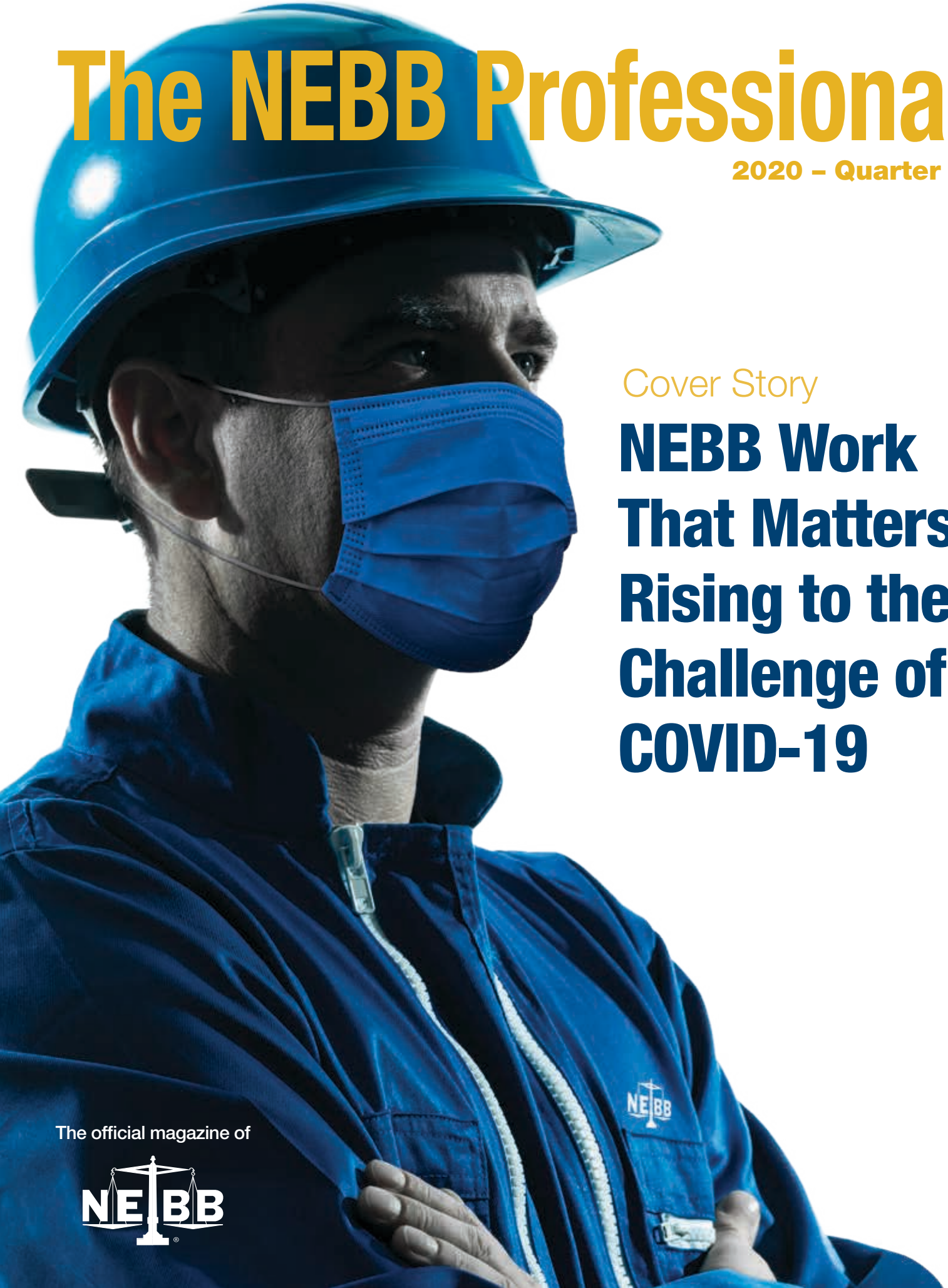
The NEBB Professional

2020 – Quarter 3



Cover Story

NEBB Work That Matters: Rising to the Challenge of COVID-19

The official magazine of

NEBB

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Add your experiences to our archives. Send your submissions to Tiffany Suite, EVP at tiffany@nebb.org

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Quarter 3 – 2020

The NEBB Professional is a quarterly magazine published by NEBB. 8575 Grovemont Circle, Gaithersburg, MD 20877 Tel: 301.977.3698 | Email: communications@nebb.org

Features

NEBB President's Message

The pandemic has caused NEBB to make some changes...

Oh what a year 2020 has been! I don't have to tell you this, because we have all been experiencing it together. I hope everybody in our NEBB family has been able to stay safe throughout the past few months and continue to stay safe until we get this pandemic under better control. We encourage you to follow your job site, local, state and federal guidelines to help prevent and reduce transmission.

You already know, the pandemic has caused NEBB to make some changes on how we normally operate. In order to assure everyone stays safe, we have canceled all of the remaining Technical Seminars through the end of 2020. In addition, NEBB leadership has waived the Chapter requirement to hold a recertification seminar, as well as waived the requirement that each Chapter shall ensure attendance at the Annual Conference and representation at the Chapter coordinators roundtable annual meeting.

For the 2021-2022 recertification cycles, the Certified Professionals CEC requirement for a two-year cycle has been lowered from 12 to 6 credits (minimum of 3 NEBB and up to 3 non-NEBB). The Certified Technician CEC requirement for a two-year cycle has been lowered from 6 to 3 credits (minimum of 1.5 NEBB and up to 1.5 non-NEBB). Also, due to travel constraints and concerns with COVID-19 ramping up, the Board of Directors has voted to reschedule the Annual Conference from August to November 17-19, 2020. Let's hope that we finally get this pandemic under control and will finally be able to hold the 2020 Conference!

NEBB staff has been doing a great job holding everything together during these trying times. Executive Vice President, Tiffany Suite, has been leading the charge effectively and efficiently as she always does. Always keeping NEBB's interests her number one priority. Cristi Arbuckle is the NEBB Exam Development Coordinator managing the individual candidacy process, handling exam grievances, and responsible for exam development. She also manages the subject matter experts, the development and maintenance of the body of knowledge. Sumayyah Milstein is the Firm Certification Coordinator. She manages firm certification, recertification and miscellaneous applications. She is the primary point of contact for Certelligence and the Quality Assurance Program. Sheila Simms is the Individual Certification Coordinator. She manages individual certification, recertification applications and also provides assistance with candidacy applications. Stephanie Brandt is the Manager of Finance. She is responsible for accounts payables and receivables as well as the financials and budgeting. Christina Spence is the Office and Scheduling

Coordinator. Christina manages technical seminars coordinating with the technical committees. She is responsible for the NEBB bookstore, provides office support and is the NEBB secretariat. It's great to see NEBB fully staffed and working together to provide support for our Board of Directors, Committees, Firms, Certified Professionals and Certified Technicians.

Please, be sure to follow your hometown's safety restrictions and be safe. Hopefully we will see you at the Greenbrier for the Annual Conference on November 17-19, 2020.

Take care,

Jeff

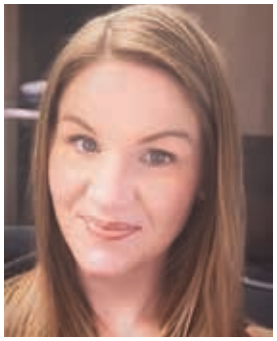
Jeff Schools
NEBB President

Tiffany Suite
Executive Vice President

Cristi Arbuckle
Exam Development Coordinator

Sumayyah Milstein
Firm Certification Coordinator

Sheila Simms
Individual Certification Coordinator



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Manager of Finance

Christina Spence
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Audrey Kearns — Editor
Kerri Souilliard — Staff Writer

A message from the editor

AUDREY KEARNS

How AreYou Surviving in Covid-19?

We are living in different times and a different world. Sometimes I think, will we ever go back to "normal" or will our new normal look different? Here in Northern California, we don't see an end to the changes we have had to make in our lives.

I am working out of my home like so many others. We see people thru their eyes as their faces are obscured by a mask. The common hand shake is gone, let alone the familiar hug hello. Yet, thru all these changes I still see hope in people, still see friendliness as we have all adjusted.

We have all been affected in our personal lives and in our businesses. There have been some great stories from firms helping to getting those essential services up and running as the need has been great to serve those who have been affected. Our NEBB Firms and NEBB professionals are out there working on essential buildings and projects, such as hospitals, isolation rooms and more.

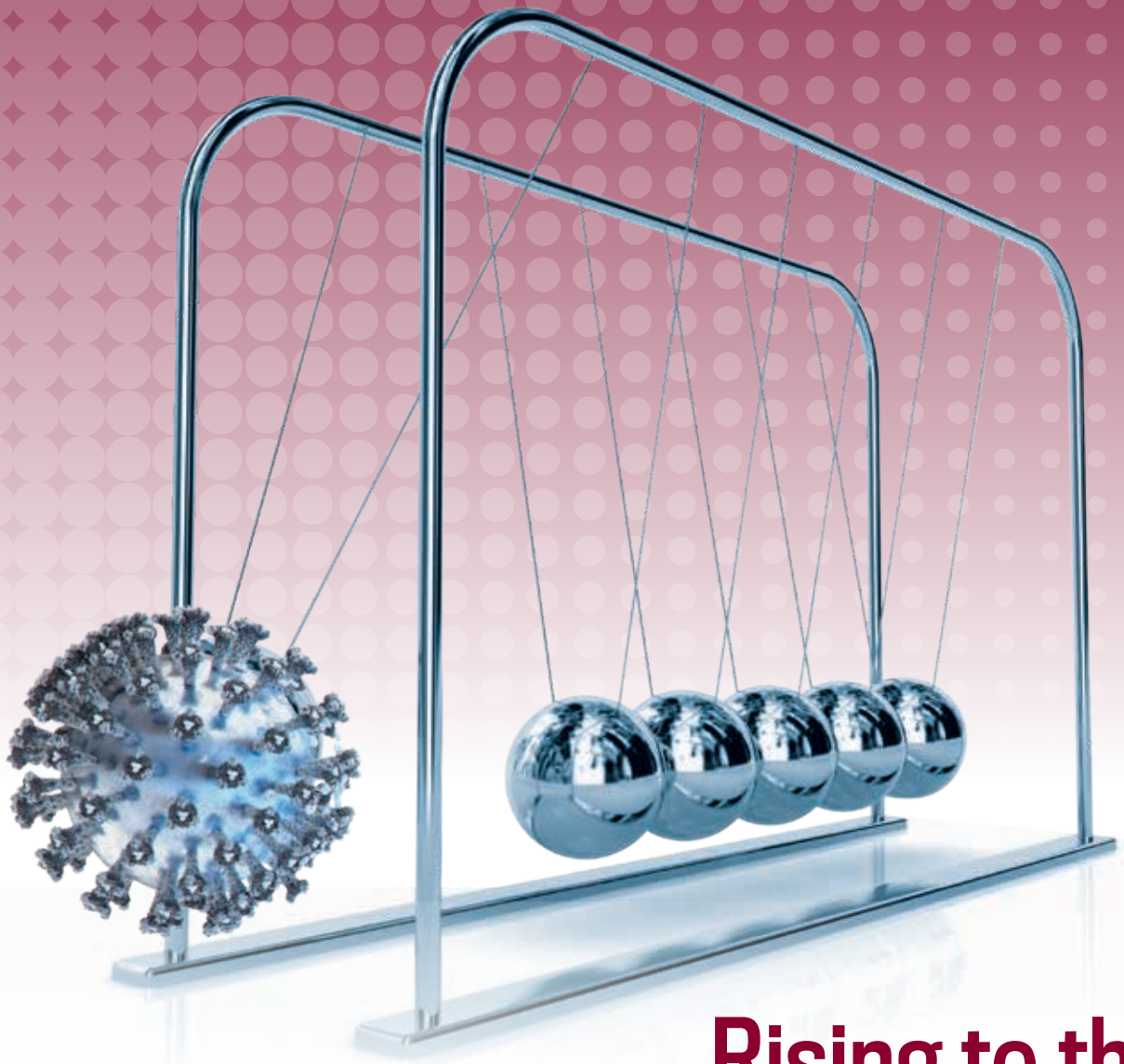
We asked you to share your stories and you came thru.

I hope you enjoy this edition of The NEBB Professional.

Stay safe, stay healthy!

Audrey Kearns

NEBB Work That Matters:



Rising to the Challenge of COVID-19

By: Kerri Souilliard

Although the novel coronavirus had already been spreading rapidly, most employees in the United States went to work in mid-March unaware that their lives were about to temporarily, yet drastically, change. When the number of known cases of COVID-19 rose to 1,645 across 47 states by March 12th, the US declared the crisis a national emergency the next day. With limited knowledge of what the virus was, and was capable of, few people guessed that a

regular day in March would turn out to be their last day at work—either physically for those fortunate enough to be able to work remotely, or employed altogether for the large percentage of the workforce that experienced layoffs.

For many NEBB experts, however, that was far from the case. Experts like NEBB Certified Professional (CP) Tony Kiefer, Test and Balance Foreman for Harris in Rochester, MN were preparing for the brutal effects of COVID-19 well before it became widespread in the US. By examining the havoc wreaked in China, and then in Europe, many knew that hospitals would need to be built out and interim critical care facilities needed to be ready to operate for further ICU capacity in just a few short weeks. Those select few that had been paying attention, knew it wasn't a matter of *if*, but *when*, the virus would inevitably take over the US.

Necessary COVID-19 Guidance

In early spring, NEBB 2019-2020 Vice President and President of Atlantic Testing Jon Sheppard was asked to join an ASHRAE subcommittee regarding the effects of the pandemic. After ASHRAE started seeing the coronavirus spike in other countries back in January, it put together an epidemic task force to help offer guidance. As part of the building readiness subcommittee, (which reports to the overarching epidemic task force committee), Sheppard uses his TAB and commissioning expertise to help answer questions submitted through the ASHRAE website.

"In this time of uncertainty, owners and operators need to know how to shut their building down if they've temporarily ceased operations, how to change the building status to accommodate a reduction in use, and how to prepare to properly get things back to normal—or more foreseeably, prepare for some kind of a 'new normal.' It's too early to pick out trends in our industry. It's too early to tell a lot of things, but personally, I'm expecting to see a new normal," says Sheppard.

Many of his clients, amongst others, have been relying on the ASHRAE website for guidance throughout their work to help contain COVID-19. Although no new standards have been developed specifically for this pandemic, ASHRAE is pointing users to existing standards and documentation for implementing methods to help keep building occupants safe. Based on questions submitted through the site, ASHRAE offers a list of online FAQs for topics like Healthcare, HVAC System Operation During Building Shutdown, How to Return the HVAC System to Normal Operation, and more. The website, which can be found at www.ashrae.org/covid19 is updated every week.

For his own firm, he's reviewing systems manuals, sequences of operation, and helping his clients with testing to establish benchmarks for things like airflow, sequences, humidity levels, and pressurization before any changes are made to their buildings. "It's important to test and make sure that the building is operating like the owner thinks it is," Sheppard says. "As you can imagine, our hospital clients have been the most proactive about this. Comfort level, humidities, airflow, fresh air rates are all taken into account."

Pivotal, Quick Turn Projects

Working with the Mayo Clinic, Kiefer entered the frontlines of pandemic projects early on. "We started around March 10th because they had been monitoring the international community and saw how quick it hit," Kiefer describes his experience of entering preparation mode early. "They wanted to have a plan in place for anticipated heavy patient loads."

At the Mayo Clinic, Kiefer's team was responsible for converting what would normally be positive patient rooms into negative rooms with dedicated exhaust. They altered over 100 rooms to meet the required number of air changes per MN health codes, as well as worked with the engineers at the clinic to set rooms to the calculated airflow for room size. "In some cases, we had two days to do balancing work. We worked alongside Mayo's engineers to make decisions like making adjustments if readings showed we were short on airflow," he says.

"One of our most interesting projects was to help design and plan for two 40 x 7-foot steel trailers to be used in sanitizing surgical masks for reuse. We found out about the project on a Friday afternoon and needed to have it operational by Monday morning for a test run. And we had to come up with fans and dampers that were readily available at the Mayo Warehouse in order to meet the short time frame," explains Kiefer, referring to the exhaust dampers and fans used during the sanitization process that occurs in the trailers. "It's work that couldn't be done without two of my reliable coworkers—NEBB Certified Technician John McNeil and Cheri Spading who is about to take the TAB test."

Like Kiefer's work at Harris, many NEBB firms were used to finding out about a job, followed by a request for com-

pletion just days later. In the midst of a national outbreak, time is not on anyone's side. "Around late March, we started getting calls from local hospital clients. They needed isolation wings set up with negative pressure rooms and needed us to go in and verify air changes in the rooms. All our clients were calling with emergencies. We got calls at 9:00 p.m., 4:00 a.m., all hours of the day. They were in panic mode," recalls NEBB CP Nick Muscolino, Manager at Aero Building Solutions near Chicago. "They were reaching out to find out what their systems could handle, or what additional equipment could be applied to meet their new needs."

"We were selected by the Army Corps of Engineers to open two auxiliary care hospitals and not only set up the airflow, but also help the design team determine feasibility of the conversions. It was a unique situation, as the hospitals were shuttered and had not been in operation for at least a few years. No one knew what they were getting into. We didn't see drawings ahead of time; everyone was looking at them together, coming up with strategies, and walking the building together," Muscolino remembers. "It involved a lot of survey work and critical thinking. The team of engineers and contractors worked together to see what we could use, what we couldn't, and assess supplementary needs for ventilation, air changes, and pressure."

"Hospitals are set up for infectious disease control based on cascading pressure from room to room and corridors. Our goal was to increase ISO spaces for COVID-19 patients and protect all doctors, staff, and other non-COVID patients," Muscolino continues. More outside air (OA) was introduced, and by increasing airflow, he and his team achieved better air quality in the designated spaces. "We were consulting with the engineer and mechanical contractor from the very beginning. Our techs worked 12-hour shifts, Saturdays and Sundays, to meet a quick turnaround deadlines," he explains.

"No one knew what they were getting into. We didn't see drawings ahead of time, everyone was looking at them together, coming up with strategies and walking the building together," Muscolino remembers.

NEBB TAB CP Caleb Antone of Gootee Services in Metairie, LA also knows the effects of working to beat the peak outbreak well. His work at a Veterans Affairs (VA) hospital in New Orleans to increase the number of available beds from 25 to around 125 began in emergency mode.

"We came into the picture and it was a mad dash to get them where they needed to be. It was my job to verify that things could run correctly after the VA facility/maintenance staff retrofitted things like ductwork and equipment," Antone confirms. "Everyone was doing their part quickly to ensure they got the materials and equipment needed to get the job done. In order to get the right ductwork, for example, the team travelled to a neighboring city. We also had to determine how far we could push certain equipment to perform well beyond what it was designed to do. It was a challenge, but we did it," Antone recalls.

The team worked around the clock to accomplish everything in a little over four weeks. Antone said he was often working 14-hour days, and at one point worked a stretch of 16 days without a single day off. They took it one building, one floor at a time, making sure not to disturb the critical care processes occurring in the ICU while patients were there. "We needed to ensure air wasn't going to bleed out into the corridors or other areas where workers and medical staff were treating illnesses unrelated to COVID-19," states Antone. Because the VA facility was only about four years old with a pandemic area designed as part of the top floor of one of two inpatient buildings, it was better prepared than most, but still required adjustments to meet the growing needs of the virus.

"Military facilities already have systems in place to protect from bioterrorism, such as a major button that can be used to shut down the building's HVAC and close dampers off to any outside air. Now, they are working to update their facilities to also include a pandemic but-

ton which operates a little differently to accommodate a virus such as COVID-19. For example, outside air is increased, while the amount of recycled air is decreased," adds Sheppard.

Protecting High-Risk Populations

Although healthcare has made up the lion's share of work performed during the pandemic, senior living and advanced care communities have also presented important opportunities for NEBB firms.

"Long term care facilities are converting wings of their buildings into negative patient rooms in order to help protect other residents and to take pressure off of the hospitals, if necessary," mentions Kiefer. His work with the Homestead of Rochester, a facility housing long term care residents, was executed as a means of proactively preparing for the capability of serving COVID patients, if needed.

"One of our hospital clients also has a two-story nursing home on the same property. Nursing care patients from the upper floor were moved down to the 50 beds on the lower floor that were dedicated for non-COVID patients. That way, any COVID care that needed to take place on the second story did not put the healthier residents at higher risk," explains CEO of Gaghan Mechanical, Inc, Kevin Gaghan. "It's been hard finding the real estate to create the number of projected beds needed. At one facility alone, the state said they needed to come up with 200 more beds."

Essential Ingenuity

In light of the challenges brought on by a sudden pandemic, industry experts have been forced to get creative. Between starting to offer some services remotely, obtaining and teaching about PPE in resourceful ways, and meeting Centers for Disease Control and Prevention (CDC) regulations in a pinch, NEBB firms have found ways to flex their strengths in the presence of COVID-19.

"I've been on five or six Microsoft Teams meetings per day. It's a different world now. We're balancing, and consulting with engineers and mechanical contractors. We've learned we can do commissioning virtually and are doing it a lot more than we previous thought to do. We're just as efficient now as before when we were in the office—if anything, we've had to tighten things up and

Is NEBB Work Really Essential?

Ask Bart Rado, President of Air Balancing Engineers, Inc. in Berwick, PA who is currently working with various hospitals, pharmaceuticals, nursing homes and the like throughout New York, New Jersey, Pennsylvania and Virginia.

"For the first time, we have been thrust into the unexpected role of an essential worker. We're on the front lines, battling this pandemic each and every day as we protect healthcare workers, patients and scientists alike," says Rado of his field crews of skilled Local 44 Sheetmetal Union TAB Technicians who have embraced this challenge.

"Our NEBB certified techs have also been affected personally. In order to protect their loved ones, they have used extension ladders to arrive home via second story windows and decontaminate after an exhausting shift. Some techs have even had to stay in isolation at COVID-19 accepted hotels in efforts to reduce travel and risk."

Another common obstacle for work presented during the pandemic was obtaining necessary personnel protective equipment (PPE) to keep employees safe. Rado explains, "All resources available to our organization were exhausted and it was quite challenging to convey to vendors the necessity of obtaining PPE." His team was met with roadblocks like, "You aren't a government entity," or "Your firm isn't identified as a first responder," when attempting to secure it.

"Once we were able to obtain the PPE, we ramped up training and education, including re-training of donning and doffing PPE equipment and fit testing of respirators," affirms Rado. "We have always been committed to both our clients in the medical and pharmaceutical industries and our employees, and we will continue to serve as the demand for life saving air balancing work has surged!" It's safe to say the work of NEBB firms has been crucial during this critical time, and even more accurate to say just that—NEBB work *has helped save lives.*

become more efficient. Of course, there's only so much we can do virtually," states Muscolino.

Closer to the capital in Alexandria, VA, Gaghan agrees, "We have been extremely busy, designing and installing equipment in hospital rooms with rooms that have windows which open—a challenge requiring original design." He has been working with smaller size hospital clients to prepare isolation rooms, including windows that are negative pressure. The rain shield he designed for the windows prevents water and mold and allows for expanded negative isolation rooms on an as needed basis, all while meeting negative pressure CDC requirements. "State and local jurisdictions require negative rooms just for COVID patients and additional rooms for non-COVID patients to keep them separate. Once we figured out how to do one, we made little tweaks to learn how to perfect the rest."

Others faced the challenge of little to no PPE, or how to train teams on proper gowning of new PPE and were left to their own devices to figure it out. "Our client required a mask very early on, but masks were in short supply. We were only provided masks in we were working in the OR. My wife made my mask," says Kiefer.

"We set up standards and PPE requirements for working in hospitals and other COVID patient areas. In active hospitals, our techs were basically gowned up like doctors and nurses. Scrubs, booties, you name it, so we had to train guys as quickly as possible on the use of additional PPE. It was a challenge to bring them all in and do the training while social distancing. We gave them PPE in person and showed them how to put on and take off properly," Muscolino says. "Our techs really stepped up—and they were called to do a lot. I find it very admirable because they all have families, too,"

"We were lucky we had such a great group of people to work with. We had a big pool of experience to draw from for everybody to come together and make it happen. There were no egos involved; we were all working toward the same goals," affirms Antone.

The Foreseeable Future

Although initially there was no end in sight as the number of reported COVID cases soared day after day, a shift appeared to take place as more of the population began to take serious precautions to limit exposure and increase safety for all. Some fortunate states even experienced far fewer COVID patients taking up hospital beds than anticipated. In fact, some of the facilities that were built out for additional ICU capacity were barely used.

"Luckily, we haven't had to really use them. We may need them in the fall though," warns Muscolino. "Only time will tell if we have to do more," Gaghan adds.

"Now, after focusing on healthcare, setting up systems, and consulting with them the past few months, our focus has shifted to OA adjustments and supplementary filtration systems to potentially mitigate any airborne pathogens for buildings that need to reopen safely. We are assisting commercial buildings with best practices to reopen buildings to occupants. How do you bring your water systems online as safely as possible? There's an energy component to that, as well. We are helping provide safe spaces for occupants while being cognizant of energy usage," remarks Muscolino. "We're dealing with different states regulations, too."

"A lot of people have fears, but a lot of it comes down to common sense. Use PPE, protect yourself. Educate employees on what they have to do and how to protect themselves, but at the same time, don't force anyone to work where they feel unsafe," states Gaghan.

All in all, these essential services performed by NEBB CPs have helped save lives during a devastating outbreak that had already claimed over a half-million lives worldwide at the time of print. We may not know what the rest of this unprecedented year will entail, but NEBB CPs can walk confidently (and safely!) into these next months, knowing that the work they perform truly matters. ●

About the Author

With over a decade of corporate marketing experience, Kerri Souilliard has the unique ability to interpret and create brand stories for even the most complicated, technical organizations in words their target audiences readily understand. Her strong business acumen and deep understanding of many complex processes and technical disciplines blend seamlessly with her extensive background in digital strategy, copywriting, and content development to serve clients' overarching business goals—without the wasteful spending of traditional agencies. For more info, visit www.kreativstrategy.com

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The Race for Capacity During COVID 19

By Trent Mabry

Palmetto Air and Water Balance works with healthcare facilities across the Southeastern United States. Whether our teams work directly with the hospital, engineer, or contractor, balancing follows the usual process, including engineered drawings, bids, revisions, alternates, schedules, delays in the schedule, and compression or crashing the schedule at the end of projects. These are regular occurrences we manage every day.

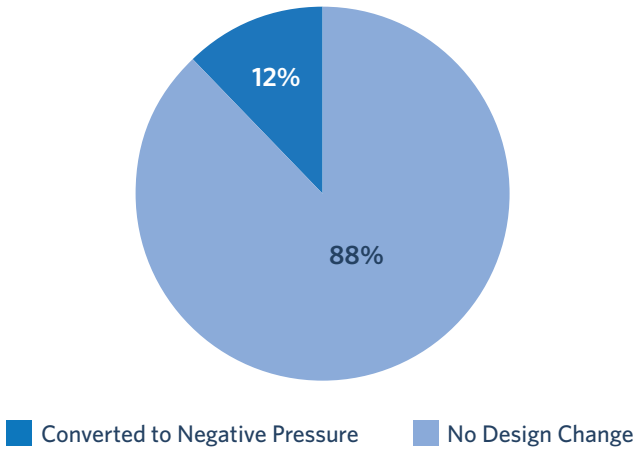
Early in the pandemic, one of our healthcare clients called with an emergency request to convert approximately 80 rooms into negative pressure zones for housing COVID-19 patients. In just a few days, the real challenge began. As the coronavirus spread, the hospital grew concerned that they would not have enough rooms to meet the infected patient load. We were asked to be part of a team that would help transform the hospital from normal operations into operating in emergency pandemic mode.

The team consisted of a local owner's representative, an engineering firm, mechanical contractor, controls contractor, and Palmetto Air and Water Balance. To make matters even more challenging, the team could not meet in person, so meetings consisted of online video calls two to three times each week. During those video calls, the team discussed changes and challenges, and the engineer would show the needs, direction, and accompanying drawings.

When the hospital first contacted us, they had decided to use existing equipment that was not previously designed to provide this mode of operation, instead of renting or purchasing additional exhaust fans to achieve the desired negative pressure. We were assigned the task of changing general patient, post-op, pre-op, and surgical area rooms into negative pressure COVID-19 rooms. The testing adjusting and balancing were not out of the ordinary, but the race to outrun the projected influx of patients presented a worthy challenge. We estimated all testing and adjustments had to be completed in a mere two and a half weeks.

The engineer had to recalculate all the design airflow values, but needed baseline testing of the existing system air volumes and room pressurization. The mechanical contractor made additional equipment changes and modifications, but needed the recalculated values from the engineer and existing capacity testing from our baseline report data.

Facility Beds Converted to Negative Pressure Zones in Two Weeks



While the engineer and contractor were developing the new design criteria for the system, Palmetto was continuing to develop and refine its safety protocols. We needed to deliver accurate and timely readings, while technicians were given the added duties of disinfecting equipment and shoes upon leaving the hospital, wearing masks on entry, and many other

protocols that could have affected the timely delivery of the project.

The project required teamwork on multiple levels. Not only did the owner's representative, engineer, mechanical contractor, controls contractor, hospital staff, and Palmetto Air and Water Balance have to stay in constant communication, but the support teams of each company had to respond with a sense of urgency and agility to daily changes. Our lead project manager worked two weeks straight with no days off to win the race against the projected patient influx. He was supported by six technicians, a team of pre-fieldwork professionals, and administrative support professionals. A team of teams working with a common goal against a global threat that arrived in our local community helped successfully complete the project on time.

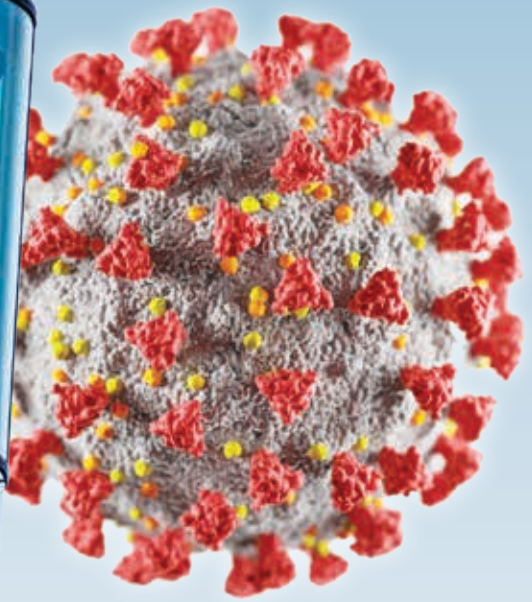
When the project was completed:

- Three separate entire HVAC systems were baseline tested and rebalanced
- A total of four separate negative pressure zones were created
- One additional zone was set up that could be quickly converted by adding two temporary walls

The testing, adjusting, and balancing requirements on the job included baseline testing and reporting, adjusting equipment to new air volumes and pressurization requirements, sharing time-sensitive project deficiencies with the team, working with the controls contractor to test the new settings, and providing the client with a final report. While many businesses were not allowed to stay open and many people were working from home, our project team worked hard on the front lines to keep medical professionals, patients, and visitors safe. The efforts of the hospital facility staff, design engineers, mechanical contractor, controls contractor, and Palmetto Air and Water Balance allowed for the successful conversion of a record number of rooms in time for the peak weeks of COVID-19. ●

About the Author

Trent Mabry, NEBB TAB CP, is a former licensed general contractor who has worked in the Test and Balance industry with Palmetto Air & Water Balance for 14 years. Trent has been a NEBB TAB Certified Professional since 2012 and is currently a branch operations manager in North Carolina.



Facility Operations During a COVID-19 Pandemic

By James Bochat

A few of our medical facility customers have recently been asking for advice on how they need to setup and maintain their temporary facilities to handle the pandemic patient overflow. I, like you, have been listening to the news over the last few months and have heard conflicting and confusing advice on what to do during this pandemic, which made me think that there is not much known data on this virus. After doing some research, I have found that is not true—we have a lot of research and quality information on viral pandemics that are similar to this virus. Even though these other viruses are not exactly COVID-19, they point the way to how we should handle the present outbreak.

So, what do these sources tell us about coronaviruses, including COVID-19?

A. The virus is transmitted by through droplets released from breathing, talking, yelling, coughing and sneezing, in ascending order of particle release dosage. There is a minimum dosage of viral particles that are needed to become infected. Particle exposure x time = dosage amount. Due to this transmission, random contact with infected surfaces is not as prominent as direct transmission.

B. The virus can live a long time on a surface where the length of time depends upon the temperature and humidity levels of the air.

C. The contagious rate appears to be high for those who come into close contact with an infected individual without proper PPE.

D. The key to safety is to not let any pathogens get into your body, mouth, nose, eye, etc. to make sure your dosage amount stays below the threshold of your immune systems capability to protect you. The preferred safety process is to keep 2 meters (6 feet) between individuals, which is considered protective, and wear a mask.

E. The statistics of infection: It is assumed receiving a dosage of around 1,000 viral particles is enough to infect an average individual. An infected individual can release up to 200 million viral particles in 30,000 droplets into a room with a sneeze. A cough can release 2 million particles in 3,000 droplets and speaking can introduce 33 particles per minute. If you are near such a person you will breath in some of the viral particles from the room. The key is to limit your exposure time so your total intake is less than 1,000 particles over the course of a day. (These sample numbers are just an example since each individual's immune system is different).

F. Small, light particles can be transmitted through air currents and can then be captured and transported through ventilation systems the same way as dust, mold, bacteria, etc. When outbreaks occur in the workplace, transmission through HVAC systems must be considered, even though there is no concrete evidence of this. Transportation of particles is possible if the air velocity is high enough and the return path is small. When humidity levels are low, water droplets evaporate leaving the virus lighter and able to be transported by air streams; when humidity is higher, water droplets gain more water and become heavier than air, causing them to fall out of the air stream quicker. Another possibility is a virus falling out of the air stream onto dust particles that are present in the ductwork, and then as the water content of the particles evaporates the dust particle is transported through the system.

What can facility managers and operators do to assist control of this viral pandemic in their facilities?

The most important task that a facility manager can do to improve the facility impact from the pandemic is to manage staff to properly engage in activities that are helpful

versus those that are not. This involves educating and training staff in the required protocols that have a direct impact on the facility containment for disease control. These are mainly facility cleaning, air filtration, amount of outside air flow, differential room pressure, room temperature and humidity levels.

Facility Managers:

During emergencies, it is important to remember everything that needs to be done to make our facilities safe must be done by a person and it does not automatically happen on its own. Sometimes we lapse back into the thought process that our facilities are automatic and do what is required for maximum safety, but that is not true. As a manager, you must ensure the proper actions are taken at the appropriate time. Items that need to be done, or verified include:

1. Verify that your staff understands what personal action they need to do to keep themselves free of the virus.
   a. Stay home if they are sick from anything, whether COVID-19 or not, and notify management of their status.
   b. Practice social distancing of at least 6 feet where possible.
   c. Wash hands with soap and water or disinfectant after touching surfaces that could be contaminated.
   d. Wear the appropriate PPE to match the task they are doing and make sure they are trained on how to use it.

2. Educate or train your staff in the proper methods of cleaning your facility in response to the pandemic. Establish cleaning schedules of what is done, what cleaning methods are used, as well as how often and by whom it is done.

3. Verify that your facility has the proper signage to instruct both employees and the general public on the proper access to your facility during the pandemic.

4. Verify that you have a written protocol on what actions are to be taken and by whom if an employee or a visitor is found to be ill while in the facility.

5. Establish a communication protocol that provides you with feedback of when required actions are taken, so that you do not assume things are done when they are not.

6. Communicate on a regular basis with your staff to keep them informed on the status of the facility and staff, as well as to communicate any change in schedules or protocols.

Facility Operators:

Operators must take action to verify that their facilities are ready for a pandemic emergency. It is normal to assume that your building and its systems appear to work correctly, and nothing needs to be done for an emergency situation such as this. The problem with that reasoning is that there is a good chance your HVAC systems have some deferred maintenance and operation issues which will negatively impact your occupants and increase their exposure. Some of these activities, and the reason for them are as follows:

Normal Facility Maintenance

1. Janitorial maintenance needs to be taken more seriously during a pandemic since surfaces may be contaminated with the virus.
   a. All surfaces that staff or visitors touch on a regular basis need to be cleaned with a disinfectant cleaner. The cleaning should be done more often for high traffic areas.

2. HVAC system maintenance must be verified as current and no deferred maintenance issues are present. This is important because clean air needs to be delivered to the occupant or patient spaces.
   a. Air filters should be clean. Consider changing both pre and final filters. Make sure the filters are the correct size and no gaps exist around the filters. Make sure the filters have the correct MERV rating and that less expensive filters with the wrong MERV rating have not been substituted.
   b. Cooling coils and drain pans should be clean without showing any signs of dust or biofouling. Biofouling occurs due to the presence of biological matter in the air stream which sticks to the heat transfer surface, allowing microorganisms to grow on the surface of the coil and more particulates to stick to the coil.
   c. Verify outside air ventilation is adequate for the occupancy and provides adequate building pressurization. Most buildings should be kept at a slightly positive pressure (+.015" of H_2O) to the ambient to prevent contaminants, temperature and humidity intrusion.
   d. Verify space temperature and humidity levels are set for the best level of containment. This

is somewhat of a problem in that the temperature and humidity level that best limits the spread of the virus is above the comfort level of occupants especially those that are wearing maximum PPE.

3. The table below illustrates a study published in 2010 on the length of time that similar viruses survived in relation to temperature and humidity. The two viruses in the study are not exactly COVID-19—one was TGEV, a member of coronavirus group 1 and the other was MHV, a member of coronavirus group 2.

Ideal temperature and humidity levels for buildings with mechanical cooling systems are 75 degrees and 50 percent (medical buildings may be 72 degrees and 50 percent), respectively, but this ideal is seldom accomplished. In the Eastern and Southern United States where humidity is high, this indoor level of 50 percent is normal, but due to the level of humidity removal, air temperature is normally colder and makes the room temperatures colder. In the West, where ambient temperatures are high and humidity levels are low, the normal temperature may be higher but the humidity levels will be much lower—closer to 20-30 percent. During normal times, your system is probably resetting these values to the most economical values possible, but those values are probably not where you want to run the system during a pandemic. Consider running your systems at as high a temperature that will be tolerated with humidity levels near 50 percent.

Facility Pressurization and Air Flow

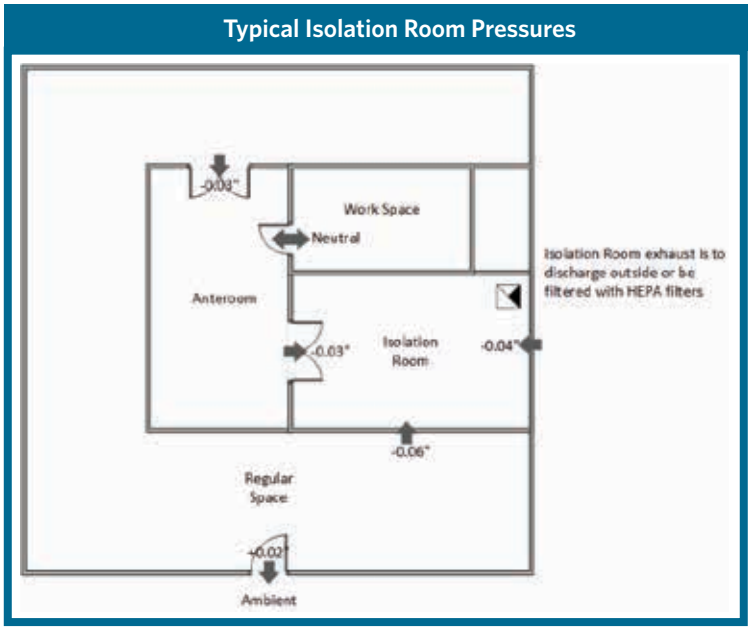
1. Normal buildings, including hospitals and office buildings, should operate with the total building air pressure being neutral or slightly positive to the outside. Normally, we like to see 0.01" to 0.02" of water pressure at outside exit doors. The reason for this is that a positive pressure building does not allow contaminants, rain or uncontrolled air to enter the building. Negative pressure buildings allow these items to enter the building uncontrolled which causes issues with controlling the indoor environment.

2. 2. Medical buildings which have operating and isolation rooms must operate differently from the rest of the building. In general, any room where patients would be compromised if an outside contaminant was present in the room needs to be under positive pressure to its surrounding rooms, such as operating rooms, trauma rooms and procedure rooms. Rooms that may have contagious occupants need to be under negative pressure to the surrounding rooms, such as emergency waiting rooms, radiology waiting rooms, triage rooms, isolation rooms and soiled storage rooms. A few facilities have special operating rooms for contagious occupants that are negative pressure but have special air filtering systems. Normally, the desired pressure differences between rooms is 0.03" – 0.05" of water, but may be less if there are more than two pressure cascades between several rooms because of door pressures issues. This sounds simple, but can become complex depending upon the layout of the rooms. The way we achieve differential room pressure is by first verifying the total amount of supply air is correct and then balancing the return system to achieve the desired pressure. A typical isolation room pressure map is as follows on the next page.

It is best practice to have pressure monitors installed near the exit doors so staff can monitor the room pressures. Another way for operators to check pressure is by using a manometer with one tube under the door. It is important to have these monitors calibrated annually to ensure they are reading correctly.

Survival Time for Viruses at Temperature and Humidity Levels

Virus	Temperature	Humidity	Days	Temperature	Humidity	Days
TGEV	68°F (20°C)	20%	28	68°F (20°C)	50%	3
MHV	68°F (20°C)	20%	28	68°F (20°C)	50%	5
TGEV	104°F (40°C)	20%	5	104°F (40°C)	50%	1
MHV	104°F (40°C)	20%	5	104°F (40°C)	50%	0.5



3. Special spaces, such as operating or isolation rooms, also have air flow requirements beyond what is required to heat or cool the space. These air flow rates are measured in air changes per hour (ACH) for both total supply air into the room and minimum outside air into the room. These supply air rates range from 6 to 20 ACH and the outside air rates range from 2 to 4 ACH. Emergency waiting rooms, isolation rooms and triage rooms are normally 12 ACH for total air into the room and 2 outside air ACH. Operating rooms are normally 20 ACH total air into the room and 4 outside air ACH. To achieve these ACH rates, these rooms must be served by constant volume flow systems. If they are served with variable volume systems, then the minimum flow setting of the supply boxes must be set high enough to never go below the minimum ACH ratings. Each medical facility is required to certify these flow rates and pressures annually to their accreditation organization

Temporary Facilities

During this pandemic emergency, many medical facilities are creating temporary facilities to treat and house the overflow of patients. Obviously, these temporary facilities cannot meet all of the normal medical room requirements, but there are a few things that can be done to improve their effectiveness for possible contamination.

1. For existing hospital space that is converted from normal patient rooms to isolation rooms, it will not be possible to achieve the ACH for these rooms in the way it would be for rooms designed for isolation. However, the correct pressure can be achieved by manipulating the air handling unit (AHU) air flows and rebalancing each room's return air grilles. First, the converted area must be separated from the rest of the building by closable doors or temporary walls and doors. If installing temporary walls, it may be necessary to install temporary plenum space dividers above the ceiling

to achieve negative pressure. This process will be easier if the area you are converting is served by separate AHUs that do not serve other spaces, but if not, it can still be done with a little more work

a. For constant volume systems, the total return air or exhaust air from the space must be increased. This is done by speeding up exhaust fans or speeding up return fans and adjusting relief damper systems to relieve more air. If the AHU does not have a return fan or relief dampers, then a temporary fix would be to install a temporary fan that pulls air from the space or return duct. If it is exposed on the roof, just make sure it is balanced to not put negative pressure on the unit return inlet. Once total space is under negative pressure, verify each room is negative to the hallway by making sure its return grille is fully open.
b. For variable volume systems, again the return or exhaust air systems need to be increased to get the spaces under negative pressure. To do this, two things need to happen. First, the space exhaust fans and return air fan air flow is increased and the AHU's relief air damper is controlled to a more open position to achieve a total negative room pressure. Do not allow this adjustment to lower the outside air flow, which is needed for ventilation air. This may require manually adjusting the relief damper linkage. Once total space is under negative pressure, verify each room is negative to the hallway by making sure its return grille is fully open. It may require adjusting down the hallway return air grilles. Since the supply system flow is variable, make sure the supply system is at full flow when verifying room pressure.

2. Temporary tent or portable building pressurization can be achieved by installing temporary exhaust fans on the space to draw them negative. Best practices would be to use temporary HEPA filter fans that would prevent any pathogens from being discharged into occupied outdoor spaces.

Facility Disinfection

Lastly, the disinfection process used is very important. Apart from testing, there is no way you can tell how well you are doing, which makes your protocol for disinfection that much more important.

1. Chemicals are used to disinfect surfaces that are routinely touched by people and major disinfection using chemicals is done between occupancies of patient rooms. The CDC has recommendations for cleaning and disinfection practices with chemicals for building surfaces which can be found online.

2. Ultraviolet light (UV-C) can be used to effectively decrease the bioburden of bacteria and pathogens by direct or reflected light shining on the surfaces of a room. If you remember, UV rays from the sun are what causes sunburn. UV rays come in three types of rays: A, B and C. Types A and B gives you a sunburn, but type C does not make it through our atmosphere—good thing, since UV-C can cause serious damage to skin and eyes. Normally, you do not get any UV-C rays except from welding or artificial lights emitting light in the UV-C band. Far UV-C light does the same job as UV-C but does not harm skin or eyes. UV-A frequency band is 400-315 nanometers, while UV-B is 315-280 nanometers and UV-C is 280-100 nanometers.
    a. There are portable UV-C systems available that can disinfect a typical patient room in one hour at the higher setting. These systems operate at a frequency of around 254 nanometers and are set up in the middle of the room with all restroom doors and all cabinet and drawers opened. The system is then operated automatically in an unoccupied room. **WARNING:** remember UV-C light is harmful to bacteria and also to you. Do not under any circumstances allow UV-C light to shine on your skin or into your eyes.

3. Bipolar ionization can also be utilized to reduce viral particles that are transported within the duct systems. When Bipolar ionization is integrated into HVAC systems, the technology utilizes specialized tubes that take oxygen molecules from the air and convert them into charged atoms that then cluster around microparticles, surrounding and deactivating harmful substances like airborne mold, bacteria, allergens, and viruses. They also attach to expelled breath droplets and dust particles that can transport viruses, enlarging them so they're more easily caught in filters. It's an active process that

provides continuous disinfection. "The ions produce a chemical reaction on the cell membrane surface that inactivates the virus. **WARNING:** Recently we have seen companies claiming their ionization systems reduce viral particles by 99% and keep spaces free of contamination, the folly here is the ionization only treats the air it is in contact with if sufficient quantities of the ionized particles are available, it does nothing for the air expelled from an infected individual in the room. So, if you are between the infected individual and the return air vent you are in harms way, but a correctly operating ionization system will clean the supply air so it does not recirculate any viral particles into the space.

4. HVAC systems are much dirtier than most people think. I've seen countless movies with people crawling through duct work that is pristine and I guarantee that can never happen. Duct work routinely collects dust and any other small particles that fall out of the air stream, including bacteria and pathogens. Since pathogens have a lifetime measured in days, we are not concerned with what remains in the duct system, but with what gets to the AHU and onto the filters and cooling coils. In light of this, we recommend changing the AHU filters more often during a pandemic and to make sure all of your AHU's coils are clean. Disinfecting cooling coils with chemicals is not recommended (unless the space is unoccupied) due to the chemical vapor discharged into the space. Disinfection of cooling coils is best done by using UV-C lights that shine directly on the surface of the coil. These lights are normally used to reduce the effects of biofouling of the coil, which increases the pressure drop, thus increasing the energy usage of the systems.

5. Air filtration can be upgraded to capture the virus particles. To do this, the MERV rating must be increased to MERV 15. Beware, however, that a MERV 15 filter has higher pressure drop than the MERV 8 or MERV 13 filters used in most systems, which may require larger fan horsepower and more energy usage.

6. Another option is to install electric precipitator filters that capture 3-micron particles with low pressure drops, they are more expensive but need changing less often.

Preparedness for Future Pandemics

After this current pandemic is over, building operators and managers will need to reassess their facility's preparedness for the next one. Specifically, for building operations, the following should be considered:

1. Consider upgrading or correcting any systems that had issues or made managing the facility more difficult during this pandemic such as:
    a. Improving your AHU filter efficiency and effectiveness.
    b. Add UV-C light systems to your cooling coils to improve coil cleaning and disinfection. This may actually pay for itself due to energy savings and reduced coil cleaning costs.

c. Improve control system configuration that will allow emergency modifications when needed.
d. Verify that your system air flows and pressurization are correct and your annual certification process is done correctly at the highest quality standard possible.

2. Update cleaning and disinfection protocols based upon this experience.

3. Make sure your facility stockpiles any PPE that is required for medical personnel and any operations personnel who are required to perform system maintenance or repair during an emergency. Any stocked PPE must be managed for renewal by using the "first in, first out" principal. This will keep the stockpile in renewed condition when needed in an emergency.

In the end, it is up to our people to keep themselves and others safe from infection. The hierarchy of action should be:

1. Personal responsibility and commitment from each individual
   a. Stay home if sick and self-quarantine
   b. Work from home when possible
   c. Monitor your own health
   d. Wear a face mask in the presence of people who you do not know or in groups

2. Perform personal distancing
   a. Work from home
   b. Observe occupancy limits
   c. Observe extra spacing
   d. Use hands-free door operators

3. Increased ventilation
   a. Increase the amount of outside air
   b. Increase the amount of exhaust

4. Better filtration
   a. Install new filters
   b. Use MERV 15 filters
   c. Use HEPA filter fans
   d. Use UV-C on cooling coils

5. Space temperature and humidity control
   a. Maintain spaces as warm as acceptable
   b. Maintain humidity near 50 percent levels

6. Cleaning and disinfection
   a. Cleaning frequency
   b. Surface disinfection
   c. Hand sanitizer use ●

About the Author

James Bochat has been involved in the Arizona Engineering and Construction industry for over forty years. His experience includes Mechanical Design, Mechanical Construction, Controls, Test & Balance, Commissioning, Retro Commissioning and On-Going Commissioning. He is a former President of NEBB and has been instrumental in developing and teaching commissioning standards for NEBB. He has been involved with ASHRAE serving as chair of the Professional Development Committee and the PMP Best Practices Committee, and voting member of other ASHRAE committees.

KFI-Engineers is an Engineering Design and Commissioning consulting firm providing MEP Engineering, Commissioning, Retro Commissioning and On-Going Commissioning and building testing services to Facility Owners.

Sources:

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How a NEBB Firm is Helping Clients Deal with COVID-19

By Nick Postolache

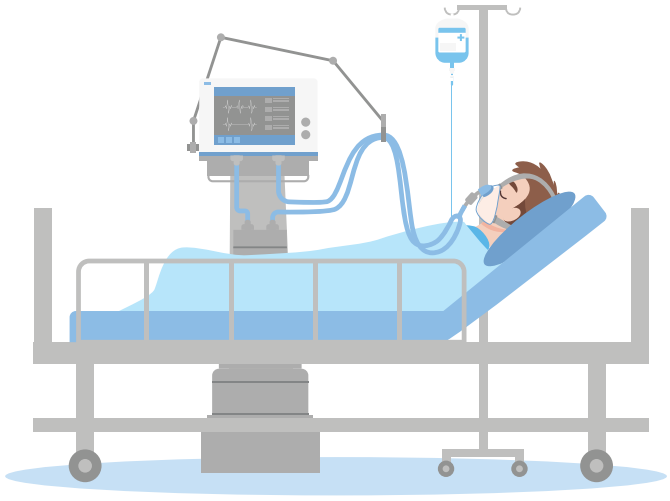
I am sure everyone will remember many years from now what they did in the spring of 2020 during the lockdown. Like everyone else, our small firm in Toronto, Ontario providing air and water balancing services didn't know what to expect from COVID-19.

By now, many balancing firms have served at the forefront of the battle helping to build rapid response units, or spending weeks in hospitals trying to help pressurizing areas in order to support containment of the virus. Our experience, however, was less exciting. For some of our clients, this was a period where they would have to perform at their peak, while others used the time to get their facilities in order and be prepared for when things return to normal.

Near the beginning of February, we had calls from two hospitals with which we worked closely in the past. They asked our firm to make sure the isolation rooms were functioning properly and to provide documentation around air changes for selected rooms.

By late February, we had started work on a large government run long term care facility named Malton Village. The project intent was to rebalance the existing building, as some ventilation issues had seemed to linger since the construction was completed in 2018. We followed all the safety guidelines in place at that time: no technician that had traveled to the Wuhan province or other affected areas.

By mid-March we had managed to balance the airflow for each room at Malton Village with all resident rooms positive to the common corridor—just before cases of COVID-19 started to multiply in our area. At that point, we consulted with the client and stopped the work, as the news made it clear that the older population would be more susceptible. We like to think that balancing the airflow for each resident room made a small difference, as no outbreaks developed in the facility.



Time Required for Removal or Settling Aerosols by Air Changes per Hour (ACH)	
Air Changes per Hour (ACH)	Time Required for Removal or Settling of Aerosols in Minutes (99.9% Efficiency)
2	207
4	104
6	69
8	52
10	41
12	35
15	28
20	21
50	8

Adapted from Centers for Disease Control and Prevent, Guidelines for Environmental Infection Control in Health-Care Facilities (2003): Table B.1. Air changes/hour (ACH) and time required for airborne-contaminant removal by efficiency. Available at: https://www.cdc.gov/infectioncontrol/guidelines/environmental/appendix/air.html#tableb1

As March came to an end, our health and safety policy had to be updated to include measures for preventing the spread of the virus. At the same time, a shortage of masks made us cancel a good number of ongoing projects, and caused worry about the length of time we would be able to continue going to sites.

Meanwhile, other clients like University of Toronto used an empty campus as an opportunity to access and complete balancing in areas that would otherwise be accessible only during nights or weekends.

In April when all the activity was legislated to stop, residential construction was allowed to continue. With a reduced crew, we continued to work on a number of condominium high-rise towers. Toronto currently has 121 cranes dotting the skyline, and 88 of them are on residential buildings—mostly high-rises.

Now as I write this in late May, activity is almost back to normal. Dentist offices are looking to open their practice cabinets and to comply with the new legislation. The Royal College of Dental Surgeons of Ontario issued a new guideline for the dentistry practices to reopen after being closed for three months. One of the new risk infection management rules refers to the "Clearing the Air of Aerosols (Fallout Time)," based on the number of air changes per room an interval of time should be allowed to pass in between patients.

For example, if 10 air changes per hour (ACH) are met, then 41 minutes should pass between patients to allow for the removal and settling of aerosols. Similarly, for 20 ACH, the time interval between patients is reduced to 21 minutes.

We're now looking to help our new clients complete measurements and advise on the additional ventilation needed in order to cut the wait time between patients. We can do that by increasing the airflow or advise on how they may decrease the room size. Self-contained filtration units are now considered to be added in the room in order to meet requirements.

Looking back, I think we missed our chance to create our own silly video clip, like the many seen circulating around when everyone was in lockdown. Maybe we'll find time whenever things slow down. Until then, I would like to repeat the words we all hear now: please stay healthy and safe. ●

About the Author

Nick Postolache is the General Manager at Enviro Balance in Toronto, Canada. He is a NEBB Certified Professional and is a corresponding Member of the NEBB Marketing Committee.

Midwest Associates Test & Balance Technicians Respond to COVID-19: Helping Create Safe Spaces for Treating Patients & Testing Essential Workers

By Virginia Eifert

Through numerous successful projects, Midwest Associates (MWA) has been privileged to build long and trusted relationships with several of Indiana's top healthcare providers. In March 2020, a representative from a large hospital in Southern Indiana requested MWA's assistance to ensure their existing isolation rooms met the Centers for Disease Control (CDC) and Prevention's newly released standard of a minimum -0.01" W.G. pressure differential. Travis Dick, a 13-year veteran of MWA and a NEBB certified technician, promptly arrived onsite. For rooms not meeting the standard, Travis adjusted fan speeds and tracked possible issues. Travis described the protocol for working in a vacated isolation room with, "Before I could enter, the room would sit empty for at least one hour, then it was deep cleaned, and finally they'd run everything under UV light. I just needed to remember to wear a mask, not touch my face, and wash my hands."

In response to the pandemic, the hospital also asked Travis to help convert 14 patient rooms into temporary isolation rooms. Since each isolation room requires its own exhaust fan to avoid cross-contamination, the mechanical contractor needed to install 14 new temporary fans, which Travis then balanced to ensure the rooms met the minimum -0.01" W.G. pressure differential. As part of the hospital's determination to safeguard its patients and remain compliant with CDC standards, its facility workers use micrometer pressure gauges to conduct daily checks of all isolation and surgical rooms. If they find a room no longer holding the minimum -0.01" W.G., they know to call Travis. Travis meticulously investigates the entire airflow system, looking for what needs to be adjusted and possible root causes like slipping fan belts, faulty VAV boxes, or stuck dampers.

As hospitals respond to the need for more isolation rooms during the pandemic, one lesson Travis hopes building owners will keep in mind is that, "the makeup air has to come from somewhere." Increasing the exhaust to create more negative pressure rooms might result in the overall building pressure no longer remaining positive. If the building doesn't already have one, Travis suggests owners consider installing a building pressure monitor.

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One of MWA's longtime partners in the pharmaceutical industry also requested help when it first became apparent that COVID-19 was spread-

ing across the U.S. Fortunately, two of MWA's most qualified and experienced balancers were already onsite working on an earlier project for this client. Larry Haynes, a NEBB certified technician, and Joe Seagraves, a certified TABB supervisor, were asked to stop the work they were doing in order to convert several offices into "clean spaces" with positive airflow migrating away from the spaces. The client needed several positive pressured rooms surrounded by existing negative pressured laboratories and corridors in order to quickly and safely set up COVID-19 testing sites. The testing sites would primarily serve first responders and people who were more likely to have been exposed to the virus. Working diligently, Larry and Joe were able to test and re-balance 16 rooms in just a couple days. Their efficient and skilled work allowed the client to provide Indianapolis with much-needed additional testing sites for COVID-19 first responders and essential workers.

*****

In early April, Cody Alford of MWA also helped a healthcare facility in Greenwood, Indiana that provides both inpatient residential care and outpatient therapy services. Having begun working for Midwest Associates as an apprentice over three years ago, Cody had already proven to be a fast learner, gaining confidence and expertise to tackle complicated problems even in unprecedented situations. Upon arriving onsite to balance an air handler unit for the healthcare facility, Cody was almost immediately asked to change focus. Concerned with the possibility that one or more of its patients might test positive for COVID-19, the healthcare provider's representative asked Cody to convert three designated patient rooms into makeshift isolation rooms with negative pressure.

Travis Dick
NEBB Certified Technician

Larry Haynes
NEBB Certified Technician

Cody Alford

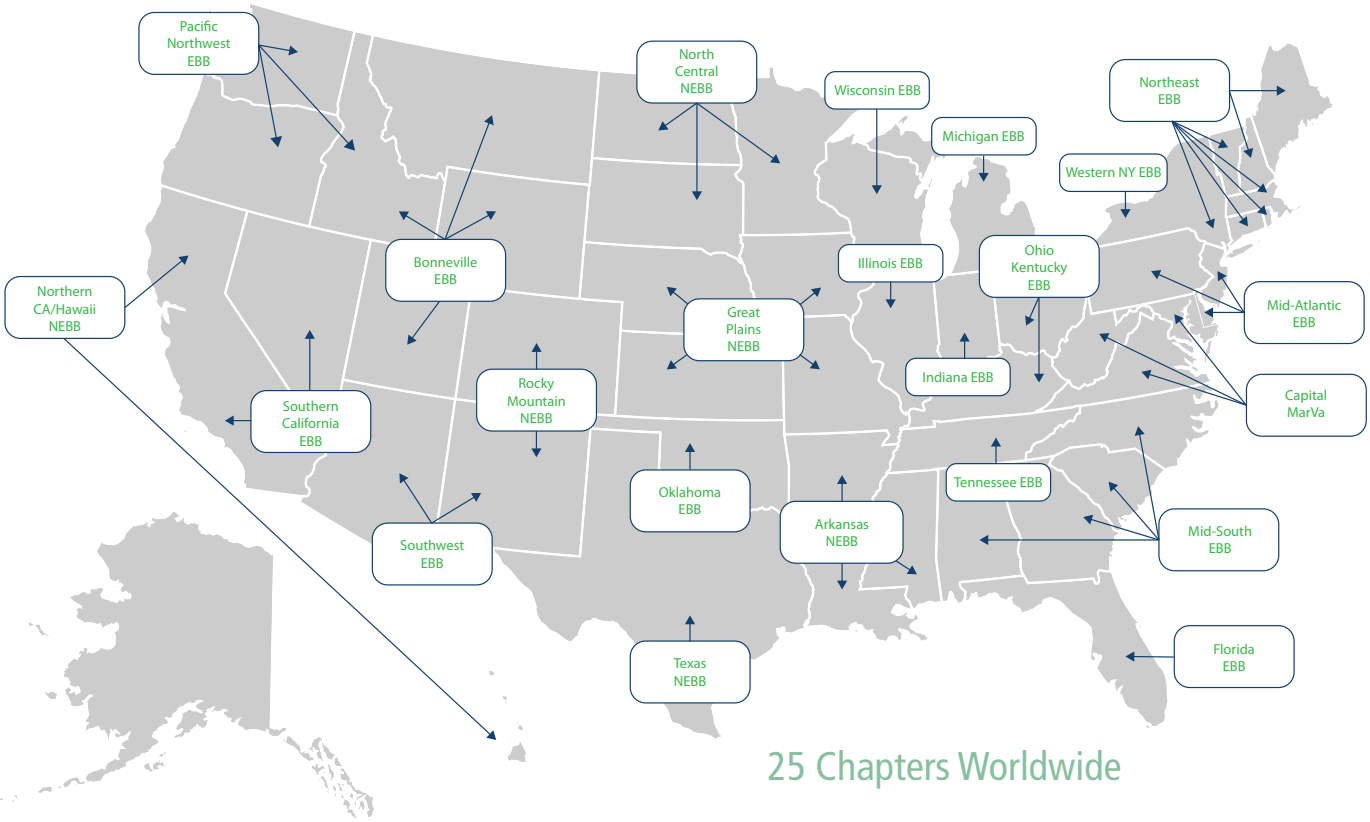
MWA worked with the mechanical contractor onsite to develop a plan. First, the mechanical contractor needed to set up temporary exhaust fans that tied into the existing return grilles in the designated rooms. Cody's job was to ensure these fans were operating properly and pulling a sufficient amount of air out of the rooms to maintain the required negative pressure. One of the biggest challenges Cody faced resulted from being asked to do this work before balancing the air handler unit that supplied the rooms.

"Having to adjust the supply into each room in such a way that the rooms still had fresh supply air while also maintaining a negative room pressure was pretty difficult," he explained. "The biggest lesson I learned is to have clear communication about the concerns of working in a potentially hazardous jobsite. This job took place just after the first wave of lockdowns, so I was pretty nervous about working in an area that could potentially expose me to the virus. But because I expressed my concern, I was given gloves and masks to ensure I would be shielded," continued Cody. Through planning, communication and applied expertise, Cody safely completed his work, leaving the healthcare facility better prepared to continue caring for patients during the pandemic.

Midwest Associates could not be prouder of the professional way each of our technicians have responded to our clients' needs during the pandemic. We'd like to thank all the Test & Balance techs across the nation for continuing to do the vital work of ensuring our hospitals, testing sites, and indoor spaces are as safe as possible. ●

About the Author

Virginia Eifert provides technical writing for Midwest Associates' commissioning projects, drafting project-specific commissioning documents and compiling systems manuals to be turned over to clients at project completion. She also assists with office operations and badging for the Test & Balance team.



Chapter Updates

Capital-MarVa International NEBB

Barbara Huber, Chapter Coordinator

Due to the new exceptions put into place by NEBB for 2020 Chapter Seminars and CEU's, Capital MarVa has decided to cancel their September Recertification Seminar.

If you have any questions, please contact the Chapter Coordinator, Barbara Huber.

Florida EBB

Terry Wichlenski, Chapter Coordinator

Florida EBB's 39th Recertification Seminar & Annual Chapter Meeting is scheduled for November 12-13, 2020. The meeting will take place at the Omni Champions Gate Hotel in Orlando, Florida. Please contact Terry Wichlenski, Chapter Coordinator, at Febbcoordinator@gmail.com for more details and the registration form.

The Omni Champions Gate Hotel

Their next NEBB TAB Practical Exam will be conducted on September 11, 2020 or September 12, 2020 at either the Jacksonville, Largo or Deerfield Beach Test site. For additional information, please contact Terry, FEBB Chapter Coordinator at 707-240-4254 or by email at Febbcoordinator@gmail.com.

Great Plains NEBB

Shelley Klein, Chapter Coordinator

The Great Plains NEBB Chapter seminar is scheduled for Thursday, September 24, 2020 at Tiffany Greens Golf Club in Kansas City, MO.

Michigan EBB

Aneta Torrence, Chapter Coordinator

Michigan EBB Chapter's Annual Recertification meeting is scheduled for November 6, 2020 from 8:00 a.m. – 5:00 p.m. in Lansing Michigan. The meeting will take place at the Henry Center, Michigan State University Campus. Speakers will be Norm Hall with R L Depmann and Harold Pudvay with CRC.

Northern California/Hawaii NEBB

Audrey Kearns, Chapter Coordinator

Northern California/Hawaii NEBB's Annual Chapter Meeting has been postponed from October 2, 2020 to Spring 2021. The meeting will still be held at the Monterey Plaza Hotel & Spa in Monterey, California.

The following speakers and presentations are currently scheduled:

- The California Standards Building Commission speaking on: Non-residential CALGreen Code Updates and Checklists, How to use Title 24 and the Matrix
- Adoption Tables, and Code Adoption Process and Public Participation; Eli Howard and Mark Terzigni, SMACNA on the HVAC Air Leakage Test Manual

Rocky Mountain NEBB

Stuart McGregor, Chapter Coordinator

The Rocky Mountain NEBB Chapter Annual Recertification meeting will take place in the Fall of

MAEBA

Trish Casey, Chapter Coordinator

MAEBA has changed the location of its Annual Recertification Seminar on September 20-21, 2020 to the Hershey Lodge in Hershey, PA, due to social distancing requirements.

All are welcome to join the MAEBA Chapter beginning Sunday evening with a Dinner Reception at the Lodge, followed by a full day of great educational topics and vendor displays.

Some of the topics being presented this year are:

- "ECM Driven Pumps", by John Boyle, Vice President of Engineering of R.D. Bitzer Co., Inc.
- "Cyber Crime and Security - The impact that cyber intrusion can have on your business," by Derek Hedrick of Ameritech Data Solutions
- "Building Enclosure Testing (BET)", by Phil Emory, NEBB Board of Director and Senior Project Manager of Neudorfer Engineers, Inc..

To reserve at hotel room at the Hershey Lodge go to: https://book.passkey.com/go/MAEBA

Please note MAEBA's new mailing address: 275 E. Street Road #57, Feasterville, PA 19053.

The Hershey Lodge

2020. Currently the date has not been confirmed. Stay tuned!

SoCal EBB

Jim Rosier, Chapter Coordinator

The SoCal EBB Annual Meeting has been rescheduled for Friday, November 6, 2020 from 7:00 a.m. to 3:00 p.m. at the Diamond Bar Golf Course in Diamond Bar, California. For more details or registration information, contact the Chapter at 714-998-6322.

Texas NEBB

Sandee Morgan, Chapter Coordinator

The Texas NEBB Annual Meeting and Recertification Seminar has been rescheduled for Thursday, September 24, 2020 at the DoubleTree Dallas Love Field.

Some of the topics being presented include: *3 Keys For The Perfect Hydronic Control by Luciano Belo of IMI; Inside The Box – Fan Characteristics and Applications* by Mark Fly of AAON, Inc.; *Fluid Dynamics* by Nick White of ND White Engineering and our final speaker, Derek Hedrick of Ameritech Computer Consultants.

Wisconsin EBB

Jonathan Kowalski, Chapter Coordinator

The Wisconsin EBB Annual Chapter Meeting will be held on November 2, 2020 from 8:00 a.m. to 4:00 p.m. at the Chapter's office in Milwaukee/Wauwatosa.

The following speakers are scheduled to present: Gus Farris with Nailor, and Bob Kramer with Building Start. ●

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NEBB 2020 Technical Seminars Schedule

All Training/ Educational Seminars have been canceled thru the end of 2020.

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