The NEBB Professional

2022 – Quarter 1

NEBB TAB Reports: Are They Compliant?

The official magazine of

EVERGREEN TELEMETRY

WRIST REPORTER

ONE WIRELESS METER for
AIR · WATER · TEMP · Cx
HUMIDITY · TAB · DATALOG

- Room Pressure
- Building Pressurization
- Airflow with Capture Hood
- Duct Pressures
- Velocity with Pitot Tube or Foil
- Datalogging

Store readings easily using the Thumbswitch

Faster. Easier. Safer.

www.EvergreenTelemetry.com

CAPTURE HOODS With unique features for higher productivity.

FEATURES

- Weighs much less than conventional hoods
- Designed for reduced backpressure
- Constructed from high-tech materials
- Damper adjust - real time feedback at wrist
- View 4 Hoods on one Wrist Reporter
- Wireless sensing module sends continuous stream of readings to the Wrist Reporter

APPLICATIONS

- Commercial Ceiling Diffusers
- Return Air
- Sidewall
- Low-flow Exhaust

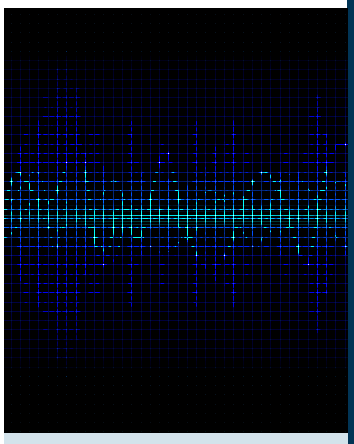
FREE

Field Trials!
Call Today!
602-574-6192

Contents

Quarter 1 – 2022

Features



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

PRESIDENT'S MESSAGE

Well, I've now been President of NEBB for a little over 3 months, and I can honestly say that I have a deeper appreciation for our volunteers than ever before. This was pretty hard to do, considering I already had a huge appreciation for the countless hours that these men and women give. There are so many exciting projects in the works right now that will be completed over the course of the next few weeks, months, and years, that I could pick any given moment of any day and be able to catch an ongoing phone or video conference with a NEBB Volunteer group!

And while all our volunteers are working hard, so is our staff. NEBB TEC continues to be built out with exciting features that all disciplines will be able to use and provide hands on training. The NEBB Learning Center continues its development with committees converting seminars, short lessons, and interactive components into online focused content. The new NEBB Website is beginning to take shape and become a central point of access for both NEBB Certified individuals, and those seeking services from NEBB Certified Firms!

All of the above activities are helping to prepare NEBB for the future! The next generation of NEBB Certified Professionals are hungry for knowledge and experience. These projects will help prepare this next generation in a format that best suits them. From in-person seminars to online classes to hands-on high level technical training, NEBB will be the epicenter of instruction for the building systems testing professional. When someone is seeking to expand their skills, we want NEBB to be the first place they look.

One of the joys of being part of the board of directors for NEBB is getting to visit with chapters and see the work that is being done by volunteers in various locations. These chapters are the lifeblood of our existence, and the training and education of every NEBB Certified individual starts at this level. The chapter is your first point of contact, and most likely where you progress to being involved across multiple chapters at a national or international level. These chapters provide the connection between individuals and the network

that makes us thrive. When NEBB has a need, the local chapter is the first place we turn. I personally owe the success of my personal business to my local chapter. My business partner passed away from cancer is 2015. No less than 5 people from my chapter called and offered any and all help we needed during that time. And these close friends saw to it that I had what I needed to succeed and thrive. Without them, I am positive my business would not exist today. I can only hope that every NEBB Certified Individual (technician or professional) can develop as close of a bond to the members of their chapter as I have with mine.

In 2022 I hope to visit and meet as many new people as I can and learn about what makes you proud to be a NEBB Chapter, NEBB Firm, and NEBB Individual. The more I learn, the more I fall in love with this organization. And I hope to see you all in Charleston, SC this November for the NEBB Annual Conference!

Jon

Jon Sheppard
NEBB President

MENSAJE DEL PRESIDENTE

Bueno, he sido Presidente de NEBB por un poco más de 3 meses, y puedo decir honestamente que tengo un mayor aprecio por nuestros voluntarios que nunca antes. Esto fue bastante difícil de hacer, considerando que ya tenía una alta apreciación por las horas incontables que estos hombres y mujeres brindan. ¡Hay tantos proyectos excitantes en desarrollo en este momento que serán completados durante el curso de las próximas semanas, meses y años, que podría escoger cualquier momento de cualquier día y lograr conectarme a una conferencia telefónica o video conferencia con un grupo voluntario de NEBB!

Y al igual que nuestros voluntarios están trabajando duro, lo hace nuestro staff. El Centro de Educación Técnica de NEBB (NEBB TEC) continúa siendo construido con características excitantes que todas las disciplinas van a ser capaces de usar y proveer entrenamiento práctico (¨hands on¨). El Centro de Aprendizaje de NEBB (NLC por sus siglas en Inglés) continúa su desarrollo con los Comités convirtiendo seminarios, lecciones cortas y componentes interactivos en contenido enfocado para uso en línea. ¡El nuevo sitio web de NEBB está empezando a tomar forma y a convertirse en un punto central de acceso para ambos, Individuos Certificados y aquellos buscando servicios de firmas certificadas NEBB!

¡Todas las actividades anteriores están ayudando a preparar a NEBB para el futuro! La próxima generación de profesionales certificados NEBB están hambrientos de conocimiento y experiencia. Estos proyectos van a ayudar a preparar a la siguiente generación en el formato que mejor se adecúe a sus necesidades. Desde seminarios en persona a clases en línea a entrenamiento práctico de alto nivel técnico, NEBB va a ser el epicentro para el entrenamiento del profesional para pruebas de los sistemas de los edificios. Cuando alguien esté buscando expandir sus habilidades, nosotros queremos que NEBB sea el primer lugar que ellos miren.

Una de las alegrías de ser parte de la junta directiva de NEBB es realizar la visita a los Capítulos y ver el trabajo que está siendo realizado por voluntarios en varios lugares. Estos Capítulos son el alma de nuestra

existencia, y el entrenamiento y educación de cada individuo certificado NEBB empieza en este nivel. El Capítulo es el primer punto de contacto y muy probablemente hacia donde progresa el profesional al ser involucrado con múltiples Capítulos a nivel nacional o internacional. Estos Capítulos proveen la conección entre individuos y son la red que nos permite prosperar. Cuando NEBB tienen una necesidad, el Capítulo local es el primer lugar al que vamos. Yo personalmente le debo el éxito de mi negocio personal a mi Capítulo local. Mi socio de negocios falleció de cáncer en 2015. No menos de 5 personas de mi Capítulo me llamaron y ofrecieron cualquier tipo y toda la ayuda necesaria en ese momento. Y estos amigos cercanos vieron por mí y se aseguraron que tuviera todo lo que necesitaba para ser exitoso y prosperar. Sin ellos, estoy convencido que mi negocio no existiría hoy. Yo solo puedo esperar que cada Individuo Certificado NEBB (Técnico o Profesional) pueda desarrollar un vínculo tan cercano con los miembros de su Capítulo como yo lo tengo con el mío.

En 2022 tengo la esperanza de visitar y conocer tanta gente nueva como pueda y aprender acerca de lo que los hace sentirse orgullosos de ser un Capitulo de NEBB, una Firma NEBB y un Individuo NEBB. Entre más aprendo, más me enamoro de esta organización. Espero verlos a todos en el mes de noviembre en Charleston, SC, para la Conferencia Anual de NEBB.

Jon

Jon Sheppard
Presidente de NEBB

the Latest Advancements in Airtightness Testing

Large Building Blower Doors

The most advanced product line.

Test any sized building.

Large Building DucTesters

Lightweight, handheld, dependable.

A fraction of the weight of competing units.

Online Store Open

retrotec.com

Get to know... the retrotec Lineup

- Easy to Learn & Use
- Fast Setup & Teardown
- Online Training & Certifications
- Reporting Software Available

NEBB Staff

TIFFANY MEYERS	Executive Vice President
SHEILA SIMMS	Individual Certification Coordinator
STEPHANIE HUDSON	Manager of Finance
SUMAYYAH MILSTEIN	Firm Certification Coordinator
CHRISTINA SPENCE	Executive Assistant
CRISTI ARBUCKLE	Exam Coordinator
SAMANTHA HAWA	Online Learning Coordinator
JEFFREY SCHOOLS	Technical Director

Editorial Staff

Audrey Kearns	Editor

NEBB Board of Directors

2022

President

JON SHEPPARD — Powhatan, VA

President-Elect

PHIL EMORY — Seattle, WA

Vice President

LUIS CHINCHILLA — Tres Ríos Cartago, CR

Treasurer

MIKE KELLY — Bethlehem, PA

Past President

AMBER RYMAN — San Leandro, CA

Board of Directors

BRIAN HILL	Lee's Summit, MO
RODNEY HINTON	Greenville, SC
BRIAN KELLER	San Antonio, TX
ALLEN KING	Gaithersburg, MD
PATRICK LAW	Altamonte Springs, FL
JONATHEN LLOYD	Queensland, AUS
DONALD PITTSER	Erie, CO
ROGER WEHBY	Nashville, TN

Committee Chairs 2022

JON SHEPPARD	Committee Chairs
MIKE PEAK	Building Enclosure Testing
JIM WHORTON	Building Systems Commissioning
CODY LEE	Chapter Affairs
TIFFANY RUSSELL	Cleanroom Performance Testing
LUIS CHINCHILLA	Exam Development
BOHDAN FEDYK	Fume Hood Testing
ALLEN KING	Marketing
KEVIN GAGHAN	Sound & Vibration
DONALD PITTSER	Testing, Adjusting & Balancing
CURTIS WORLEY	Title 24

CONTRIBUTORS

Jonathen Lloyd is a NEBB Certified Professional (TAB) serving as a voting member of the NEBB Young Professional's Network, NEBB TAB Committee and NEBB Board of Directors.

Donald W. Pittser is a NEBB CP, TAB, Cx, S&V, NEBB National TAB Committee Chairman, member of NEBB National Board of Directors as well as the Rocky Mountain Chapter and President of JEDI Balancing.

Robert Shorr is currently President of Accurate Balancing & Commissioning, President of FEBB Board of Directors, and Loxahatchee Groves Town mayor.

Tarek Omar is the Partner Director of TAB Egypt and CEO of TAB Group, with his NEBB certification in TAB and S&V.

Kerri Souilliard is an independent contract writer for NEBB. For more information on Kerri, visit: www.kreativstrategy.com.

Jeff Schools is the Past President of NEBB and has taken the new role of the NEBB Technical Director.

A message from the editor

AUDREY P. KEARNS

As you can see from our President's Message, NEBB is taking big strides this year. We started off President Jon's year with a big splash in beautiful Hawaii and we haven't looked back since.

NEBB TEC is busy being completed and will be up and running soon. This has been a big project and NEBB is extremely excited to have completion done in the near future. We will be featuring the new training facility in our future edition of the magazine. Stayed tuned for pictures and more details.

The new NEBB Learning Center is up and running on nebb.org. Included in this quarter's magazine is an article about the new on-line training platform. You will discover all the benefits this new platform will provide to you once you have a chance to log on. We hope to have a more in-depth article in a future edition highlighting stories of success and how the new training program is working.

Speaking of looking on the NEBB website for the NEBB Learning Center, have you seen NEBB's new, clean, fresh, modern website? If not, log on today. A lot of thought and hard work went into making the site user friendly. It is full of information as usual, just easier to navigate.

Exciting for me as editor of the magazine, is the new NEBB Professional QR Code. Scan this code and it will take you directly to the NEBB website page with all past editions of the magazine. These magazines are a wealth of information and the QR Code is just the first step to help make it easier for you to access that information. The QR Code can be found in a prominent spot in this magazine!

These are just a few of the new things happening at NEBB. Stayed tuned for more!

Audrey P. Kearns
Editor

NEBB TAB Reports – Are They Compliant?

By Donald W. Pittser

What do you do when you need help? Where do you go? Who do you ask? Most TAB Firms are just trying to keep their doors open, their employees working, pay the bills and make a profit. All the while, staying up to date with the NEBB TAB Procedural Standard changes. When you are the owner, all your employees and some customers come to you for the TAB answers. If you are the NEBB Designated Certified Professional (DCP), you are expected to have the answers to all NEBB specific questions for your discipline. Who can you ask if you have a question? Hopefully you have a peer group or better yet, a mentor you can call. Improvement is a continuous goal that we must all strive to achieve.

Each NEBB TAB Firm is required to produce NEBB TAB Procedural Standard 2019 – 9th Edition compliant TAB Reports when stamping their reports with the NEBB TAB Stamp. The NEBB *Procedural Standard for Testing, Adjusting and Balancing* (TAB) *of Environmental Systems 2019* – 9th Edition was issued to the NEBB Membership on July 15, 2019. This replaced the NEBB *Procedural Standard for Testing, Adjusting and Balancing of Environmental Systems 2015* – 8th Edition (PS8).

The credibility of NEBB is built by maintaining integrity through high standards, quality programs and demonstrated capabilities of NEBB Certified Firms. Building owners are entitled to a professional service by every NEBB Certified Firm on every project, whether the job is NEBB specified or not. It is the responsibility of the NEBB Certified Firm and NEBB Certified Professional to establish and maintain procedures and practices that will assure a consistent pattern of high-quality work on all projects.

Is there such a thing as a NEBB Certified Project? No, NEBB does not certify projects. However, it is common to hear "NEBB certified project" when referencing a project that will have a NEBB Certified TAB Report issued. Project scope is guided by the project specifications. Project TAB procedures will be guided by NEBB *TAB Procedural Standard*, recorded in the TAB report,

and will serve as a record of data acquired and work performed.

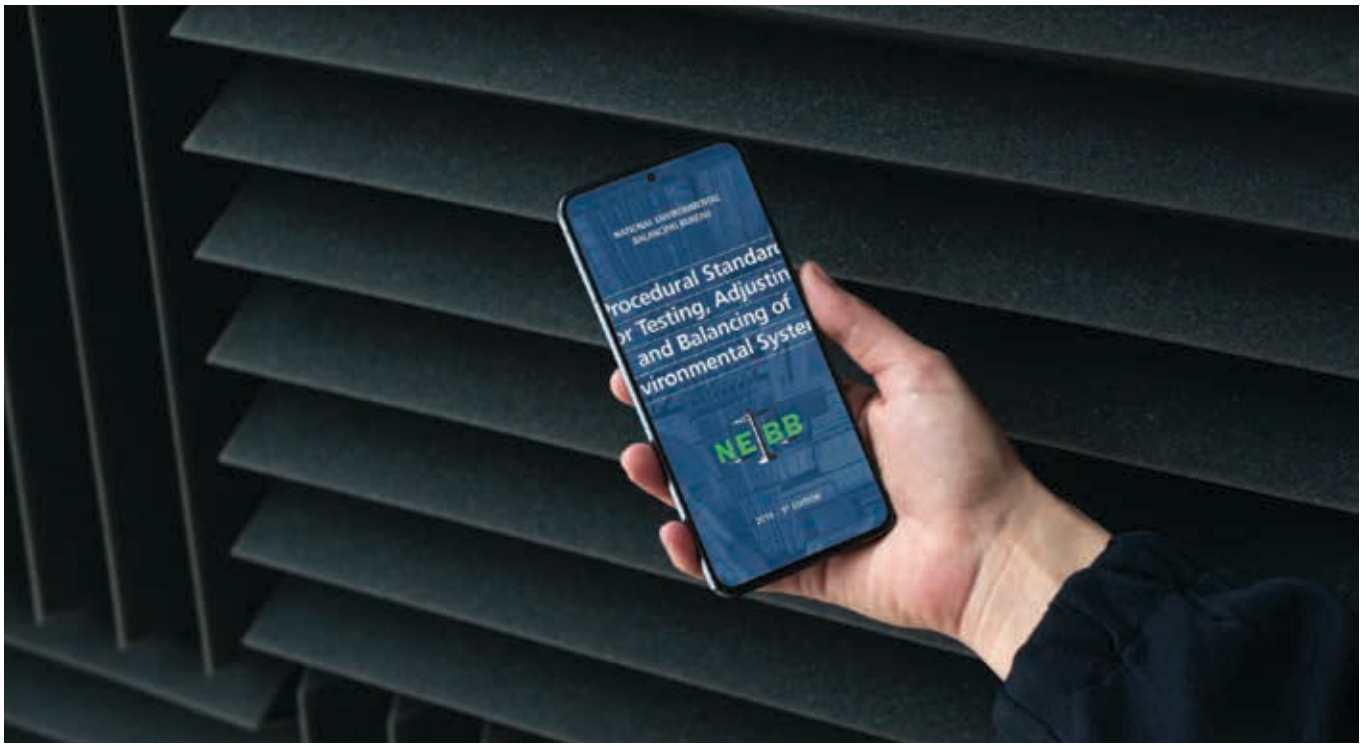
How long does a NEBB Certified Firm have before a NEBB Certified TAB Report must be PS9 Compliant? Regardless of project specifications, data acquisition will always conform to the NEBB *Procedural Standard* **in effect at time contract was issued**. All TAB projects contracted after July 15, 2019; with NEBB Certified TAB Reports being issued after January 1, 2020; must be compliant to the NEBB *Procedural Standard for Testing, Adjusting and Balancing of Environmental Systems 2019* – 9th Edition (PS9). NEBB allowed a six-month timeframe for NEBB Firms to update their TAB Report Formats.

What if a project TAB specification exceeds the NEBB Procedural Standard 9? If the project TAB specification requirements exceed the current NEBB *Procedural Standard*, those specifications will take precedence. For instance: NEBB Specification suggests +/-10% on TAB airflow and water flow measurements due to equipment accuracy. The project specifications lists +/-5% on final TAB airflow and water flow measurements. The project specifications take precedence over NEBB PS9 Appendix Specifications. The TAB Report will reflect +/-5% on TAB airflow and water flow measurements.

What if a project TAB specification / TAB Contract are less than the NEBB Procedural Standard 9? If the project TAB specification requirements are less than the current NEBB *Procedural Standard*, the specifications will take precedence and be noted in the TAB Report Project Summary. For instance: NEBB requires +/-10% on TAB airflow. The project specifications list +/-15% on TAB airflow when three or more supply diffusers serve one room. The TAB Report will reflect +/-15% on TAB airflow measurements and be noted in the TAB Report Project Summary. The TAB Specification / Contract requires new AHU's capacity testing only and no downstream TAB. Perform the TAB on the AHU's and note project requirements in the Report Summary.

Who issues a NEBB Certified TAB Report? Only a NEBB TAB Certified Firm (CF) can issue a NEBB Certified TAB Report. Each NEBB Certified Professional's Stamp has a NEBB Certified Firm's name on the NEBB Stamp. A NEBB Certified Professional can only be employed by one NEBB Certified Firm at a time. A NEBB Certified Professional (CP) must supervise all work recorded in a NEBB Certified Report.

Who can perform TAB in a NEBB Certified TAB Report? The NEBB Certified Professional is responsible for ensuring either a NEBB Certified Professional or NEBB Certified Technician is **continually present while TAB work is being performed on every NEBB certified project** and directing those technicians in performing the work. The NEBB Certified Professional is ultimately responsible for the accuracy of any field measurements and certified reports generated. A NEBB Certified Professional or



NEBB Certified Technician can direct non-certified technicians on the same project and must be onsite. A TAB Technician needs a minimum of two years field experience to apply for the NEBB Certified Technician exam.

Can a NEBB Certified Firm issue a non-NEBB Certified TAB Report? Yes, if the TAB Final Report is issued without a NEBB TAB Stamp, without using the NEBB Logo, and without referencing or mentioning NEBB. The NEBB TAB Stamp does not certify or apply to Pre-Read Reports, Survey Reports, System Readiness Reports, Duct Air Leakage Test Reports (DALT) or Commissioning Reports and are non-NEBB Certified Reports. Only the TAB Final Report shall have the NEBB Stamp and Certification page included. All other reports must be issued without using the NEBB Logo, NEBB Stamp, and/or referencing or mentioning NEBB.

The NEBB *Procedural Standard for Testing, Adjusting, and Balancing of Environmental Systems* – 9th Edition, establishes minimum requirements of a NEBB Certified TAB Report in Section 5 Standards for Reports and Forms.

Section 5.1 Reports: NEBB does not require the use of NEBB produced forms. Customized forms are acceptable based on the data acquisition requirements of this section. Contract document data reporting requirements shall take precedence when they exceed minimum requirements of NEBB. If a reporting platform software is used, it is the sole responsibility of the NEBB CP to ensure that submitted reports are NEBB Compliant!

Section 5.2 Report Content: Listed below are the minimum requirements for each NEBB Certified TAB Report.

Section 5.2.1 Report Title: Include: The heading: "Certified Test, Adjust and Balance Report" (Project Name/Address; Engineer Name; HVAC Contractor Name; NEBB Certified TAB Firm Name / Address / Certification Number).

Section 5.2.2 Report Certification: The certification page bears the stamp of the NEBB Certified TAB Professional (CP). The stamp on the certification page is signed as evidence the CP has reviewed the report and assumes responsibility for all work, test methods and observed conditions documented within. The Report Certification page must include Project Name; Certifying NEBB Certified TAB Professional's Name; Firm Name;

Certification Number; Expiration Date; Certifying NEBB Certified TAB Professional's NEBB Stamp (signed & dated); and the following exact verbiage:

"The data presented in this report is a record of system measurements and final adjustments that have been obtained in accordance with the current edition of the NEBB *Procedural Standard for Testing, Adjusting and Balancing of Environmental Systems*. The measurements shown, and the information given, in this report are certified to be accurate and complete, at the time and date information was gathered. Any variances from design quantities, which exceed NEBB tolerances, are noted in the TAB report project summary."

Section 5.2.3 Table of Contents: The table of contents, with page numbers or clickable links, serves as a guide to the organization of the TAB report. For digital reports, bookmarks may be used as the table of contents as long as every data page has a consecutive and unique page number.

Section 5.2.4 Report Summary / Remarks: A NEBB Certified TAB Report is required to include a narrative description of system set-up conditions established prior to testing, adjusting, and balancing. The narrative must explain the rationale for how the system was configured for testing, such as to establish full flow conditions, control configuration, and the steps taken to achieve the desired set-up. This section shall also include a listing of deficiencies in the summary and identify the appropriate pages in the report. Part of the Certified Professional's responsibilities is to determine "noteworthy" deficiencies. This section might also be used to discuss possible recommendations such as solutions to system balance issues. A summary of all *Procedural Standard* items that exceed NEBB and/or Contract Document tolerances or any other items that require discussion or explanation shall be included. A list of all items which could not be obtained for reasons beyond the control of the Certified Firm shall be included.

Section 5.2.5 All Report Pages: All tested items included in the NEBB TAB Report shall be clearly identified with a unique designation. Schematic diagrams, mechanical plans where permissible, or a narrative description may be used. Each data form supplied in a NEBB TAB Report shall include the name of the individual who reported the information, along with the date the data was collected. Each report page must include the project name, sequentially numbered pages, and remarks section to record pertinent information.

Section 5.2.6 Instrument Calibration: This is a listing of the instruments that were used on the project or will be used to verify the reported data including instrument type, manufacturer, model number, serial number, and calibration date.

Section 5.2.7 Abbreviation List: This is a listing of any abbreviations or acronyms used in the report shall be defined in an abbreviation list.

Section 5.2.8 Drawings and Schematics: The TAB Report must include pertinent contract drawings, schematics, sketches, or other mechanical plans where permissible, that identify the area, location, etc. of the tested equipment / systems. A narrative description may be used.

Section 5.3 TAB Equipment Report Forms: Please see the NEBB *TAB Procedural Standard 2019* – 9th Edition for the requirements for various types of equipment, systems, and measurements in a NEBB Certified TAB Report.

If you would like for your NEBB Chapter to receive Continuing Education Credits (CEC's) training on NEBB TAB Procedural Standard 2019 – 9th Edition TAB Report compliance or if you would like specific help with your NEBB TAB Reports to achieve NEBB TAB Procedural Standard 2019 – 9th Edition compliance, please contact the NEBB TAB Committee Chairman found on www.nebb.org. ●

TESTING AND BALANCING, A VIEW FROM DOWN UNDER

By Jonathen Lloyd

INTRODUCTION

Testing, Adjusting, and Balancing of air conditioning systems is an incredibly important phase of every building and facility, no matter its function or purpose. There are multiple stages to be considered during design, construction, testing and even post completion. In this document, I will provide insight into a few of the important and often overlooked essentials of building systems.

The opinions in this article are my own and, although they may align with other organizations, they remain solely my own opinions.

CONDITIONS

Temperature is probably the most obvious or perhaps, to put it better, the most talked about element of air conditioning. Temperature to the tenant or occupant is a simple word that means simply "make me comfortable." Unfortunately, temperature has many deciding factors that stretch from design through the installation and commissioning even to the way the space is used.

To break this down, I'll use an example. Let's take a print / copy room (Only the engineer isn't aware it's a print room). The engineer generates a flow rate on the room requirements, and it should work. No design review takes place, there just isn't time, and the installation process gets underway. The flexible duct is to be installed to a standard but that's too costly and time consuming and no one does it right anyway. Now the balancers come in and they proportionally balance the registers and walk away. The tenant finally moves in and the complaints are immediate. Typically we address some or maybe most of these items by peer review on behalf of the client. "Hey this is a print room. You're going to need more air to maintain conditions in this space." "Before you continue with the installation, I want to witness that the duct is sealed correctly and installed to the nominated standard." "I can see that you balanced the registers but what is the unit actually doing?"

Design

Design reviews are not intended to embarrass an engineer. If I had to focus on ten projects at one time, I would miss things as well. Thankfully, the intention of the design review is to catch any design issues that can easily be missed. During this process, test plans and reports can be generated which can assist with the review by ensuring that heat transfer requirements are sufficient. If they are not, was this intentional or does someone need to call the manufacturer to change a piece of equipment?

During the completion of the test and balance report forms, we can review the equipment design data, duct shop drawings, commissionability, accessibility, and so forth, on paper. The design engineer (engineer of record) can then ensure it is correct to the owner's project requirements and amend the contract documents if required. Then the development of a test plan of how to execute the commissioning process can take place.

Installation

U-Factors measure the rate of heat transfer of building materials and how well they insulate a space. Every substance has a rating that needs careful consideration when designing the HVAC (Heating, Ventilation and Air Conditioning) systems for a space. Just as important is the climate surrounding the building's location. This allows the designer to select suitable materials for both the structure and the equipment.

Leakage testing is a major part of the installation process both for structure and for the HVAC systems. Energy consumption and heat transfer can be majorly affected if this process is not performed correctly. We perform the building enclosure testing to make sure that an allowable leakage rate is maintained to prevent excessive energy consumption and to always keep conditioned air within each space. The same is equally important for ductwork. Ductwork is the conduit for the air to transfer heat from one space to the medium, where it is rejected. Heat transfer relies on the integrity of its path. If the ductwork leaks, the rejected heat is not truly rejected. In the same fashion, the energy consumed to overcome these leakages can be to the tune of 40% above the required consumption.

Setting up the system

Testing, Adjusting, and Balancing (TAB) of environmental systems is critical in the temperature control process. All the ductwork has been sealed accordingly, however, all the air is passing through one register and not the other. This system is unbalanced and now has temperature issues. If balanced correctly, each space will have sufficient heat transfer capabilities and will remove the desired quantity of heat from a given space. Balanced incorrectly, you will have hot and cold areas. TAB isn't just proportionally balancing a few registers. In fact, TAB is effectively and efficiently tuning building systems to perform optimally as per the engineer of record's (EOR) design intent.

To carry out the TAB process correctly, a thorough review of each process is a necessary component of every project. Can a system be tested and balanced correctly? Are there sufficient control points fitted to each system to ensure its most efficient setup? Does the design allow for best practices of the TAB process? How good is the equipment access? Has the design considered future service and maintenance? Has sufficient time been provided in the program to carry out the works? All of these questions must be addressed, or the occupants will suffer as a result. Once this review is completed, the execution of the test and balance process is equally important.

TESTING, ADJUSTING, AND BALANCING

Air mixture

Air mixture is the term used when discussing outdoor air and return air. It is crucial that the right amount of outdoor air is supplied into each systems space. Outdoor conditions can vary substantially. The heat transfer process can be drastically affected by the incorrect delivery of the mixture. A system designed to a certain heat capacity will struggle to effectively operate if the mixture is incorrect. The designer has calculated the heat transfer process at a certain outdoor air infiltration percentage. If this mixture is incorrect, the system will struggle to maintain conditions. If there is too much outdoor air pressure, problems will become apparent.

Pressure

Pressure is another part of the process that requires careful attention to detail. Doors can be held open or they can be forced shut. Other components of a building, such as elevators and stairs, can be affected by too much pressure

or not enough pressure. In a hospital, pressurization control is essential to contain infections and disease into a designated space. Similarly, an operating room must keep all contaminants away from the operating table to keep the area clean. Both scenarios are achieved by controlling to a correct pressure gradient setting. The correct mixture of exhaust and/or return air, outdoor air and supply air are critical to system and building performance.

Hygiene

We can effectively contain, remove, or prevent contaminants from entering or leaving a space, but what do we do with the contaminants? Filtration is used to keep our systems clean. We all know this but what does it have to do with the test and balance? Setting a system correctly involves the testing of loaded filter pressures, to activate the dirty filter maintenance alarms. The building manager needs to know when he needs to schedule a service request for filter changes. This is set by the Controls contractor through the building management system (BMS). The BMS system is also setup so that the loading of filters triggers a response by the HVAC system to maintain the correct airflow to each space, by simply increasing the speed of the fan.

All of these essential steps are carried out by the TAB contractor and provided to the Controls contractor.

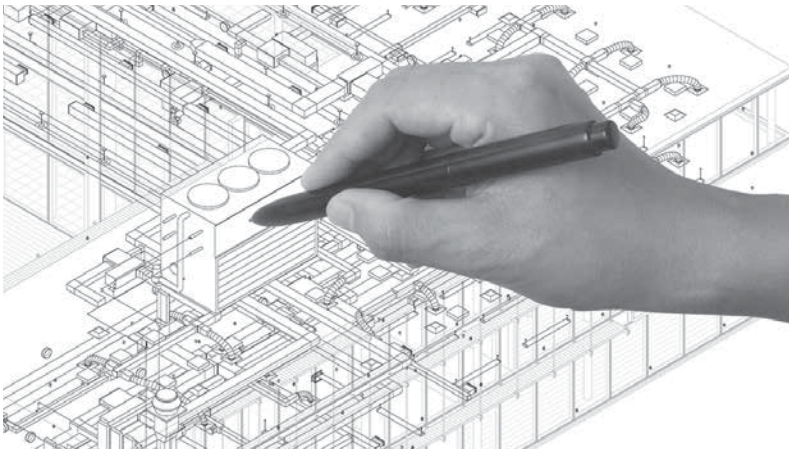
KEY FINDINGS

Are you getting what you paid for?

A sad fact in the construction industry is that we live in an age of price driven decisions. Quality is one of the last things considered when designs are submitted. "Value engineering" is more common and is essentially a cost reduction exercise. The cheapest price wins on installation and commissioning exercises. Many deficiency issues found during the testing process of the project are just swept under a very lumpy rug.

Quality Assurance

The Construction industry is aligning with organizations that simply cannot control quality. They do not police it and they have no contingency plan for it. This has opened the doors to poor practices and enables this very practice to thrive.



Compression of Schedule

The construction industry has further complicated the building process by consistently compressing the construction schedules to unachievable time frames. The processes that must be in place are either lost through a "corner cutting" process or often left out altogether.

CONCLUSION

There are plenty of NEBB Certified Firms, NEBB Certified Professionals & NEBB Certified Technicians all over the world. As a Building owner, occupant or even a contractor in the construction process, you shouldn't settle for less! The costs may vary slightly up front, but you never win or lose a job on the test and balance contract. To truly know that you are getting what you have specified and are paying for, you can trust and rely on a NEBB Certified Firm to assure quality during every task. NEBB Procedural Standards are second to none.

Key Takeaways

- Always specify NEBB in your contract documents
- Ensure the specifications are followed throughout the project
- You want your TAB firm to start as early as possible on the project
- Close monitoring of system design, installation and setup are essential ●

Sound Rating Criteria for Buildings

By Tarek Omar

The main goal for acoustic design in a space is to keep the background noise levels low enough that normal sound in the space. Example: concert halls tend to need the quietest levels to allow people to hear the intricacies of the different instruments.

Before determining, the appropriate sound level for any space, discussion and understanding of the various ways of measuring sound is a must. It is not as simple as saying the sound in a bedroom should be 30 dB or lower. There are many different measurement methodologies for different conditions. In the next few lines, we can summarize some of the different measurement methodologies:

First, we need to be familiar with two terms:

1- Sound Power Level (L_W) which is the total acoustic power radiating from a sound source.

2- Sound Pressure Level (L_P) which is the acoustic pressure at a point in space where a listener ear or microphone of a sound level meter is located

Both sound power and pressure levels are represented in Decibels (dB). Sound pressure levels are measured, and sound power levels are calculated from the measured sound pressure levels.

For Sound Power Level:

L_W (dB) = 10 Log (W (watts) / W_{ref} (10^{-12} W)

For Sound Pressure Level:

L_P (dB) = 20 Log (P_{rms} (Pa) / P_{ref} (2 x 10^{-5} Pa)

Sound pressure levels, whether measured outside in the environment or inside a building space, are used to determine loudness of sound(s), and then used to

determine compliance with building design criteria, building tenant expectations or local noise laws.

Keep in mind that sound pressure increases on a logarithmic scale. As a general rule of thumb, a change of 10 dB means the sound is perceived to be twice or half as loud. Humans can just barely detect a 3 dB sound level difference. They can easily detect a 6 dB change in sound level under most conditions and a change of 20 dB is much louder or quieter.

Now, we can go through different methodologies of sound evaluation.

Actually, there are many methodologies of sound evaluation of spaces; we need to know the differences between them, which method is used under what condition, and for what specific purpose:

1- A weighted dB(A)

dB(A) is simply a filter that adjusts decibels for the frequency range that the human ear is capable of hearing, which is 20 Hz to 20kHz. With the most important frequencies in the 250 Hz to 8kHz range.

This is highly limited as a diagnostic tool because all spectral information is eliminated during measurement.

2- Noise Rating [NR]

Noise Rating curves have been the international standard for indicating acceptable sound levels within a space. NR curves were developed by the International Organization for Standardization (ISO.) Each curve depicts the acceptable dB levels across a range of frequencies between 31.5 Hz and 8,000 Hz (8 kHz).

3- Noise Criterion [NC]

Noise Criterion was developed in the 1950s and was most often used in the United States to depict the acceptable range of background noise in a space. It is measured in the range of 63 Hz to 8000 Hz (8 kHz).

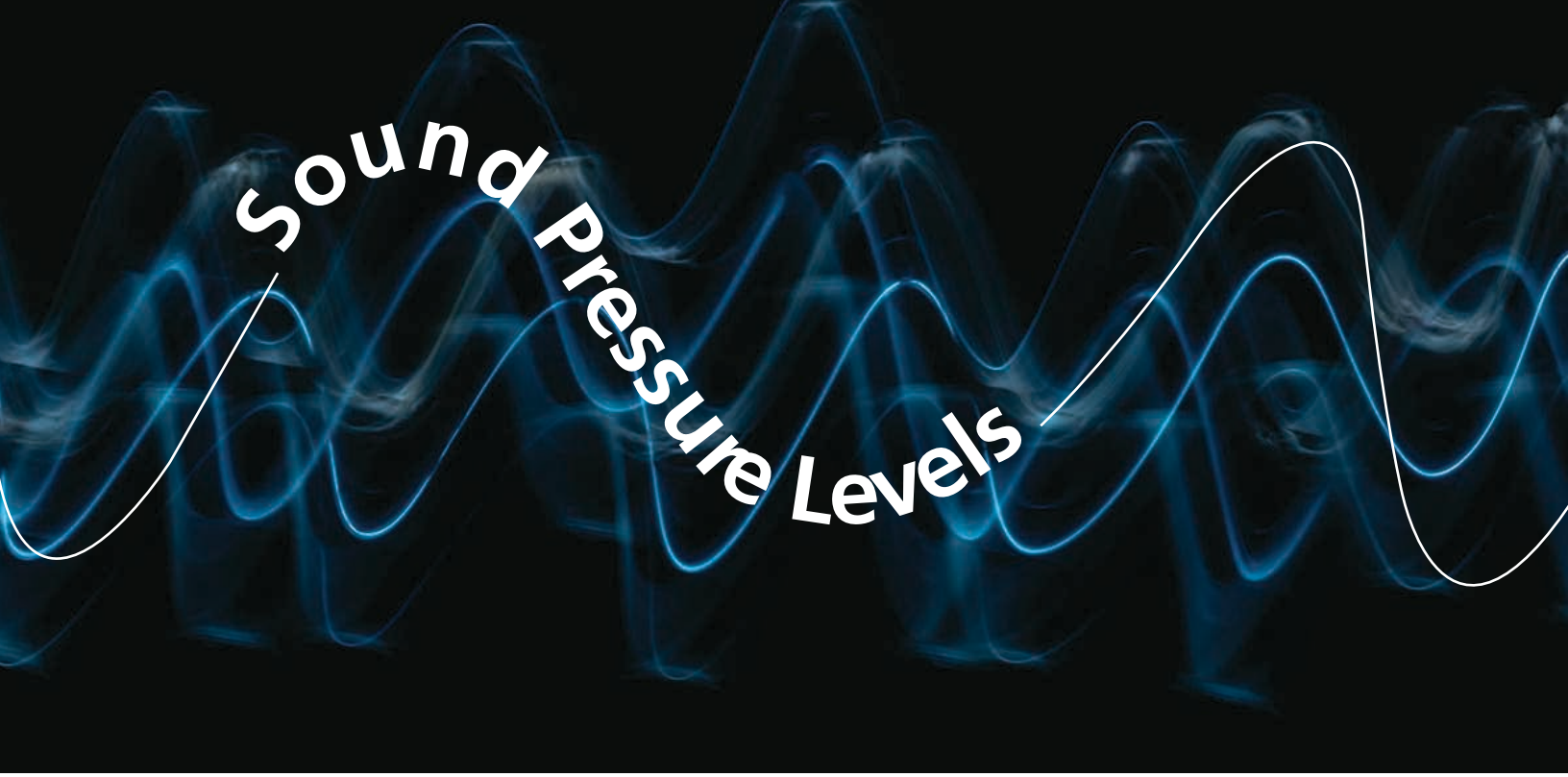
NC method was limited in that the curves used for evaluation/design did not extend down to low frequencies, where most HVAC system rumbling occurs. A room with a low noise level but a rumbly or hissy spectra can be just as bad as a noisy room.

4- Room Criteria [RC]

Room Criteria is an alternative range of allowable background noise in a building or room that was developed in the 1980s. It is measured in the range of 16 Hz to 4000 Hz (4 kHz). Like NC, RC takes into account the general "hum" of the building, and the RC looks at sounds in lower frequency ranges to account for rumbling of HVAC equipment. RC are depicted with straight lines of constant slope, which were observed to be the average spectrum seen in office buildings in the 1980s.

The RC system was developed response to LF (Low Frequency) and HF (High Frequency) noise problems

Room criteria measures have been developed to evaluate existing background noise levels in rooms as well as to specify required levels for rooms to be constructed, from HVAC equipment and other noise sources.



Also, the Room Criteria are also often used for diagnostics of faulty equipment.

5- Balanced Noise Criterion [NCB]

The new Balanced Noise Criterion curves, updated in ANSI S12.2-2008, accounts for sound frequencies down to 16 Hz, which will address issues from the low-frequency hum of energy efficient HVAC equipment. NCB also reduces the higher frequency levels to eliminate hiss.

6- RC Mark II

This criteria is an improvement to the original Room Criteria. It is almost the same as RC, except that it takes into account the subjective response of room occupants to vibrations of very low frequencies, which are often caused by HVAC equipment. It was developed in the late 1990s.

CONCLUSION:

As a conclusion, Room Criteria measures have been developed to evaluate existing background noise levels in rooms as well as specify required background levels for rooms to be constructed. Criteria are also often used for diagnostics of faulty equipment, as well as it is a way to identify sound quality.

With RC and RC Mark II ratings, the subjective quality or character of the background sound descriptors are defined as follows:

Neutral (N): Noise that is classified as neutral has no particular identity with frequency.

Rumble (R): Noise that has a rumble has an excess of low-frequency sound energy. If any of the octave band sound pressure level below the 500 Hz octave band are more than 5 dB above the RC curve.

Hiss (H): Noise that has an excess of high-frequency sound energy. If any of the octave band sound pressure level above the 500 Hz octave band are more than 3 dB above the RC curve.

Tonal (T): Noise that has a tonal character; usually contains a humming, buzzing, whining, or whistling sound. When a background sound has a tonal quality, it will generally have one octave band in which the sound pressure level is noticeably higher than other octave bands.

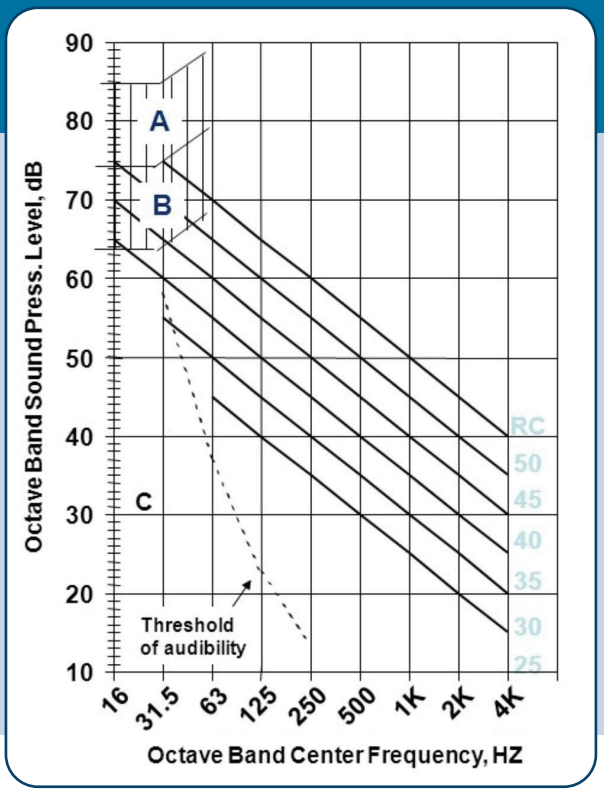
Acoustically induced perceptible vibration (RV): The crosshatched region of the RC curves indicates the sound pressure level in the 16 Hz to 32 Hz octave frequency bands at which perceptible vibration in the walls and ceiling of a room can occur.

If the background noise has any one of the above cases, place one letter or more of (R), (H), (T), (RV) after the RC level. In case of neutral noise add (N).

Room Criteria (RC) Curves

REGION A
High probability that noise-induced vibration levels in light wall and ceiling structures will be noticeable. Rattling of lightweight light fixtures, doors and windows should be anticipated.

REGION B
Moderate probability that noise-induced vibration will be noticeable in lightweight light fixtures, doors and windows.

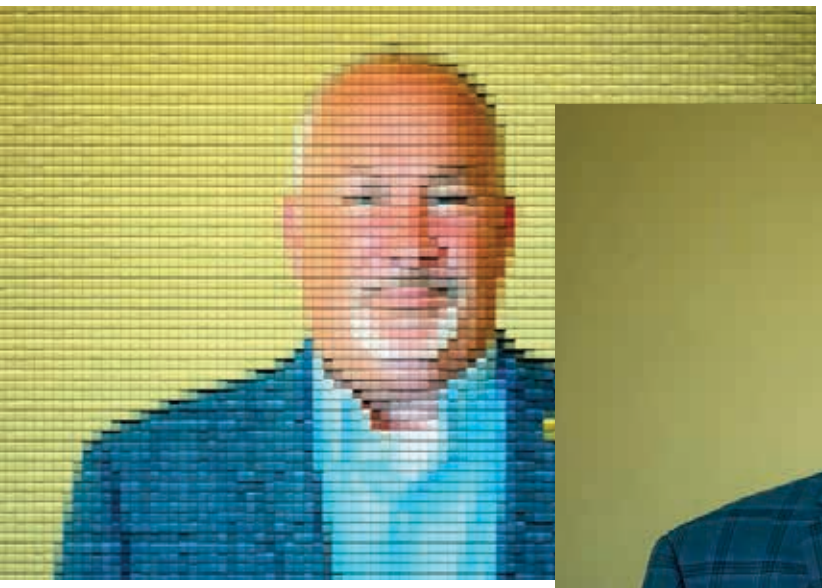


Adapted from 2009 ASHRAE Fundamentals Handbook - Atlanta, GA

The values below come from a variety of sources around the internet and in published books. *ANSI S12.2: American National Standard Criteria for Evaluating Room Noise* serves as the basis.

ROOM/SPACE	DBA	NR	NC/NCB	RC/RCM2 (N)
Theaters, Concert Halls, Recording Studios	25-30	20	10-20	20
Bedrooms, Libraries, Religious Prayer Rooms	25-30	25	20-25	25
Living Rooms, Classrooms, Lecture Halls, Conference Rooms	30-35	30	30-40	30
Offices, Courtrooms, Private Work Rooms	40-45	35	30-40	35
Corridors, Open Offices, Bathrooms, Toilet Rooms, Reception, Lobbies, Shopping	45-55	40	30-40	40
Kitchens, Shopping, Common Spaces, Dining Halls, Computer Rooms, Workshops	45-55	45	40-50	45

It's valuable to say that you cannot convert from one methodology to another as number, but you need to calculate the value from raw data.



Meet Our New Technical Director: **Jeffrey Schools**

By Kerri Souilliard

We have watched NEBB continue to grow over the past year, not only in size but in key initiatives, as well. Along with many valued volunteers, NEBB staff is essential to NEBB's ongoing activities. NEBB's Technical Director position, recently filled by NEBB Past President Jeffrey Schools, plays a fundamental role in many of NEBB's most discussed initiatives. With experience on the Board as well as chairing and serving various NEBB committees, such as Chapter Affairs, YPN, and TAB, there's no doubt he's the right person for the job. Get to know NEBB's new Technical Director in his own words below.

When did you begin as NEBB's new Technical Director?

I'm in the office now! My new role was announced at the 2021 NEBB Annual Conference, and I started on November 1, 2021.

Why were you interested in this role?

I always saw the need for a Technical Director from the BOD perspective and I've seen how hard it has been to fill this position. Someone had to do it, so I figured why not me. I know what we want at NEBB and what we need.

What's the biggest difference between this role and your previous position?

In my last role at Fisher Balancing, I was a Vice President and knew what I would be working on because I set the pace. Now, here at NEBB, it's exciting because I never know what's going to come up next. I constantly get to help people and answer questions. I've always been passionate about the work NEBB does, so it's very exciting.

As Technical Director, what matters most to you?

I'm just thrilled to be in this position. Moving NEBB forward is the only thing that matters to me. I'm happy this opportunity was available and whatever I can do to help, I'm up for the job!

What are some of your immediate initiatives at NEBB?

As soon as I got on the job, I started calling the contractors about NEBB TEC. I talked to the general contractor and sheet metal guys and told them to get crews in here, and that they had to get it done. My job hinges on it. So, we got things going again, and now we just need the equipment donations or deeply discounted—whatever we can get.

NEBB TEC is really essential for quality seminars and hands-on learning, so that's the goal. I really enjoy getting to know and engage with participants in that setting. I want everyone instructing seminars and attending seminars to know I'm here to help. I'm approachable. If you need anything, I'm here for you!

How about your other responsibilities? What do those include?

When technical questions come in, it is my job to help answer them. If I do not know the answer, I'll find it.

I collaborate closely with the technical committees. They add me to email lists and calls for support if they need me to facilitate. I assist however they need. If they are rewriting Procedural Standards, I help to coordinate, write and edit.

Recently, I sat in on a Zoom call for the NEBB app. The Committee went through Formula by formula, we need to ensure its accurate and efficient to use.

I also work closely with NEBB's publication team on The NEBB Professional, reviewing technical articles.

And you are involved with Title 24 Certification, too?

Yes, I am! Again, I am here to help answer questions and to help steer anyone in California in the right direction.

Wow, you are working on a lot of initiatives. Is there anything else we have not covered?

I am involved with instrumentation. We have everything in Certelligence now, but there is still a lot involved in instrument audits. For example, TAB must submit the name, model number, instrument number and calibration sheet for each instrument—and there are 12 different instruments alone for TAB.

I will also be working with Samantha Hawa on the NEBB Learning Center. I am responsible for giving more course content for online educational presentations.

Overall, what is your wish for the future of NEBB?

NEBB is the premier organization for certification, and my wish is that we continue to exist as such in the future. Nobody can hold a candle to what we do, the integrity of NEBB work speaks for itself, and I want this to continue to be the case for both firms and individuals.

Introducing the NEBB Learning Center

By Kerri Souilliard

As part of NEBB's 50th anniversary last year, you may have noticed that the NEBB website was completely refreshed, reorganized and updated with various new sections and tools for users. One particularly new area to pay attention to is the NEBB Learning Center, which is exactly what it sounds like: the central place to learn with NEBB online.

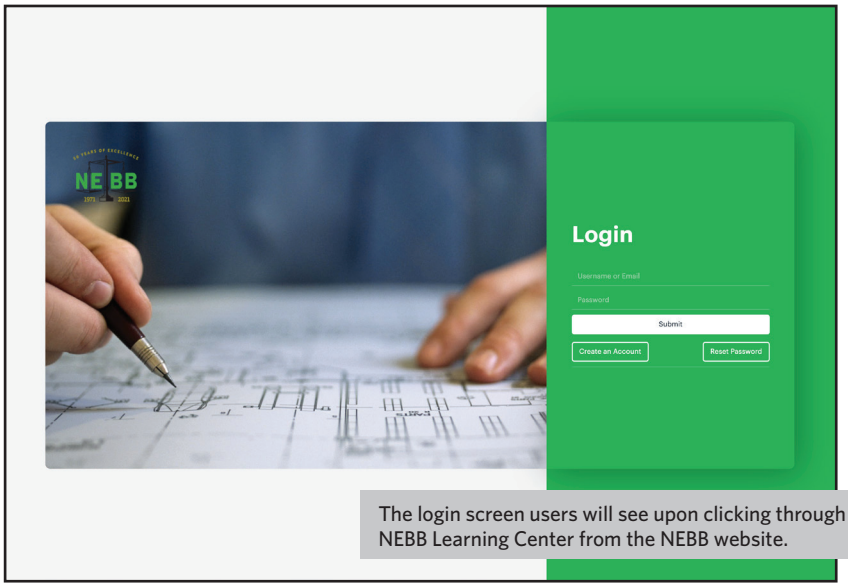
The NEBB Learning Center, or NLC, was officially introduced at the 2021 NEBB Annual Conference held in Kapalua, Hawaii in October.

"As the hub of NEBB online learning and training, the NLC allows for all types of educational content. Each committee will have the ability to upload individual courses and lessons," explains NEBB Online Training Coordinator Samantha Hawa. "These courses can consist of various resources such as PDF files, PowerPoint Presentations, videos, and word documents. The lessons in the NLC will also be interactive where users can take quizzes or knowledge checks after they watch a video or a power point presentation."

By means of a unique login (which can be generated by request), each user will be able to access the NEBB Learning Center platform hosted by Tovuti. Once logged in, users will immediately see a dashboard with featured video suggested by NEBB. Using the menu of the left side of the page, users can then easily access other pages such as Courses, Media Library, Learner Checklist, Community, Events, and My Profile.

The Courses tab allows user to explore available courses, including searching by NEBB discipline. Upon selecting a course, users can find related details like instructors, lessons, and pricing information. If you have

ever taken a NEBB seminar previously, you will note that many lessons include the same quality NEBB PowerPoint Presentations used in in-person learning—now with voiceover explanations instead. As users work through the lessons, a graphic gauge illustrates the percentage of the course that has been completed. Depending on the content on the NLC, learners/users might also have the opportunity to earn CEC's.



The login screen users will see upon clicking through to the NEBB Learning Center from the NEBB website.

Moving on to the Media Library, users can search media by category, media type (including audio, video, PDF, or website), or search terms. Media is simply clicked and viewed within the same screen.

The Learner Checklist section offers a visual snapshot of all the Badges and Certificates a user has achieved, as well as a Leaderboard to view the community's most active members. Directly underneath, a Checklist tracks items that are Due Soon, Courses, Awards, Events, and Videos, amongst other things. On the righthand side of the page, Course Progress outlines the user's courses, including the date started and current percentage of progress.

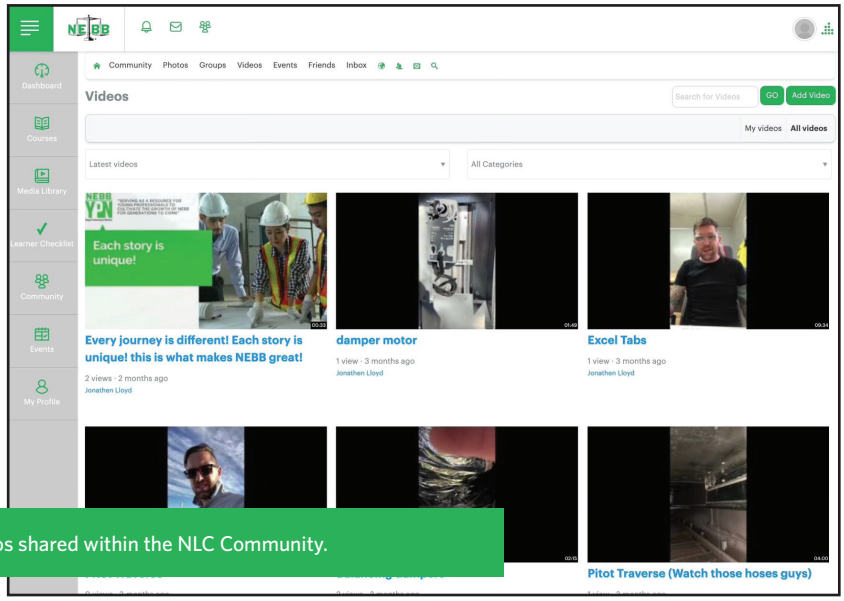
Within the Community section, which acts like a simplified social media platform, users can share a status, photo, or video. By adding friends or accepting friend requests, users grow their community. This is also a place to join or add events and groups, as well as privately message a connection.

A scroll over to the Events page reveals a snapshot of upcoming events, searchable by category or keyword.

Finally, My Profile offers a shortcut to sharing a status, photo, video, or event, as well as an opportunity to fill out an About Me section. In the latter, users can add personal information, change avatars, add profile videos, view notifications, and adjust preferences, such as privacy settings.

"It sounds like a lot to explore until you've entered your username and password and see that everything's pretty intuitive. And I'm always here to help!" Hawa concludes.

Anyone with questions concerning the NEBB Learning Center can direct them to Samantha Hawa, NEBB Online Training Coordinator at samantha@nebb.org. ●



Videos shared within the NLC Community.

WAR STORIES

By Robert Shorr

Asking your general contractor to cut open a finished atrium wall two days before the building's grand opening is not a request anyone wants to make—which is the exact reason NEBB Professionals need to learn how to do it.

You can learn a lot in educational seminars, but one thing most professionals don't know until they encounter it, is how to navigate important processes with contractors. After all, confidence is not necessarily something you are taught.

For example, if you find something needs to be done that could cost somebody else thousands of dollars, it's important to have enough confidence in your skills, tools, and troubleshooting techniques to, without a doubt, stand up and make the right thing happen. Having been in the business this long, I've had enough experiences to prove the value of standing up against persuasion and not taking shortcuts. To veteran TAB firms, these processes may feel familiar.

Sometimes, a general contractor or owner with a tight timeline may ask you to bend a little on the integrity of your report. When the Certificate of Occupancy depends on it, you can get pressured to submit a positive report. If things are not up to design specifications and requirements, it can be a challenging, *but necessary,* conversation to be had.

In order to preserve the integrity of your report, you cannot let anyone convince you to give a good report just to make a deadline. You don't want to compromise the integrity of the work you're doing, plus it could create problems down the line for owners. In the moment, such an act may not sound that harmful, but it's your job to remember what could happen as a result. It's your reputation on the line.

NEBB requirements are pretty simple. We follow the specific requirements and that's it. If there's an issue, we are required to identify it in the report.

When we're the last ones in and it's the last minute, contractors simply want to get the building open, so they want the report. Finding issues this late is what makes those conversations difficult to be had.

The following war stories help illustrate the importance of integrity, confidence, and static pressure:

Grand Opening

One particular project experience I can recall was a 14-story condominium. It was the week before the building's grand opening, and we were balancing the common area in a big open atrium and couldn't get airflow below the eighth floor.

In this case, the air was going down a fire rated chase and fire rated assembly, then being distributed to each floor—basically, interior balconies opening to a big atrium. By measuring some static pressures in the ductwork through the fire access dampers, we found no static pressure below the eighth floor, meaning something was blocking the duct. We put a camera on a cable in one of the access doors to lower it down into the ductwork and try to find what was blocking it.

The camera showed something blue. It turned out to be a big, rigid piece of Styrofoam that they use for the roof. Apparently, somebody had set it on top of the duct on the roof (maybe to cover it up for rain or something), but it got knocked into the ductwork and fell six floors until the duct narrowed and then sat, wedged in the ductwork. It was something that obviously happened early in the project when they were doing the roof and the duct was exposed on the roof.

The camera certainly helped, but it was really the static pressure reading that saved the day. Static pressure will tell you exactly what's happening inside the ductwork without you being able to physically see it.

After identifying the issue and finding the location, the problem was that we were only one week out from the grand opening of this facility. I had to convince the general contractor to cut open a firewall, cut open the ductwork, and get this piece of Styrofoam out so we could get out and finish the job. Obviously, the general contractor would rather we didn't cut the wall open before the grand opening; they just wanted a good report. You must have a relationship in which both parties understand your responsibility is to ensure the report is within specifications, or issues will be identified—there's no compromise.

The camera certainly helped, but it was really the static pressure reading that saved the day.

If a contractor says, "Just give a good report and we'll take care of it after the grand opening," my response would be, "No, I'll log it as a deficiency, or you can cut it open and fix it, and we'll balance it, and then you'll get a good report." That's what I mean when I say follow our standards, which requires us to do it within a certain tolerance and note any deficiencies. We need the confidence in our findings to be able to challenge the building owners, contractors, or anybody in the chain when we identify an issue. These issues need to be taken care of, and unfortunately, sometimes it costs a lot of money for them to fix it—especially at the end of the job.

Historic Renovation

We faced a similar situation with a historic renovation of a two-story courthouse building. While looking at the exhaust fan on the roof, which fed the restrooms on each floor, we noticed plenty of airflow on the second floor, but no air flow on the first floor.

Trying to get a closer look, we put the camera into the access door and took pictures. This time, however, we could not see anything in the straight run of ductwork that went down. By accessing the ductwork to take some static pressure readings, we were able to determine that there was no airflow on the first floor.

Again, I had to convince the general contractor to cut open a wall to access this ductwork. Once inside, we found clear plastic covering the end of the ductwork. The clear plastic had been there before the assembly and was never removed when the two sections were assembled.

In this case, static pressure identified the issue; the camera didn't see it.

Even though it's one exhaust grille, let's say 50 cfm, it is our job to identify the issue no matter what. We can't deviate from our NEBB requirements, and the specifications and the drawings to give a good report.

There was a lot of pressure on me to just give a good report. I had to be ready to respond to, "It's only 50 cfm and we'll take care of it later." Had I done that and allowed them to go on to do the grand opening, there's no way they would want to cut that wall open later. And if I had caved and already given a good report, I'd have absolutely no argument for them to follow through if they already have something in writing that says it's fine. That's a shortcut to putting yourself in a bad light with NEBB and anybody else. However, if you're prepared to have those hard conversations to address issues, and it will be much easier to uphold your integrity.

The moral of the story is that static pressures won't lie when it comes to your duct, air flow, or the ability to get airflow throughout the system. Secondly, have confidence in what you're doing and how you're doing it. Make sure you are comfortable and confident, and you're communicating with somebody that will listen when you're telling them they must do something that's going to cost money, or time. It's our job to ensure the job is done right and you can't waver from that. In the end, your reputation will be better because of it. Although it may cause somebody some heartache and some money for a little bit, people will respect your firm and your opinion. They'll know that when you identify an issue, it's due to proper training and experience, so they'll get it fixed promptly without any issues.

Plus, when they get a TAB report at the end, the warranty period should be very easy because the TAB firm has already found all the issues that could possibly come up. Let's say I didn't catch the exhaust on the first floor of that courthouse, or just gave a good report. It could have been six months later, after occupancy, and all the of the sudden, they would get constant complaints about odors in this bathroom. Then, they would have to figure out why, and because they had received a good report that says the exhaust is fine, that would be one of the last things checked. No one wants to be left chasing their tail, trying to find the issue. ●

Three things to remember:

1) Static pressure doesn't lie.

2) Don't let anyone convince you to compromise the integrity of your work.

3) Appeasing other parties with a good report just to meet their timeline can cost you a lot.

TheTOOLBOX

Environmental Systems Technology

By Jeff Schools, NEBB Technical Director

If you're working in this industry, it would be hard to believe that you have never heard of the *Environmental Systems Technology* publication. Sometimes referred to as the "Balancing Bible," this book's first edition was originally published in January 1984 by W. David Bevirt.

W. David Bevirt

Mr. Bevirt became involved with NEBB in 1972. He served as co-administrator in 1976 and handled all financial and technical activities. He was a Board of Director from 1976-1993, the Technical Director and later he became the Director of Research for NEBB. While writing this book, he was also completing the *Procedural Standards for Testing, Adjusting, and Balancing Environmental Systems*. In 1986, he was involved in the completion of the Testing, Adjusting, and Balancing Manual for Technicians. A manual that is a highly regarded tool for training testing, adjusting, and balancing technicians. It is also a comprehensive reference source that is still used on many TAB projects today. This manual is in it's Third Edition and has been updated in 2021 to include the most current technologies in HVAC systems. This new information will help to educate and advance TAB technicians worldwide to a higher level of knowledge and expertise.

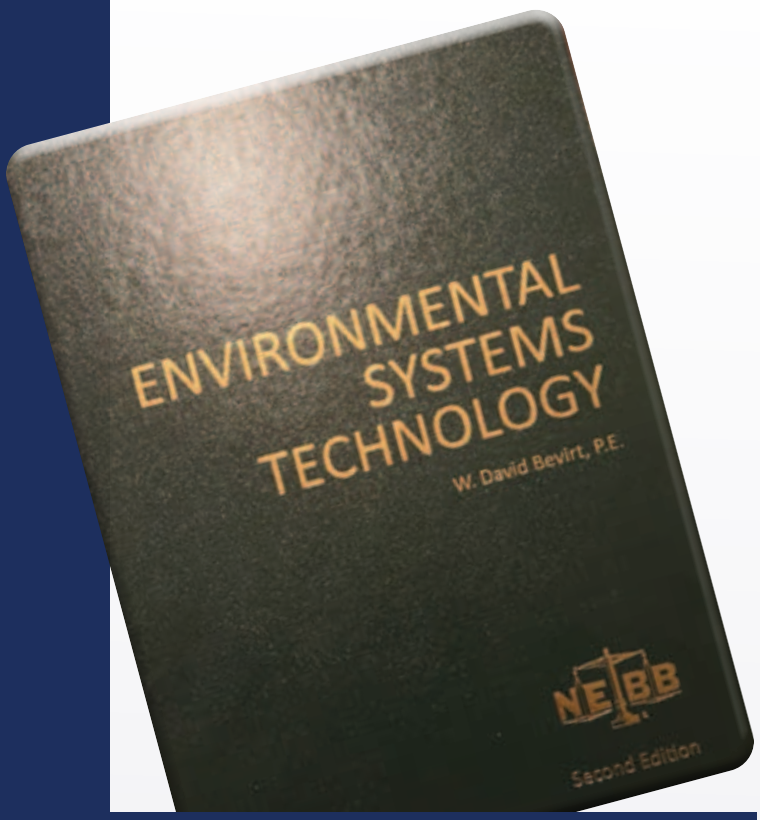
THE SECOND EDITION

The *Environmental Systems Technology* Second Edition was published in October of 1999. Leading the charge for this Edition was again W. David Bevirt, P.E. along with members of the TAB Committee. The TAB Committee Members, Robert M. Bolton, Joseph E. Miller, Martin A. Cirillo, Ted Salkin, Al Fudge, George Theisen, and Stephen E. Holzinger worked diligently under the direction of Board President Fred Menger and his 12 Member Board to update and make current the basic and fundamental knowledge of all phases of environmental or heating, ventilating and air conditioning (HVAC) systems.

In this Second Edition, the first 5 Chapters are basically the same as the First Edition. In these Chapters, Chapter 1-The History of HVAC encompasses the history of heating and ventilating from a crude campfire to the development of true air conditioning using psychrometrics. Chapters 2-Fundamentals, 3-Psychrometrics, and 4-Building Heat Flow contain basic heat flow and psychrometrics. Regardless of the relationships people may have with environmental systems, they must remember that the systems are installed to benefit the occupants of the conditioned space and Chapter 5-Human Comfort covers many of these physiological aspects.

Chapter 6-HVAC Fans and Chapter 7-Duct Air Distribution Systems you will find the basic fundamentals, design, and construction of air systems.

Chapters 8 – Hydronic Pumps and Chapter 9 – Hydronic Systems cover hydronic and steam flow principles.



Chapter 10 – HVAC Systems and Equipment and Chapter 11 – System/Building Relationships cover exactly what their titles read.

Chapter 12 – Electrical Systems Motors and Drives contains electrical fundamentals as well as information on motors, drives electrical power and electrical systems.

Other systems covered in this Edition are Chapter 13 – Automatic Temperature Control Systems, Chapter 14 – Refrigeration Systems, Chapter 15 – Combustion Systems, and Chapter 16 – Energy Recovery Systems.

Chapter 17 – Cleanroom Systems is one of the new sections in this Second Edition. This information was taken from the then current "Procedural Standards for Certified Testing of Cleanrooms".

Chapters 18 – Testing, Adjusting, and Balancing and Chapter – 19 TAB Procedures contain updated information and procedures that have changed since the First Edition. Chapter 19 even contains TAB Report Forms. The thought behind this was that these forms, both as work sheets and as a final report of operating conditions, will provide the best method to ensure that the testing, adjusting, and balancing is being correctly, systematically, and effectively performed.

Chapter 20 - HVAC Acoustics contains new information and other viewpoints about environmental acoustics.

Chapter 21 contains most of the engineering tables and charts that would be needed to design or size all or part of environmental systems.

Chapter 22 contains examples of problems with solutions concerning air and water flow, heat transfer, and psychrometrics.

Chapter 23 shows system trouble shooting examples using actual case studies.

Finally, Chapter 24 contains an extensive glossary and Chapter 25 is the text index.

This Second Edition was written to provide both the experienced and novice HVAC system designer, HVAC system installer, TAB technician or TAB supervisor with a practical and easy to use text on environmental systems and their applications.

The Second Edition was spearheaded by W. David Bevirt along with members of the TAB Committee. At the time, NEBB had a totally different make-up. We were the National Environmental Balancing Bureau with everything being related to Testing and Balancing. Now NEBB consists of 8 disciplines: Building Enclosure Testing, Commissioning, Cleanroom Performance Testing, Fume Hood Performance Testing, Retro Commissioning, Sound Testing Vibration Testing, and Testing Adjusting and Balancing.

THE THIRD EDITION

Moving forward with the publication of the Third Edition of the *Environmental Systems Technology* textbook, there is a lot of new information that needs to be added. The 22 years since the last update has seen many advances

Moving forward...

in the industry and more detailed NEBB Disciplines and Procedures that deserve a place in this update.

I see the Third Edition being written with the TAB Committee and all the Technical Committees to ensure that we include the latest information pertaining to each discipline. As in the Second Edition, we would keep the first five Chapters the same with maybe some minor tweaking where we see the need. In Chapter 1, we will still include the history as written in the second publication. Also, Chapters 2 through 5, Fundamentals, Psychrometrics, Building Heat Flow and Human Comfort will generally stay the same with minor changes where we feel they are needed. Chapters 6 through 16 and Chapters 21 through 25 will need to be reviewed by all of the Technical Committees to see if there is anything that needs to be changed or added to bring the information up to date. Chapter 17, Cleanroom Systems will be under review by the Cleanroom Performance Testing Committee. They will make changes and updates to bring the discipline up to date. Chapters 18, Testing Adjusting and Balancing and Chapter 19, TAB Procedures will be handled by the TAB Committee and Chapter 20, HVAC Acoustics will be the work of the Sound and Vibration Committee.

The new chapters that will be added include Building Enclosure Testing, Fume Hood Performance Testing and Commissioning, which will cover Whole Building Technical Commissioning of New Construction and Technical Retro-Commissioning of Existing Buildings. These Chapters will be written with the guidance of the Technical Committees for which they are named.

The Third Edition of the *Environmental Systems Technology* publication has been a long time coming and I am very excited to work along with NEBB's great volunteers to put this process in motion. By working together, we will be able to provide valuable up to date information on Procedures and Standards used by all the NEBB Technical Committees to carry them into the future. ●

Chapter News

Southern California EBB

James Rosier, Chapter Coordinator

Friday January 21st 2022, Southern California experienced a Santa Ana wind event which proved catastrophic for certain cities. Wind gusts clocking in at 90 mph caused devastation such as falling trees and downed power lines throughout many of the foothill cities. On Saturday the 22nd, Southern California's chapter of NEBB had a scheduled CP practical exam, with 3 candidates scheduled to take the test. When the proctors started showing up at 6 am, it was evident that our San Dimas test lab had been adversely affected by the winds, as we found the building, along with most of the city of San Dimas to have no electrical power. All the candidates testing were from out of town and rescheduling was not an option, so the team went to work.

Chapter Coordinator Jim Rosier and President Erik Dlugajczyk (Equal Air Balance Company) devised a plan to move forward with the testing under adverse conditions. The plan consisted of Jim Rosier and proctor Nick Cox (Precision Air Balance Las Vegas) going to Home Depot to purchase a generator as well as gasoline to power the generator, while proctors Mike Sanderson (Western Allied) and Roman Zaretsky (Zaretsky Engineering Solutions) went to work handwriting the sheets necessary for the exam.

The exam started 45 minutes late but finished without a hitch. The team sprang into action, everyone playing a crucial part, and all 3 candidates were able to finish the test with no adverse conditions. Power was not restored to the city for another 30 hours after the start of the test, but the Southern California Chapter created a contingency plan to move forward with in case of any natural or man-made disasters so as to not affect those who are trying to better themselves and better NEBB.

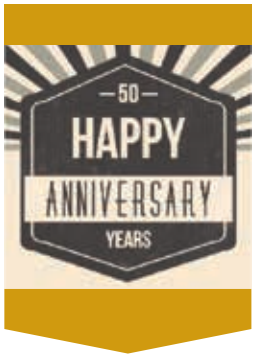
Southern California's chapter of NEBB demonstrated its commitment to the CP candidates and to NEBB by

keeping its promise to test even during adverse conditions. We hope that this experience helps other chapters with a blueprint of how to overcome challenging conditions in order to maintain a commitment to the candidates. Only by keeping our promises and commitments can we hope to keep NEBB the premier certifying association for firms and individuals who deliver high performance buildings and systems.

MAEBA Chapter

Trish Casey, Chapter Coordinator

MAEBA has scheduled their Semi-Annual Meeting on April 22, 2022, at the Radisson Hotel in Trevose, Pennsylvania. The seminar begins with lunch with the Vendors, followed by John Boyle of R. D. Bitzer Co., Inc. speaking on balancing a sensorless pumping system. Michael Kelly of Air Filtration Management, Inc. will also be presenting on biosafety cabinets.



MAEBA will also be holding their Annual Recertification Seminar September 18-19, 2022, at the Hard Rock Hotel and Casino in Atlantic City, New Jersey. MAEBA will be celebrating their 50th Anniversary at this seminar.

The Recertification Seminar will begin on Sunday evening, September 18th with a dinner reception at the Backstage of the Hard Rock Café. On Monday, September 19th, following the morning speakers, will be Dessert and Coffee with the Vendors. This is a great opportunity for MAEBA CP's and CT's to meet the Vendors that are part of the MAEBA Associate Program and learn about the latest and greatest equipment and software the Vendors have to offer.

Capital-MarVa International NEBB

Barbara Huber, Chapter Coordinator

Capital-MarVa held their 2021 Recertification Seminar on September 15th in Annapolis, MD with a few unique presentations including "Commissioning Grow Facilities" and "TAB and CX Efforts used to convert a convention center hall into COVID Alternative Care Facility". We had 112+ attendees and 6 vendors.

We are pleased to announce that our office is now open for Certified Professional Practical Exams. Our testing lab has been closed since March 2020 due to COVID and water damage to our office. We are currently filling exam spots with candidates that have been on the waiting list. Please contact Barbara Huber (301) 599-9450 if you would like to be added to the waiting list.

Annapolis Crowne Plaza Hotel

In lieu of NEBB's annual conference moving to the Fall, Capital-MarVa will hold their 2022 Recertification Seminar at the Crowne Plaza in Annapolis, MD on April 28th.

North Central NEBB

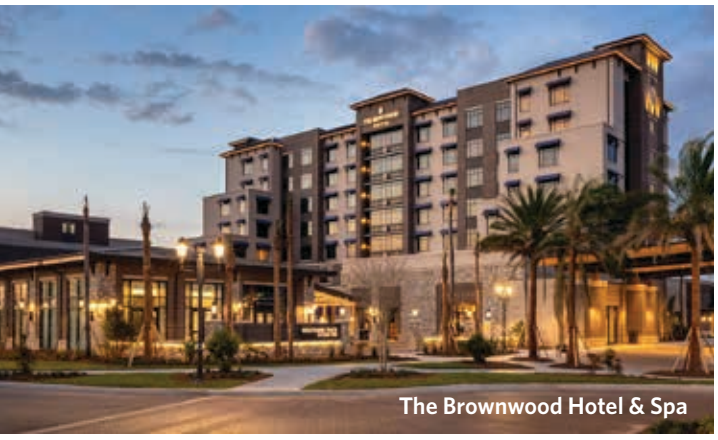
Ashley Lang, Chapter Coordinator

Our General Membership Meeting will be held on March 10th at the NEBB Chapter office in Brooklyn Center, MN. Discussion will be held on co-chairs, topics and speakers for our October 13th recertification seminar.

Florida Environmental Balancing Bureau

Terry T. Wichlenski, Chapter Coordinator

Florida EBB will be hosting their 41st Recertification Conference and Business Meeting at The Brownwood Hotel & Spa in The Villages, FL April 28-29, 2022. We will be welcoming Jon Sheppard, NEBB President and he will be providing two sessions (TAB Excel Forms & TAB Construction Project Managers) for our chapter. We also have Brent Baird speaking along with several other Speakers and Vendors. If you are interested in joining us please contact Terry Wichlenski, Chapter Coordinator for the Registration Form.



The Brownwood Hotel & Spa

Our next planned NEBB Practical Exams are being confirmed so please contact Terry at 727-240-4254 or febbchapter@nebb.org ●

2022 NEBB Technical Seminars Schedule

March 24 - March 28
IMI TA Balancing & Control Center, Rosewell, GA
Testing Adjusting and Balancing Seminar

April 4 - April 6 | NEBB TEC
Clean Performance Testing Seminar

April 4 - April 8 | Total Dynamic Balance, Deerfield, FL
Sound & Vibration Measurement Seminar

April 16 | Southern California
Southern California EBB TAB CP Practical Exam

April 25 - April 27 | NEBB TEC
Building Enclosure Testing Seminar

April 28 | Annapolis, MD
Capital-MarVa Recertification Seminar

April 28 - April 29 | The Villages, FL
Florida Environmental Balancing Bureau-Chapter Recertification Seminar

May 2 - May 4 | NEBB TEC
Commissioning CxCT Seminar

June 6 - June 7 | Labconco, Kansas City, MO
Fume Hood Performance Testing Seminar

June 9 - June 12 | NEBB TEC
Testing Adjusting and Balancing Seminar

September 12 - September 14 | NEBB TEC
Clean Performance Testing Seminar

September 15 - September 18
IMI Training Center, Irvine, TX
Testing Adjusting and Balancing Seminar

September 29 - September 22 | NEBB TEC
Commissioning RCx Seminar

50 YEARS OF EXCELLENCE
NEBB
1971 2021

For more details, go to www.nebb.org.

NEBB
8575 Grovemont Circle
Gaithersburg, MD 20877
USA

Are you looking for ways to keep up with NEBB and the latest updates, posts and seminars?

Follow us! Like us! Share us!

- NEBB Twitter
- NEBB LinkedIn
- NEBB Facebook
- NEBB YPN Facebook
- NEBB YPN LinkedIn

For any questions, please contact
communications@nebb.org

To update mailing address and to continue to receive *The NEBB Professional*, please send an email to communications@nebb.org.