The NEBB Professional

2025 – Quarter 1

Effective Ways to Market NEBB Commissioning and RCx Services

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President's Message

I hope everyone enjoyed a great start to the year and that you were able to spend quality time with family and friends. As we move into spring, I want to wish all of you continued success and prosperity in 2025. I am looking forward to a busy year, guiding NEBB to continued success as the premier certification organization.

The NEBB Board of Directors began the year by approving the strategic plan that will set the direction of the organization for the next three years. When developing the strategic plan, we included input from various stakeholders such as staff, NEBB volunteers, past presidents and chapter presidents to help identify the priorities and direction of the organization. We also performed a market and competitor analysis.

In conjunction with maintaining NEBB's mission, vision and core values, the four main strategies identified are:

1. Revamp and ignite the new marketing strategy for the NEBB organization.
2. Have the best training and education programs for the industry segments served.
3. Continuously update NEBB certification programs to ensure they are the industry reference.
4. Develop technical initiatives that will demonstrate leadership on new technologies and engagement with world class initiatives.

The strategic plan has been nearly a year in development, and the next challenge will be implementation, as there are a total of twenty-four action items within the four strategies. The NEBB Board of Directors will be responsible for ensuring the strategic plan is followed and the responsible parties for its implementation span the entire organization. The defined entities include the Executive Finance Committee, staff, technical committees, Compliance and Affairs Committee, Young Professionals Committee, Future Technologies Committee, chapter coordinators, chapter presidents, and the editor of *The NEBB Professional*.

I have stressed the importance of teamwork and the success of the strategic plan's execution relies on everybody on the NEBB team. I am looking forward to working with everyone and implementing our strategies throughout the year ahead.

I would also like to follow up on the articles by Tiffany Meyers and Jeff Schools in the last issue of *The NEBB Professional*. Jeff wrote about the industry networking NEBB does with our participation at industry conferences and trade shows, and Tiffany wrote about attending those conferences and delivering presentations or participating in panel discussions. This is important in maintaining NEBB at the forefront of the industry. Leadership and technical committee members are involved, but I would like to see further involvement from our NEBB Certified Professionals. It is important to attend national events, but there are also many local events which are truly the grassroots of the organization. We have some areas throughout the country where NEBB Certification is required in every specification, and some areas where NEBB is not specified at all. We need to get the word out and showcase the importance of NEBB Certification and why NEBB is the premier certification association everywhere.

We are gearing up for the 2025 Annual Conference, taking place November 6-8 at the Peabody Hotel in Memphis, Tennessee, and look forward to featuring a variety of industry leaders and forward-thinking professionals. Exhibitor and golf sponsorship opportunities can be found under the *News/Press & Announcements* tab on the NEBB website at www.nebb.org/news/.

I look forward to a busy and productive year and want to thank everyone for their support and dedication!

Mike Kelly
NEBB President

CONTRIBUTORS

Luke Bumgardner is a Project Professional specializing in MEP systems with a focus on mechanical and control systems. His professional passions are mission critical applications such as healthcare, laboratories, and compounding pharmacies. Luke enjoys anything outdoors, namely playing baseball, hiking, and climbing.

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Quinton Smith has worked in the TAB & Cx industry for 8 years, and is a NEBB Certified Cx Professional & TAB Technician. He is currently serving as a Chair of the NEBB YPN Committee.

Luis Chinchilla, 2024 NEBB Past President, is the Director for OPIA Operaciones e Ingenieria de Avanzada de Centroamerica S.A. He is a licensed Chemical Engineer in Costa Rica and holds NEBB certifications in TAB, CPT, Cx and BSC. Having served on the NEBB Board and committees, he has helped facilitate various NEBB initiatives at the chapter, committee, and national level.

Amber Kelly, 2020 NEBB Past President, is the TAB Superintendent at ACCO Engineered Systems, Inc. in San Leandro, CA. Her vital experience has led to important developments for both ACCO and NEBB. In addition to TAB, she holds NEBB certifications in Cx, RCx, and S&V. Outside of Amber's professional career, she enjoys traveling, family time, gardening and supporting her favorite football team the San Francisco 49ers.

William Bailey has been a member of NEBB since 1997 and a member of ASHRAE since 2003. William loves teaching classes related to HVAC for Associated Builders and Contractors and Service Group at NMC.

Jeff Schools is the Past President of NEBB and currently works with the NEBB Headquarters team, NEBB committee chairs, and Compliance members as NEBB Technical Director.

Letter from the Editor

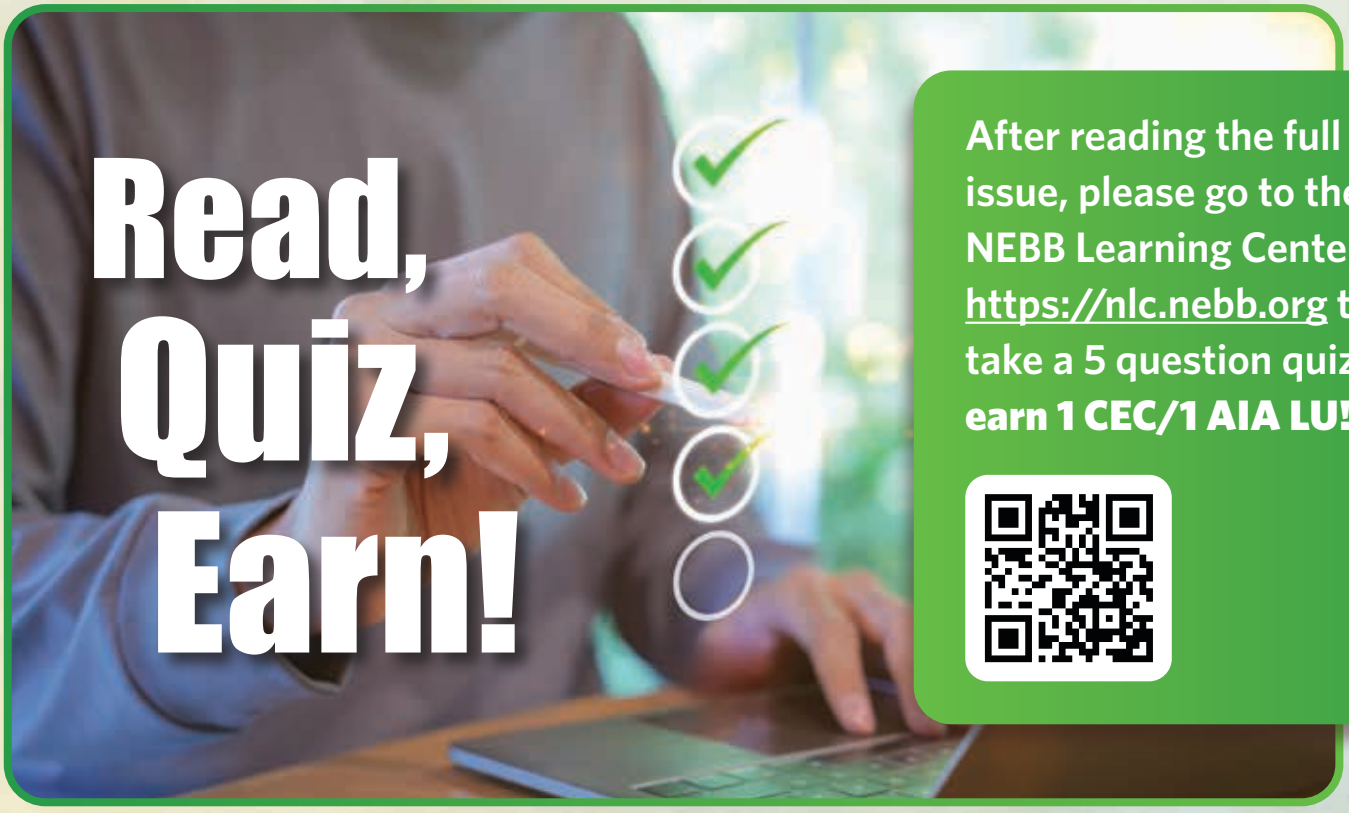
There's something special about this time of year—the invigorating energy in the air, fresh ideas coming to life, and that sense of possibility that's hard to ignore. We're entering a season of growth and rejuvenation, which brings with it increased clarity and renewed commitment to the goals we set out to accomplish this year.

As we ride this wave of forward momentum called springtime, it's the perfect time to consider the seeds we're sowing for the months and years ahead. This season of opportunity is an excellent time to strengthen the reputation of NEBB Certified Professionals and Firms, as well as elevate the whole industry by encouraging others to join in, too.

True industry influence isn't just about adapting to change—it's about shaping it with intention. By inviting owners, architects, and engineers to collaborate closely with NEBB, and expanding the role of women in technical positions, we're creating space for fresh perspectives and new solutions. When knowledge, technical skill, and integrity take center stage, the entire industry thrives. NEBB Certified Professionals and Firms know excellence and ethical commitment aren't just ideals, but essential in performing quality work.

Those who combine technical mastery with meaningful engagement will set the standard for what's to come. As we look to the months ahead, there's a chance to set the stage for a future defined by excellence, innovation, and meaningful change. In the words of Peter Drucker, "The best way to predict the future is to create it."

Kerri Souilliard,
Editor, *The NEBB Professional*



The Power of NEBB Certification: Marketing Excellence and Building Opportunities

By TJ Meyers, NEBB Executive Vice President

NEBB certification is not just a credential; it's a symbol of excellence, expertise, and a commitment to providing the highest quality across all eight of our specialized fields. But the true value of NEBB certification goes beyond just holding the title. It's about how we actively market it, communicate its worth to clients, and use it to open doors for future growth and opportunities. By highlighting the benefits of NEBB certification, we can expand our influence, increase demand for NEBB-specified projects, and elevate the entire NEBB community.

Achieving NEBB certification isn't easy, and it's something we should all take immense pride in. It reflects a deep commitment to mastering complex skills, keeping up with the latest standards, and constantly improving. For those of you who are NEBB certified, it's important to recognize that this certification truly sets you apart in an increasingly competitive marketplace. It gives us access to the latest technologies, the highest industry standards, and a proven track record of best practices.

But this distinction is only valuable when we take the time to communicate its significance to our current and potential clients. NEBB certification is an assurance to clients that they're working with someone who has not only met, but continually exceeds, the rigorous standards of the industry.

It's easy to assume that clients already understand the importance of NEBB certification, but that's not always the case. In fact, it's our responsibility to make sure that they do. Marketing the value of NEBB certification isn't just about promoting a credential—it's about showcasing the dedication and expertise behind it. When you take the time to share with your clients why NEBB certification matters, you're not only reinforcing the quality of your services, but you're also highlighting your commitment to precision, long-term value, and customer satisfaction. Let your clients know that NEBB Certified Firms follow thorough procedures, adhere to strict industry standards, and are committed to sustainability and energy efficiency in every project.

By marketing your NEBB certification, you're building trust with your clients and strengthening your firm's reputation. Clients who see the value of NEBB certified work are more likely to return for future projects—and refer your firm to others in the industry. This ripple effect is what helps grow both your business and NEBB as a whole.

One of the most powerful aspects of NEBB certification is the opportunity it provides to educate your clients. Many people don't fully understand the difference between working with a NEBB Certified Firm and one that isn't. It's up to us to help them see why that distinction is so important. Take the time to explain the thorough training, testing, and quality control processes that go into NEBB certified work. Help your clients understand how your work translates into better performance, increased energy efficiency, and long-term savings. When clients see how this attention to detail impacts their bottom line, they'll not only appreciate your expertise but also see you as a trusted advisor who's looking out for their best interests.

The more your clients understand the value of NEBB certified work, the more likely they are to keep coming back and recommending you to others. And the more NEBB Certified Professionals and Firms educate their clients, the more widespread the recognition of NEBB certification will become, leading to greater exposure and more opportunities for the NEBB community.

When you market NEBB certification, you're not just benefiting your firm—you're also increasing the visibility and reach of NEBB as an organization. Every time you share the benefits of certification, you're helping others understand what sets NEBB apart from the competition. The more clients and industry stakeholders recognize the importance of NEBB certification, the greater the demand will be for NEBB certified services. This creates more opportunities for all of us. As awareness of NEBB certification spreads, clients will seek out NEBB Certified Professionals for their projects, and more projects will be specified to NEBB Procedural Standards. Whether you're involved in commissioning, environmental balancing, or any of the services we of-

fer, the more clients understand the value of certification, the more likely they are to choose your firm for their upcoming projects.

One of the most exciting aspects of marketing NEBB certification is the potential to drive more NEBB specified projects. As more clients understand the significance of working with NEBB Certified Professionals, they'll increasingly request certified firms for their projects. This shift will lead to more opportunities, not just for individual firms, but for the entire NEBB community.

As more projects are specified to NEBB Procedural Standards, we all benefit. NEBB Certified Firms will have the chance to work on a wider range of projects, build stronger relationships, and help grow the industry as a whole. NEBB certification will no longer just be a mark of distinction—it will become a sought-after credential that clients look for when choosing partners for their projects.

I encourage all NEBB Certified Professionals, Technicians, and Firms to take an active role in marketing the value of NEBB certification. It's not just about promoting your firm—it's about contributing to the success of the entire NEBB community. By educating your clients, sharing the advantages of certification, and helping others understand the impact of NEBB certified work, you're raising the standard for the entire industry and creating more opportunities for growth.

As we all work together and continue to promote NEBB certification, we not only increase demand for our certified services but also strengthen the position of NEBB as the gold standard for testing, adjusting and balancing, commissioning, fume hood, cleanroom, sound and vibration, and building enclosure testing. The more clients recognize the value of NEBB certified work, the more opportunities we'll create for everyone in the NEBB community. Let's continue to take pride in our certification, share our knowledge, and lead the way in marketing the value of NEBB certified services. Together, we can elevate the NEBB brand, expand our reach, and create a future filled with exciting new opportunities for all. ●

Effective Ways to Market NEBB Commissioning and RCx Services

By Luke Bumgardner

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According to various market research groups, the commissioning industry has seen annual growth rates averaging between 5 to 10 percent and conservative projections anticipate continued growth of 4 to 5 percent annually over the next decade1,2. As the demand for sustainable, high-performing buildings continues to grow, the need for commissioning (Cx) and retro-commissioning (RCx) services has never been greater.

NEBB-certified firms hold a unique advantage in the marketplace due to the organization's reputation for quality, technical expertise, and adherence to standards. However, capitalizing on that advantage requires strategic marketing approaches that effectively communicate the value NEBB certification brings to commissioning projects. Here are both some tried-and-true, and a few novel ways, for NEBB Certified Firms to market their commissioning and retro-commissioning services to differentiate themselves in a competitive, growing industry:

Architect, Engineer, and Owner Education

At a high-level, educating architects, engineers, and owners on the benefits of commissioning and retro-commissioning is one of the best ways to promote services. Many building owners and project stakeholders understand the concept of commissioning, but may not fully grasp its long-term benefits. To effectively market services, focus on educating potential clients on the benefits of Cx and RCx by creating educational content, referencing industry studies, or citing previous project experiences that showcase the value of Cx and RCx.

Of the major stakeholders, directing marketing and education efforts towards owners is typically the most effective approach since the majority of commission-

TIP: Host webinars or lunch-and-learn sessions for architects, engineers, facility managers, and building owners. These introductory-level sessions can help build relationships, answer questions, and establish your firm as a trusted commissioning/retro-commissioning resource.

ing and retro-commissioning projects are executed directly through the owner. Not to mention, building owners, operators, and occupants benefit the most from Cx and RCx services. Keep in mind that RCx work is executed directly through building owners and is commonly sold on trust for results, while Cx services are normally purchased through an open RFP/RFQ process.

Aside from educating potential clients on the benefits of Cx and RCx services, presenting a general outline of the NEBB procedural standard(s) and the Cx, or RCx, process is an effective selling point. Be sure to highlight NEBB's requirement to own calibrated equipment and perform hands-on, technical testing. This is a huge aspect that differentiates NEBB-certified firms from other Cx organizations which may not require the use of instrumentation or technical testing to the same extent as NEBB. It also helps provide the architect, engineer, and, most importantly, the owner reassurance that the Cx team will be on-site, hands-on, testing the system.

Foster Relationships with Existing Building Owners

Retro-commissioning is a significant business opportunity for TAB firms, HVAC contractors, and engineering/commissioning firms to correct underperforming buildings and improve indoor environmental conditions and comfort, while optimizing energy usage for aging facilities. The primary goal of retro-commissioning is to improve the operation of existing systems at the lowest possible cost to the owner. These improvements contribute to a better built environment, which is especially valuable for commercial buildings, educational institutions, and healthcare facilities. Retro-commissioning aims to fix issues that owners have been told are impossible to fix, and have likely tried many times and failed. Commonly, this is because owners, or contracted service providers, have never identified the root cause of the problems and only worked on symptoms of the issues. Therefore, it is crucial to market how NEBB's RCx approach focuses on identifying the root cause of underlying facility issues, leads to fewer complaints from tenants or occupants, and reduces costly downtime associated with equipment failures.

It is important to understand most NEBB RCx projects are undertaken to correct poor building performance and comfort issues, and not necessarily for lowering energy costs. This is a major difference between NEBB and other industry organizations marketing existing building commissioning as only an energy audit. Aside from improved building operation, a secondary argument for RCx is the financial return on investment. Building owners are often concerned with operating costs, and energy expenses are a major component. By clearly communicating the potential for cost savings through improved building operation and reduced maintenance, NEBB-certified firms can make a strong case for RCx as a cost-effective investment. When marketing to building owners, consider providing examples of improved facility operation and any energy

TIP: Marketing retro-commissioning is radically different from marketing commissioning in both who to approach and who purchases RCx services. RCx is commonly sold to the facility and operation teams responsible for building performance and operating costs, where Cx is usually sold as part of a new project and may be focused more on sustainability initiatives rather than performance. RCx marketing takes effort developing a customer over an extended period – typically one to two years – and is more than responding to RFPs or RFQs.

savings achieved in past projects. Be sure to highlight the payback period of past RCx projects where possible. Emphasize that RCx does not require significant capital expenditures compared to full-scale renovations, making it a more accessible option for most budgets.

One of the most effective ways to engage building owners is by offering a complimentary (or discounted) initial assessment or walkthrough. By providing this service, NEBB Certified Firms can demonstrate technical expertise firsthand and provide building owners with insights into a building's performance potential. This approach shows a firm is committed to transparency and is willing to invest in helping building owners understand the RCx process.

Experience and Familiarity with Sustainability Initiatives

Much of the industry's growth can be attributed to educating project stakeholders, but what about seeking continuing education and experience as a firm? An increasing portion of Cx and RCx projects are being driven by sustainability programs such as LEED, Passivhaus, and WELL. These sustainability initiatives often require new building commissioning, ongoing commissioning, and sometimes even monitoring-based commissioning goals. It is critical firms familiarize themselves with the commissioning requirements of various sustainability programs and seek to not only gain, but also highlight, sustainable project experience.

Keep in mind that certification programs have expanded the scope of Cx and RCx to include more than just HVAC systems. For instance, LEED and WELL standards emphasize water systems, lighting, air quality, renewable energy systems, building envelope, and occupant comfort as part of their performance criteria. This has led to a demand for comprehensive, whole-building commissioning. As the industry focus shifts more and more towards sustainability, decarbonization, and energy reduction, the number of building owners adopting these types of initiatives will only continue to grow.

TIP: Consider developing marketing material that highlights completed commissioning/ retro-commissioning projects with sustainability goals. Many of these initiatives require a plan for ongoing or monitoring-based commissioning – this a great opportunity to market continued Cx/RCx services throughout the lifecycle of the building.

Monitor Upcoming Municipal Work

Budgets and planning for municipal new construction and renovation projects are generally done well in advance compared to most private projects. Municipal projects are typically funded through annual government budget cycles, which means that funding for construction is planned and approved as part of a multi-year budgeting process. Agencies are required to follow strict rules of transparency and public accountability throughout this process which means these projects are typically public information. Almost all projects, with few exceptions, go through an open bid process which can be beneficial for newly established firms. Keep an eye out on municipal bid boards where new and upcoming projects are publicly posted as RFQs.

TIP: By planning and budgeting well in advance, municipalities reduce the risk of budget shortfalls or the need for last-minute changes that could impact the project's feasibility. This means that in the long-term, the supply of municipal projects is steadier and funding is more reliable than private industry, particularly during recessionary periods.

Many municipalities have incorporated commissioning/retro-commissioning requirements into building codes or owner project requirements to support energy efficiency and environmental goals. For example, cities like New York, San Francisco, and Washington, D.C. have enacted building performance standards that require buildings to meet specific energy efficiency benchmarks. Commissioning, particularly retro-commissioning, is often necessary to bring older buildings into compliance with these standards. The continued adoption of these requirements will only continue to expand the needs for Cx and RCx services.

Large Commercial Projects

Focusing now on the private sector, a growing number of owners who specialize in manufacturing, commercial real estate, higher education, data centers, or healthcare and research campuses have adopted some sort of commissioning standard that is required for any new construction project. Like sustainability initiatives, this trend will only continue to grow within the private sector as owners realize the benefits of commissioning or as local governments adopt codes and standards that mandate commissioning for new buildings.

TIP: Working with owners to develop enterprise-wide owner project requirements or Cx/RCx standards is a great marketing tactic that commonly leads to recurrent work when new projects arise.

Final Thoughts

With projections of steady industry growth and an increasing focus on energy efficiency and sustainability, NEBB Certified Firms are uniquely positioned to thrive. However, taking full advantage of this opportunity requires strategic, targeted marketing approaches. Marketing commissioning and retro-commissioning services requires a focus on education, relationship-building, and technical differentiation. By emphasizing NEBB certification, showcasing successful project outcomes, and educating potential clients, a firm can stand out in the ever-competitive commissioning industry. The growing demand for commissioning services creates an excellent opportunity for firms to showcase their technical expertise and the unique value they bring to every project. As firms look to the future, these strategies will not only help NEBB Certified Firms stay competitive, but also reinforce the essential role of commissioning in driving sustainable, high-performing buildings. ●

References:

1. Grand View Research, Commissioning Services Category Overview, https://www.grandviewresearch.com/pipeline/commissioning-services-procurement-intelligence-report.

2. IMARC, Testing and Commissioning Market Report by Service Type, https://www.imarcgroup.com/testing-commissioning-market.

Shaping the Future for Industry Standards

By Mindi Young

When hearing the phrase '*industry standard,*' many professionals head straight to referencing specifications numbers and years they were revised. But in this article, industry standard takes on a new meaning.

The construction and tech sectors have a long history of being male-dominated, with few women working at all levels, from apprentices to leadership positions. Over the past 20 years, however, the landscape has changed considerably and there are women at the forefront of the construction and tech industries.

When I began working in the industry 25 years ago, it was very different, both in terms of safety standards and workplace demographics. I remember the first commission meeting I was part of—it was intimidating, and I was one of only two females in the construction trailer. As I gained confidence in my expertise, I found that having a deep understanding of the technical aspects of the work was just as important as earning the respect of my colleagues and clients.

Early in my career, I found it difficult to be taken seriously as a female professional in a male-dominated construction industry. I had to learn how to prove myself and adapt by educating myself and

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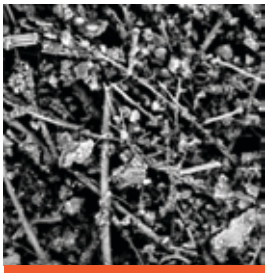
learning as much as possible. I spoke to the GC or client regarding the technical services that my company provides, how those align with the client's needs, and, more importantly, guaranteeing that the client receives what the GC has agreed to.

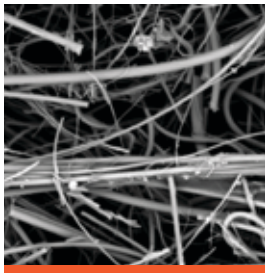
For example, if the initial filtration from HEPA filters is in the makeup air handlers (MUA), the air handlers need to be cleaned and then certified prior to blow-down–the act of firing up the MUAs and introducing conditioned air into the cleanroom space. Protecting the cleanroom begins here. If the air handlers are not meeting standards, then the cleanroom certification can be difficult. The cleanroom filters can become loaded with particles from the air handler not filtering out the particulates. If this is the case, the cleanroom filters will have increased resistance and energy consumption.

Another factor to consider is the breakdown of the HEPA/ULPA filter media due to particulate loading. The environmental conditions that a filter is exposed to will greatly influence the life of the filter. In microelectronics applications with HEPA prefiltered air, ceiling filters can be in service for 10 to 20 years. However, if the cleanroom has been compromised or the pre-filtration is not sufficient, the filter media will break down.

Filter media itself is made of borosilicate glass. When a cleanroom environment is found to be compromised by particulates, there is a breakdown of the filter media. These glass fibers, when loaded with particulates, break down, and the integrity of the filter is compromised. Under a microscope, we can see the particles attached to the filter media (left), and the breakdown of the borosilicate glass (right, where you can see the breaks in the media).



Upstream view of filter



Downstream view of filter

From these two photos you can see how the fibers are breaking down, therefore compromising the filter integrity.

Emphasizing clean construction is necessary to achieve these cleanliness standards, which should be set forth by the client. Oftentimes, however, customers need more education on what the customer specifications are, what they mean, and how to achieve these standards during construction.

What does 'clean build' mean? It means cleaning in the construction space begins immediately, and the methods change as the cleanroom moves through protocol levels, getting cleaner and cleaner. Protocol levels (as seen in Table 1) describe the cleanliness being achieved and what materials are prohibited at each level. As the building increases in protocol levels, gowning requirements also become more stringent.

Cleanliness Classification and Protocol Levels

Cleanliness Classes: This is a statistically allowable number of particles of a given size per cubic foot volume of air.

Protocol Levels: The phase or degree of construction completion that mandates specific activities, training, security clearance, dress and work protocol, cleaning procedures, work habits, and system performance. See Table 1.

Technical services involve using industry experience and knowledge to solve problems, with Cleanroom Performance Testing (CPT) being a critical portion of the construction and commissioning of a cleanroom or lab space. CPT ensures that a cleanroom operates as intended, from airflow to air cleanliness, and plays an essential role in the construction and commissioning of these environments. In my own experience, ensuring such precise testing required not only technical knowledge but also the ability to establish credibility in a field where I was one of the few young women. I stayed the course and believed in myself and my ex-

Table 1: Cleanroom protocol levels and required gowning				
Description	**Level 1**	**Level 2**	**Level 3**	**Level 4**
Use of electric scissors lifts	Yes	Yes	Yes	Yes
Clean Zone type wheels for scissors lifts. See Materials Matrix.	No	No	Yes, once corrosive-resistant and static dissipative flooring in place.	
Clean Zone type wheels for pallet jacks. See Materials Matrix.	No	No	Yes	Yes
Anti-marking protection on ladder footpad	No	No	Yes, once corrosive-resistant and static dissipative flooring in place.	Yes
Conduit bending/cutting on floor with protective mat	Yes	Yes	No pipe bending after corrosive-resistant and static dissipative flooring in place.	No pipe bending
SS tube bending	Yes	Yes	Yes	Yes
Welding in designated areas with floor protection	Yes	Yes	Orbital only	Orbital only
Grinding in designated areas with floor protection and shielding to capture particles	Yes	Yes	No grinding	No grinding
Floor damaging materials staged off floor (i.e., pipe, strut)	No	No	Yes	Yes
Fiber glass handles	Yes	Yes	Yes	Yes

pertise, speaking up and making my voice heard was key to earning that respect, and I often shared real-world examples to demonstrate how my knowledge was pivotal to the success of the projects.

I can recall a semiconductor project that I worked on earlier in my career. During the HEPA/ULPA filter integrity testing, I helped the semiconductor client troubleshoot an issue with their cleanroom ceiling–a pressurized plenum. During the leak scan, leaks were found at the sprinkler heads. We immediately went into troubleshooting mode to find the source, and discovered that the shipping splits in the grid were not fully caulked. Shipping splits, where two pieces of ceiling grid meet and are bolted together need to be caulked to have a complete seal. The leaks at the sprinkler heads traveled the length of the grid, following the path of least resistance. As the covers of the grid were removed, blue gel was found on the grid covers, indicating the grid was in fact not sealed and was leaking.

Another experience in the field that helped me recognize the importance of my CPT knowledge was when I was working on a higher education semiconductor project. Reading through their specification, I noticed it stated: Each HEPA filter shall be tested individually for leaks by full DOP challenge and scan with an aerosol photometer of either linear or logarithmic readout type. This statement conflicts with the semiconductor standards for Filter Installation Leak Testing. Per the NEBB PST, "The purpose of the filter installation integrity test is to ensure and confirm that the filter system is properly installed by verifying the absence of bypass leakage in the installation, and that the filters are free of defects and pinhole leaks."

There are two methods for testing: 1) aerosol photometer test method and 2) particle counter test method. The aerosol photometer method, which is used with a challenge of DOP or PAO oils, is only recommended for the biopharma industry. The particle counter method is used with a challenge of artificial aerosol challenge, polystyrene latex spheres, and deionized water. This method is used in the semiconductor industry. The reason the oils used with the photometer method can damage the electronics in a semiconductor cleanroom is that if you have a spill of oil in a cleanroom, you need to use a solvent to clean up the oil. Solvents in the semiconductor industry are considered contaminants and a source of Airborne Molecular Contaminants.

Airborne molecular contamination (AMC) in the cleanroom or environment must be controlled, but it comes with challenges:

- It is invisible
- It is constantly present
- It is mobile – carried by air stream
- It adheres to surfaces to form surface molecular contamination (SMC)
- Once present as SMC, it will affect product performance and yield

AMC is *invisible* and results in highly *visible* contamination issues, in the form of haze which could result in lost production and revenue. It is impossible to eradicate AMCs from the cleanroom because the sources are everywhere in the cleanroom from cleanroom construction materials to the people (source and mechanism of redistribution) who use the materials. Control of AMC in the cleanroom environment requires an understanding of their sources.

Table 2 shows the results of AMC contamination in the semiconductor manufacturing space.

Ultimately, I was able to assist the client in explaining the errors in their current specifications and was able to help rewrite their specification so that it was applicable to their cleanroom.

As I began to gain confidence in my knowledge and experience, I quickly realized that I had only scratched the surface of cleanroom certification industry standards, testing procedures, and reporting. I wanted to expand and continue to grow. Through helpful management, I started to familiarize myself with the NEBB organization. NEBB is an international organization that certifies firms and professionals in building systems, and its goal is to ensure that buildings perform as intended by the client and meet environmental and industry standards.

The function of NEBB is to educate, establish, promote and maintain high quality standards through certification of testing firms, professionals and technicians. NEBB provides education, certification, procedural standards, and networking opportunities across eight disciplines:

- Building Enclosure Testing (BET)
- Building Systems Commissioning (Cx)
- Technical Retro-Commissioning for Existing Buildings (RCx)
- Cleanroom Performance Testing (CPT)
- Fume Hood Testing (FHT)
- Sound Testing
- Vibration Testing
- Testing, Adjusting and Balancing (TAB)

Table 2: Results of AMC contamination in the semiconductor manufacturing space

Acids & Bases	Condensables	Dopants	Metals
Fab Corrosion	Adhesion failures	Uncontrolled B, P doping	Degradation of electrical
Etch rate Shifts	SIC formation (after preoxidation clean)	Threshold voltage shifts	Properties of Si substrate (e.g.: Carrier lifetime, Leakage currents)
DUV Photoresist T-topping	High contact resistance	Resistivity shifts	High contact resistance
Wafer and Optics Hazing	Gate oxide integrity	Nucleation irregularities	Gate oxide integrity
Metallization Corrosion	Ineffective cleaning	HEPA filter degradation or outgassing of B & P	Threshold voltage shifts

Slowly but surely, I gained my industry knowledge through NEBB, specifically in CPT. I had wonderful mentors from the beginning encouraging me to broaden my skill set and helping me navigate my journey with NEBB. I started by attending CPT seminars and was accepted to sit for the Certified Technician in CPT exam. Once I passed the exam, my confidence increased even more, as I was able to speak to customers in-depth about cleanrooms, how they work, and what the GCs need to be aware of during the construction phase.

I was once on a project, working for the GC where we were performing filter integrity testing, and many leaks were found in the filter media. The GC's client brought in another certification company to repeat the testing we performed; still, no leaks were found. This led to a conversation and explanation as to how we performed our testing versus the other certifier. I was able to explain that we were using three return air handlers to introduce our challenge, whereas the other certifier only used one return air handler. I was able to speak to the clients regarding the mixing of the challenge, how to determine the upstream concentration, the speed at which the leak scan probe is moved over the filter media and determining the Np and what classifies as a 'significant' leak. In this case, dilution was the solution. We were using more challenge than the other certifier when performing our filter integrity testing, which led to the discrepancy in the results. NEBB CPT knowledge and experience led me to be able to explain all of that clearly to the client.

Gaining my Certified Professional certification in CPT in 2020, and being asked to join the NEBB CPT Committee, only further broadened my industry expertise–not only in CPT, but also in the other NEBB disciplines.

After 20 years as a field technician, keeping my finger on the pulse on how the cleanroom performs based on client specification in relation to cleanliness during the construction phase, I have slowly moved on to consulting and educating clients.

The first question I always ask is: Does the customer have a specification for cleanroom certification? If yes, this will dictate all certification parameters: purpose

of the test, required test conditions, test procedures, and acceptance criteria documentation. A cleanroom specification outlines the details and requirements for designing, building, and certifying a cleanroom. This ensures that the cleanroom meets the level of cleanliness for its intended use. Certain factors like air filtration standards, particle count limits, pressure differentials, surface finishes, and operational procedures prevent contamination in sensitive environments like pharmaceutical manufacturing or microelectronics production. Specifications define parameters that minimize the presence of airborne particles, microbes, and other contaminants within the cleanroom, crucial for processes where even minute particles can affect product quality. If a customer does not have a specification, I recommend using the NEBB Procedural Standard for Certified Testing of Cleanrooms along with other industry specifications such as ISO 14644. Helping the client understand that building a cleanroom for advanced manufacturing is different than constructing a life science cleanroom or lab is essential.

Recently, I was assisting on an advanced manufacturing project where the GC was not going to build clean to save the project money. I explained that in the long run, building a cleanroom dirty then expecting it to perform to the client's specifications and standards risks the need to spend even more money.

Figure A and Figure B are representative of a project that I was heavily involved in at the time.

The amount of debris and particles captured in the filter is a direct result of filter installation prior to the

Figure A: Post FFU removal, ULPA filter upstream

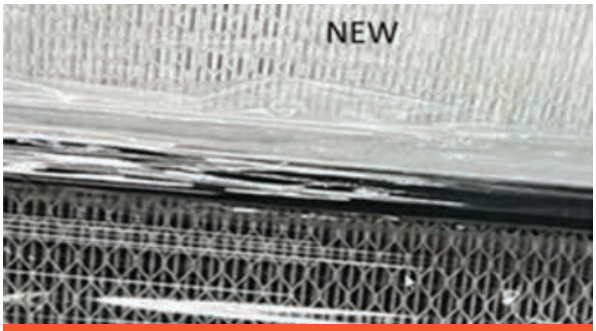


Figure B: Filter removed from the ceiling vs. new, unused filter

building being fully enclosed, not performing continuous cleaning, or enforcing cleanroom protocols. Being able to give these visual examples helped build my case as to why the client needed to build clean. I explain to my clients the reasons behind building clean and having a Cleanroom Cleaning and Protocol Specification. Building clean minimizes the introduction of particle contaminants into the cleanroom, ensuring the final space is as clean as possible for its intended use. Some key points to building clean are as follows:

- **Protecting product integrity:** This prevents foreign particles from contaminating the products being manufactured in the cleanroom, which could affect their quality and functionality.
- **Strict material control:** Selecting construction materials that are not particle generating and managing the flow and wipe down of materials into the cleanroom.
- **Air filtration systems:** High-efficiency particulate air (HEPA) filters are used to remove particles from the air during construction, ensuring a clean environment.
- **Thorough cleaning procedures:** Regular and thorough cleaning of all surfaces and equipment is essential to maintain the cleanliness of the construction site.
- **Managing protocol levels:** As the construction moves along, the building becomes cleaner, gowning requirements change, and materials allowed in the cleanroom become more stringent.

Now that I have found my passion in educating my clients, I offer lunch and learn events addressing the importance of cleanroom clean build construction, continuous cleaning, protocol management and cleanroom certification. Presenting to all levels of management, estimators, superintendents, project managers and business unit managers helps to make a seamless integration of technical services and construction. The experience I have from working in the field and being a certifier, and the knowledge I have gained from that, as well as years of continuing education in CPT through NEBB has provided me with a unique opportunity to offer valuable insight.

Twenty-five years later, I am proud to say I've found my calling and I see women in the construction industry confidently leading projects, contributing to meetings, troubleshooting challenges, and asserting their expertise. I look forward to seeing the industry continue to evolve and attract more women to help shape the future, leading with knowledge, authority, and expertise that can drive meaningful change. ●

NEBB Across the Generations

Since 1971, NEBB has been serving firms and individuals that deliver high performance buildings and systems. As the premier international certifying association in the building industry today, NEBB thrives as a result of collaboration across various generations that all bring different experiences and perspectives to the table. We sat down with NEBB Past President Amber Kelly to discuss her personal journey with NEBB below:

The NEBB Professional (NP): What generation do you identify with?

Amber Kelly (AK): Generation X (born 1965–1980) - The Best Generation 😜

NP: Briefly explain your journey with NEBB: How did you initially get involved?

AK: This was an unexpected career path for me. I was working within the start-up division at ACCO Engineered Systems, one of the largest mechanical contractors in the nation, when the NEBB CP at the time decided he was going to move into another role within ACCO. So, I was asked to prepare for the exam. At the time, I knew it would be a challenge, but I wanted to better my career potential by having the TAB CP under my belt. Once I finally passed all of the exams, I was asked by the local chapter to volunteer at the chapter level. Little did I know, I was on the path to becoming President of NEBB.

NP: What made you want to get more involved? What committees or positions have you been involved with?

AK: My chapter was looking for new volunteers and I was approached to participate at a chapter event. Soon, I was on the Chapter Board. Since the start of my involvement, I have been on the Chapter Board and served as Chapter President. I started volunteering at the national level on the NEBB Marketing Committee, then moved onto the NEBB Board of Directors, NEBB President, T24 Committee, CAC Committee, and at some point I was a corresponding member on the BSC Committee.

NP: Was it difficult to find the time to volunteer with NEBB? How do you feel your involvement with NEBB has been an investment in yourself and your career?

AK: No, it was not difficult to find time. I was passionate about being involved and helping where I could help out. I also looked forward to interacting with other NEBB individuals throughout NEBB. I always learned something from my NEBB colleagues and always look forward to my time at NEBB events. NEBB has always had a reputation as the "gold star" when it comes to certification. As I became involved with NEBB, the reputation proved to be true. NEBB continues to hold the highest standard for certification in building system standards.

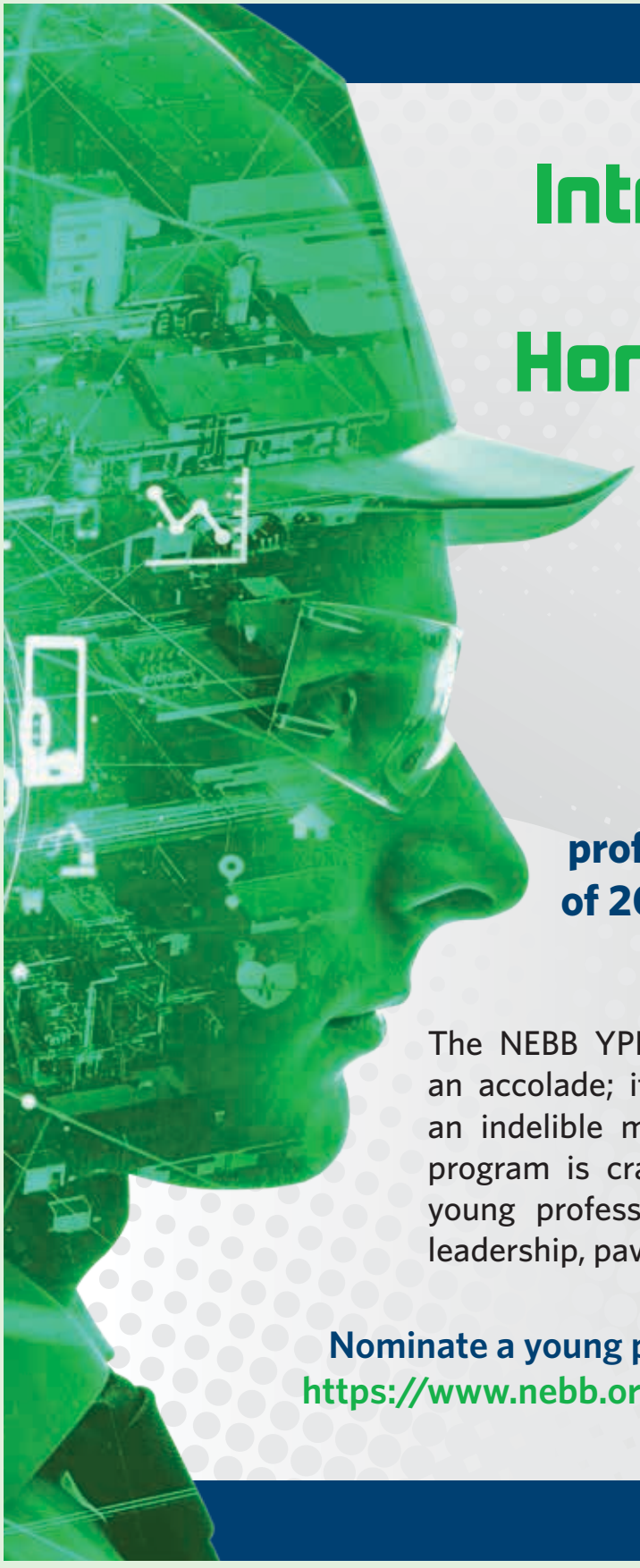
NEBB's volunteers make NEBB what it is. Continual need for individuals who hold the passion the current group of volunteers hold is essential. The growth and future of NEBB is riding on our Young Professionals and the subject matter experts we count on today.

NP: What would you like to see for the future of NEBB? How do you see NEBB transforming in years to come?

AK: I hope NEBB continues to improve the industry by providing high level courses and training. This is what has made NEBB the gold standard in my eyes. Now that NEBB is also offering online training, NEBB is giving individuals the opportunity to grow their knowledge from anywhere in the world. NEBB is always looking to offer the highest standards for the Firms and Individuals. We strive to offer the best training and education in the industry and will continue to make this a priority. As NEBB transforms to meet the needs of our industry across the globe, I hope we will see more individuals benefit from all NEBB has to offer.

NP: As a business leader, you've led others through transformation and adaptation before. What do you think helped facilitate any changes that led to a brighter future?

AK: I think it is important to show confidence in individuals when you are training or preparing them for future success. Once they see someone believes in them, the world is their oyster and their potential for success is almost guaranteed. As a leader, seeing your team succeed and grow is so rewarding. ●



Introducing the NEBB YPN Honors Program

NEBB YPN
Young Professionals Network
ypn@nebb.org

Do you know a young professional between the age of 20-39 whose achievements deserve recognition?

The NEBB YPN Honors Program is more than an accolade; it celebrates those who have left an indelible mark on the NEBB industry. This program is crafted to acknowledge and honor young professionals who embody exceptional leadership, paving the way for a brighter future.

Nominate a young professional and learn more at:
https://www.nebb.org/nebb-ypn-honros-program/

The YPN Honors Program: Honoree George Martin

By Quinton Smith

The NEBB Young Professionals Network is happy to announce the YPN Honors Program's inaugural honoree: George E. Martin, PE, CBCP, CEM, NEBB TAB CP, GGP.

George's track record speaks volumes about his dedication to NEBB. Over the past six years, George has served as a member of the Northeast EBB Chapter Board, and has served as the YPN Chapter Liaison for the past six months. In addition to serving NEBB at the chapter level, George has dedicated time to multiple NEBB National Committees as a corresponding member. George has volunteered over forty hours of his time to the TAB Committee alone to help with various ongoing projects, including the development of the metric version of the NEBB TAB Workbook.

In addition to his volunteer work, George has submitted several articles for publication within *The NEBB Professional*, which many have undoubtedly read and enjoyed. George has been a fierce advocate for NEBB, promoting the organization within both his firm and his local chapter of ASHRAE, where he also chairs the membership committee.

Stellar volunteer acumen aside, a quick conversation with George will immediately indicate a level of care and professionalism in his attitude and work ethic that perfectly demonstrates the qualities which NEBB stands for.

George's decade of experience as a NEBB TAB CP has not dulled his curiosity and desire for excellence. He is currently preparing for the NEBB RCx CP exam in hopes to achieve certification later this year.

In his own words, George acknowledges that there are many equally deserving recipients of this honor. However, his humility and dedication illustrate the content of his character and his unwavering commitment to NEBB. While he may not believe it so, the YPN Committee believes there are few who have better exemplified the qualities this program is intended to celebrate.

Please join us in congratulating George!

A Look Back at the 2024 NEBB Annual Conference

By Luis Chinchilla

NEBB could not have ended 2024 on a better note than with our Annual Conference in Phoenix, Arizona. It was a well-planned event, thanks to the dedication of the entire team behind it. Every detail was carefully considered, ensuring attendees had ample opportunities to connect with speakers, vendors, and fellow NEBB community affiliates.

The event opened with an inspiring keynote by Aaron Ralston, who shared his personal journey and the life-changing lessons he learned along the way. He left the audience with two fundamental messages:

1. Life will always present us with "boulders" of different sizes, and how we choose to face these challenges defines us.
2. Meaningful relationships—those that stand by us in our toughest times—carry us through, making it essential to continuously nurture and grow them.

After this, one of the funniest times of the day took place with the ¨Get Acquainted Reception¨ and the Costumes contest, where each one of the participants that dressed up as well as regular attendees had a crack with the Costumes, the creativity around those and the desire to enjoy every single moment of the reception, not missing the great food and music during the night.

The following two days were packed with plenty of activities, great Panels, and presentations by all of our speakers as well as the NEBB Town Hall and reports by our different committees.

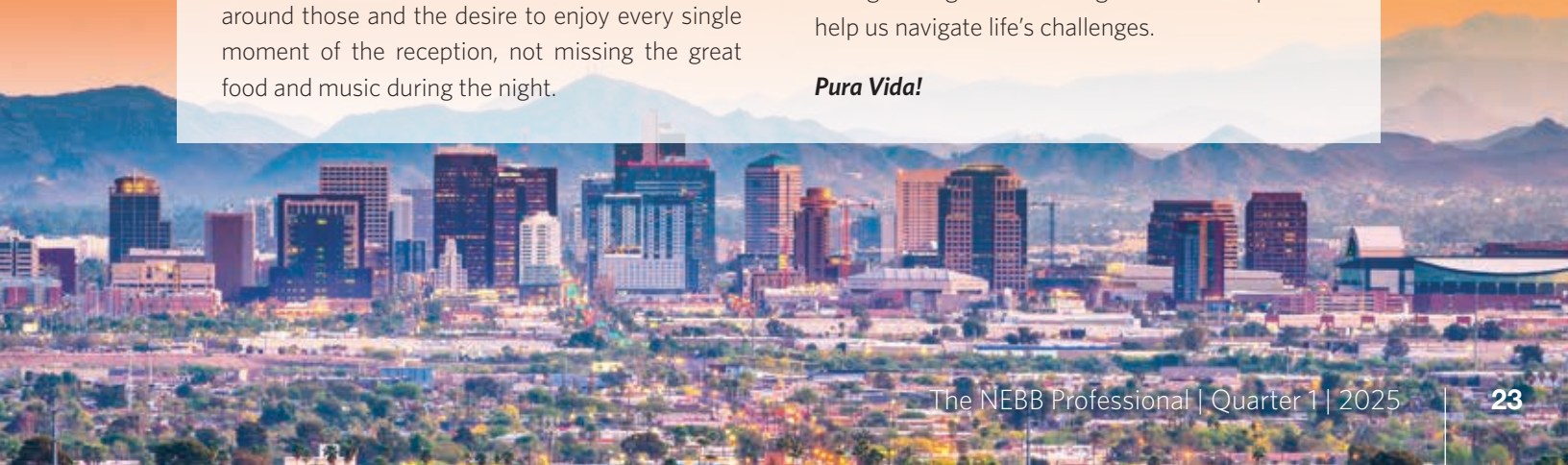
The next two days were filled with insightful panels, engaging presentations from our speakers, the NEBB Town Hall, and committee reports. Our new conference format allowed more time for attendees to explore vendor booths, while the "Guest Event"—a visit to the breathtaking city of Sedona—was a true highlight.

As is tradition, the event concluded with the closing session and vendor reception, where the energy, passion, and excitement were palpable—especially during the vendor giveaway event.

Finally, the NEBB Board continued its dedicated efforts, holding both open and closed board meetings on Sunday to establish key decisions and frameworks for the years ahead.

I'd like to close by extending both an invitation and a challenge to all NEBB affiliates: Let's continue making this Annual Conference our premier event, strengthening the meaningful relationships that help us navigate life's challenges.

Pura Vida!



The 2024 NEBB Annual











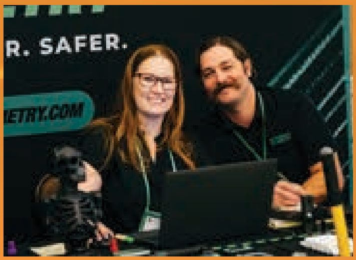









Conference in Pictures





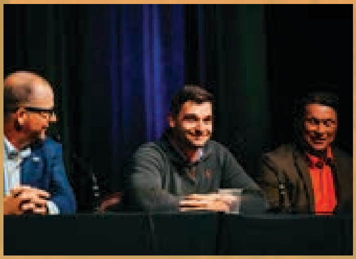














The NEBB TOOLBOX

How to Find NEBB Work

By Jeff Schools

READ, QUIZ, EARN!
After reading the full issue, please go to the NEBB Learning Center at https://nlc.nebb.org to take a 5 question quiz to earn 1 CEC/1 AIA LU!

A Recap from the Annual Conference Panel Discussion

I had the pleasure to moderate the NEBB discipline panel entitled "How to Find NEBB Work" at the 2024 NEBB Annual Conference held in Phoenix, Arizona. The panel consisted of the following NEBB Professionals: Mike Peak from the BET Committee, Luke Bumgardner from the CX/RCx Committee, Tiffany Russell from the CPT Committee, Mike Kelly from the FHT Committee, Chad Matthews from the S&V Committee, and Don Pittser from the TAB Committee.

By following an outline I had created, we were able to focus on topics and areas of discussion that encouraged audience participation and engaging conversation amongst the attendees. The outline was as follows:

Building Enclosure Testing

- **Construction Bid and Spec Work**

General Contractors seek BET services to verify the quality of construction and adherence to the design specifications.

- **Energy Efficiency Programs**

Work is found through sustainability programs that require building enclosure testing to assure air tightness and thermal performance.

- **Insurance and Warranty Claims**

Insurance companies and warranty providers might require Building Enclosure Testing for claims related to building envelope performance.

Commissioning

- **Architect and Engineer Collaboration**

Commissioning agents work closely with architects and engineers during the design and construction phases to integrate commissioning requirements.

- **Sustainability Initiatives**

Green Building certifications, such as LEED, often require commissioning, leading to opportunities in sustainability focused projects.

- **Government Work and Large Projects**

Many government buildings and large commercial projects require commissioning, which creates a steady demand for these services.

Retro-Commissioning

- **Existing Building Owners**

RCx professionals target owners of existing buildings who are looking to optimize the performance of their building systems to save energy costs and improve occupant comfort.

- **Energy Retrofit Programs**

Work can be found through programs aimed at energy efficiency upgrades and retrofits.

- **Performance Contracts**

Energy Service Companies (ESCO's) who develop, design, build, and arrange financing for projects that save energy, and reduce energy costs often require Retro-Commissioning services.

Cleanroom Performance Testing

- **Pharmaceutical and High-Tech Industries**

These industries frequently need cleanroom testing to comply with strict cleanliness and contamination control standards.

- **Facility Maintenance**

Regular maintenance and recertification of cleanrooms provide ongoing work opportunities for Firms who provide CPT services.

- **Regulatory Requirements**

Compliance with regulatory bodies like the FDA (Food and Drug Administration) or ISO (International Organization for Standardization) standards drives demand for CPT services.

Fume Hood Testing

- **Laboratories and Research Facilities**

These facilities require regular testing of Fume Hoods to ensure safe working conditions and compliance with health and safety regulations.

- **Academic Institutions**

Universities and Colleges with laboratory facilities regularly need Fume Hood testing services to ensure that their researchers are working safely.

- **Industrial Facilities**

Certain industrial settings and companies with hazardous materials handling also require Fume Hood testing to maintain safety standards.

Sound & Vibration Testing

- **Specialized Markets**

Sound and Vibration professionals can find work in specialized markets such as auditoriums, hospitals, and industrial facilities where noise control is critical.

- **Construction Managers or General Contractors**

Sound and Vibration Firms are often hired as consultants that need to address sound and vibration issues on their projects.

- **Regulatory Compliance**

Ensuring compliance with noise regulations and standards can lead to ongoing work with developers and municipalities.

Testing Adjusting and Balancing

- **Building and Contractor Networks**

TAB Professionals often build strong relationships with contractors, mechanical engineers, and building owners who require their services to ensure their HVAC systems are functioning properly.

- **Project Bid & Spec Work**

TAB Firms participate in the bidding process for new construction and renovation projects that specify the need for certified TAB services.

- **Referrals and Repeat Clients**

High performing TAB Firms usually get repeat business and industry referrals from previously satisfied TAB clients.

General Strategies for all NEBB Disciplines

- **Certification and Accreditation**

Holding Certification is a key selling point that assures quality and reliability of services.

- **Industry Networking**

Active participation in industry conferences and trade shows helps stay visible and connected.

- **Marketing and Outreach**

Maintaining an online presence through a website and social media engagement.

- **Technical Expertise and Continuing Education**

Staying updated with the latest technologies, standards, and best practices through continuous education helps maintain a competitive edge.

Each of our NEBB disciplines has its unique avenues and strategies for securing work, often revolving around the specialized needs of their respective client bases and industries. I hope this article has helped by giving insight into ideas that you may not have thought of or used previously. ●

WAR STORIES

A Cold Day in Nashville

By William Bailey

READ, QUIZ, EARN!
After reading the full issue, please go to the NEBB Learning Center at https://nlc.nebb.org to take a 5 question quiz to earn 1 CEC/1 AIA LU!

Temperatures in Nashville, Tennessee in the winter average about 12°F (-11° C). One particular Saturday at home, I was sipping a hot cup of coffee with my wife, while outside temperatures were below average. As best I can remember, the outside temperature on this day was around 9°F (-12.7°C). Then, my work phone began to ring.

I reached for it, fully expecting to find the call coming from one of my employees – probably a service technician looking for some direction. However, this particular call was actually from a repeat client and good friend who worked for a local engineering firm. When I answered the call, he was in a panic.

The engineer began to explain that there was a building in downtown Nashville that was not able to maintain a comfortable temperature. He had received a phone call from the building owner and facility engineer saying that they could not get the building to warm up. The lower floors were hovering near 60°F (15.5C) with both of their boilers operating at 100 percent. The engineer asked if I would be willing to meet him on site and help investigate the issue. I grabbed my coat and went on my way.

On the drive to the site, my mind started running through different possibilities of what could be causing the heating issue. As mentioned, I had a long history working with this particular engineer and worked with him on multiple projects. We had a great deal of respect for each other. Which, as a side note, is really a valuable aspect of the kind of work we do. In working with multiple engineers over the years, one has the opportunity to grow professionally and learn a lot, especially when working on new buildings that use new technologies or designs.

Once I arrived at the site and met with the engineer, we began walking through the facility to get a sense of what was happening and why the facility was struggling to maintain its temperature setpoints. We looked

over the design – (2) DX Air Handling Units using condenser water to reject heat that served multiple VAV boxes (some of which were fan-powered) with reheat coils. These units also had economizer coils to utilize free-cooling when outside air conditions were favorable. The building also had a large Energy Recovery Unit (ERU) on the roof that supplied outside air to a VAV that served the Mechanical Equipment Rooms (MERs) where the AHUs were located. For the average commercial office building, there was really nothing special to see here. Everything looked pretty typical.

We turned our attention to the Building Automation System (BAS) and noticed that the hot water pumps were running at their maximum speeds and maintaining a differential pressure set point of 12psid for the HW loop. I couldn't see anything out of the ordinary, so I asked my engineer friend if he thought the boilers were sized appropriately for the load being put on the system. Did we have enough heating capacity from these boilers to accomplish what was needed? He looked everything over and responded by saying that, even under these conditions, he sized the boilers so that one would run while the other could sit idle as a stand-by unit.

I turned my attention to the ERU and asked the Facility Engineer to pull it up on the BAS so we could see how the heat recovery wheel was performing given the low temperatures. Meanwhile, we reviewed the submittals and saw that the ERU had been selected for a 0°F (-17.7 °C) entering air temperature at the wheel, but the building space temperature (which would be the air exhausted through the ERU) was cooler than what was shown on the design, so there was no telling what the temperature profile of the unit would look like.

Turning back to the BAS, we found the smoking gun. The equipment submittal showed that the heating coil at the unit was installed upstream of the energy wheel instead of downstream of the wheel where it could then be used to provide supplemental heat to the system. Having it installed upstream of the heat recovery wheel was putting a tremendous - and unaccounted for - load on the boilers, as the entering air temperature to the coil was (again) 9°F (-12.7 C). What made this even more concerning was that the HW loop had no glycol in it. Had either of the boilers or their respective pumps failed to run, the coil in the ERU would have been at serious risk of freezing. Between trying to keep the hot water coil at the ERU warm and satisfy the additional load with the HW reheat coils at the VAVs, there was no way the system could get the building to setpoint.

Turning back to my buddy the engineer, I asked him what the purpose was behind installing the HW heating coil upstream of the energy wheel. He said the equipment vendor had recommended this layout to him as a way of defrosting the energy wheel when needed.

Since the building was presently unoccupied and there was really no need for continuous ventilation, we decided to temporarily shut off the ERU. Once the ERU was shut off, we quickly saw the building's hot water loop reach its leaving temperature set point. The boilers started backing down to maintain this temperature until one of the boilers turned off completely. Having met the set point for the loop, the VAVs were now reaching their designed discharge air temperatures and space temperatures were increasing.

It was decided that, the following Monday, the hot water heating coil for the ERU would be isolated and drained. Now that space temperatures were reaching their design set point, the heat recovery wheel would be able to maintain its intended discharge air temperature. The design engineer would reach back out to the vendor to look into other options to defrost the wheel and help the entire system operate more effectively.

Having solved the mystery, we left the building that Saturday with my engineer buddy feeling grateful and relieved to see that his design was operating as it should have. In fact, it continued working well from that day forward! This would be one more story we could share as colleagues that would continue developing the relationship between my firm and his and that helped us both to continue growing professionally and improving our skills in design and installation work. As NEBB CPs, we are all in a position to develop relationships like these with others in our field. As long as we continue learning and leaning on our past experiences and knowledge of systems, we can help others in our industry to grow! ●

2025 NEBB Technical Seminars Schedule

- **Building Enclosure Testing Seminar**
  June 2-4, 2025 at NEBB TEC in Gaithersburg, MD
- **Building Systems Commissioning Seminar**
  June 26-28, 2025 at NEBB TEC in Gaithersburg, MD
- **Retro-Commissioning for Existing Buildings Seminar**
  August 12-15, 2025 at NEBB TEC in Gaithersburg, MD
- **Clean Performance Testing Seminar**
  August 25-27, 2025 at NEBB TEC in Gaithersburg, MD
- **Sound & Vibration Seminar**
  September 2-5, 2025 at Denver, CO
- **Testing Adjusting and Balancing CP Seminar**
  September 18-21, 2025 at IMI Training Center, Irving, TX
- **Fume Hood Performance Testing Seminar**
  September 23-24, 2025 at Labconco, Kansas City, MO
- **Testing Adjusting and Balancing CT Seminar**
  November 3-5, 2025 at NEBB Annual Conference, Memphis, TN

Visit https://nebb.org/events/ to register or learn more

Chapter News

Florida EBB Chapter

Terry Wichlenski, Chapter Coordinator

The Florida EBB Annual Business Meeting and Recertification Seminar will take place May 8-9, 2025 at The Margaritaville Resort in Orlando, Florida. Our agenda is set and we are ready to welcome NEBB President Mike Kelly. Mike will be providing the NEBB Update Report as well as a Fume Hood Testing Session. Technicians will have a full day on Friday with their session track, too.

Our most recent TAB Practical Test Date occurred April 11th at our Jacksonville Test Site and April 12th at our Deerfield Beach or Largo Test Sites. Remember, when we have at least two candidates and one of our exam sites is available, we can accommodate you.

The Margaritaville Resort in Orlando, FL

Contact FEBB Chapter Coordinator Terry Wichlenski at 727-240-4254 or febbchapter@nebb.org to schedule your TAB Practical Exam or register for our Recertification Seminar, today.

MAEBA Chapter

Trish Casey, Chapter Coordinator

The MAEBA chapter will be holding its Annual Recertification Seminar this September 14-15, 2025 at the Wind Creek Bethlehem.

Wind Creek Bethlehem is next to the old Bethlehem Steel plant which served as the economic lifeblood of the community, employing tens of thousands of people while producing the steel that built our nation's skyscrapers, bridges, and even the U.S. Navy, helping win two World Wars in the process. Bethlehem Steel was incorporated in December 1904 by Charles M. Schwab, a former Andrew Carnegie disciple. In 1995, however, after a nearly 120-year history of steel production on the site, the plant closed its doors forever.

Top: Wind Creek Bethlehem; Bottom: SteelStacks Cultural Center

Rather than demolish the historic mill or walk away and let it fall apart, it was transformed into an arts and entertainment district that showcases music, art, festivals, educational programming and more throughout the year. When guests visit the SteelStacks campus, the first thing they usually notice is the towering 'stacks' after which the campus is named, allowing visitors to walk around and see the history that helped build this country. What many people may not realize is that these iconic structures are a series of five blast furnaces that were used in the iron making process at Bethlehem Steel for over 100 years.

This year, MAEBA will not be holding a semi-annual meeting. All technicians will be given the option of attending a half-day session or the full day seminar to obtain their continuing education credits. The MAEBA Technical Committee is hard at work scheduling technical presenters for this year's seminar.

Pacific Southwest NEBB

James Rosier, Chapter Coordinator

Pacific Southwest NEBB has been hard at work on marketing its members across two areas of its geographical area in magazines: The *AIRAH* in Australia and *Consulting-Specifying Engineer* in California, Hawaii, and Nevada.

Pacific Northwest EBB

Shandre Guy, Chapter Coordinator

The Pacific Northwest EBB Chapter is proud to announce it has officially been approved as a practical exam site! We look forward to inviting you to future events. Please reach out to Shandre Guy, Pacific Northwest NEBB Chapter at pnebbchapter@nebb.com for more information. ●

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