

The NEBB Professional

2016 – Quarter 1

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- NEBB's CxPP (Commissioning Process Professional) Program
- Changing Belt Driven Fan Speeds
- Marketing Refresher: Back to Basics
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Everything about
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Cover photo courtesy of NASA. Destination Mars: Orion capsule and Ares rocket aboard the new Mobile Launcher/Umbilical Tower, ready for launch at Pad 39A, Kennedy Space Center. Commercial Crew and Cargo program supported by NEBB certified TAB and Cx. Read more on page 6.

The views, opinions and conclusions expressed in this publication are those of the authors and do not necessarily reflect the official policy or position of NEBB.

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President's Message

2016: A Very Busy Year for NEBB!

Dear Colleagues, Friends, Ladies and Gentlemen,

First of all, let me take this opportunity to wish everyone of you a healthy and prosperous 2016.

With 2015 behind us, a new year is starting with a full agenda in front of NEBB volunteers, our discipline-based committees and staff. 2016 will be a very busy year, with several projects started previously coming to fruition, as well as new initiatives being launched. Here are some of the activities you can look forward to in the current year.

The ANSI accreditation process is well under way with our Certification Board working full speed in cooperation with our consultants. In early January, we received a first gap analysis report which will indicate the areas where we need to focus in order to stay on our agenda towards accreditation. Accreditation of the Commissioning Process Professional (CxPP) certification is expected in 2016.

A new database system for NEBB is being implemented by staff personnel working very hard in conjunction with our consultant. The new database, called Certelligence, has outstanding functionality that will greatly benefit NEBB firms, CPs and CTs, chapters, and volunteers. Certelligence is the only database program specially created for certification bodies like NEBB. A full launch is expected in the fall of this year. Look for more details about this at the convention in Albuquerque.

NEBB's approval as a Mechanical Acceptance Test Technician Certification Provider (ATTCP) under the California Title 24 regulation may be official as early as mid-January 2016, when our application is presented to the California Energy Commission (CEC). Getting to this point has been a long process requiring enormous volunteer time and involvement. Once approved, NEBB will be at the forefront of education and certification, greatly benefiting all of our California chapters and affiliates. Thanks to all our volunteers who worked countless hours in order to make this project come through.

The NEBB technical committees for each professional disciplines are now fully staffed with new volunteers elected at the 2015 Fall BOD meeting and are fully operational. Through the efforts of these committees, several educational seminars have already been scheduled for 2016. I encourage you to consult the NEBB website for dates and locations.

The NEBB Annual Conference will take place in April in Albuquerque. The program promises to be very exciting, with a diverse array of technical presentations covering all of our disciplines. I am confident you will find them very interesting. Alongside these presentations are business and industry topics of great interest for all participants and guests. The strong program is enhanced by the cultural and recreational opportunities of this unique desert city.

The Annual Conference program, hotel details and online registration is open on the NEBB website nebb.cvent.com. Please make your reservations now and plan to be at NEBB's premiere annual event. Our Director of Communications and Events, with support from the Albuquerque convention and visitor's bureau, has designed a unique program for tours and social activities that I am sure you will remember for years after the 2016 conference. Whether you go for a ride in a hot air balloon or go shopping/dining in Old Albuquerque or Santa Fe, you will fall in love with this part of the country. I look forward to seeing you in April!

I would like to offer my most sincere thanks to our multitude of dedicated volunteers who make this organization so vibrant and unique. Without you, NEBB would not exist. I also want to acknowledge the tremendous amount of work performed day after day in the NEBB office by the staff personnel. I visited the NEBB office in December and had the opportunity to see our wonderful team of dedicated men and women working very hard to support our volunteers.

As many of you know, about two years ago Mr. Leonard Maiani stepped off the NEBB Board of Directors in order to join the NEBB staff as our Technical Director. Those two years were a time of great change for NEBB, and through them all Leonard provided continuity and expertise that were invaluable. Leonard announced during the summer his desire to retire, and a search began for his replacement.

I am very pleased to announce that effective January 4, 2016, our new NEBB Technical Director is Mr. Don Fedyk. Don has been a NEBB volunteer for many years, serving as our Fume Hood Committee Chair and as a member of the Board of Directors. Don was deemed an excellent candidate for the Technical Director position for several reasons. He is a Certified Professional in four NEBB disciplines: TAB, BSC, FHT, and S&V. He has experience training in more than one discipline and can both support volunteer instructors and serve as a staff instructor.

On behalf of the NEBB Board of Directors, staff and all of our volunteers, I would like to express appreciation to Leonard Maiani for his many years of service to NEBB. While he will be missed as a member of NEBB staff, we are grateful that he will remain active in the organization once again from the volunteer side. Thank you, Leonard, for all you have done, and will continue to do, for NEBB and our wonderful community of certified firms, professionals, and technicians!

Sincerely,

Jean-Paul LeBlanc
NEBB President



Message from the NEBB EVP *NEBB Will Soon Have “Certelligence”*

When it comes to being a “green” organization, NEBB falls short in one area for sure. We kill an awful lot of trees.

NEBB is a very paper-dependent organization. Just this past month, as we entered the busiest time for firm and personnel certification renewal, tens of thousands of pieces of paper, and hundreds of paper checks, have crossed the threshold of NEBB Headquarters. In an age where PDF files have replaced paper files and online transactions have replaced manual check writing, NEBB is behind the curve. But not for long.


In 2015 NEBB embarked on an exhaustive search for a new association management software (AMS) program. We looked at the best known AMS packages from vendors large and small. We spoke to management and IT professionals at other organizations about the programs they use. We interviewed software providers, watched countless product demos and even explored the possibility of having a program designed from scratch to meet NEBB’s unique needs.

NEBB’s needs are in fact quite unique. While there are several developers of association management software, NEBB isn’t like a lot of associations. NEBB is a certifying body, not a membership association. NEBB certifies firms, not just people. NEBB is extremely volunteer driven and not as reliant on staff as most non-profits. It wasn’t long before we came to the conclusion that using an off-the-shelf association management software package for NEBB would be like trying fit a round peg in an oval shaped hole. And then we discovered Certelligence.

Certelligence is a cloud-based credentialing management system developed by ACGI Software. The system is the only one of its kind – specifically developed for certification bodies like NEBB. Certelligence enables the effective operation of even the most complicated certification and accreditation programs. Built on a proven enterprise database platform, it provides a comprehensive suite of modules that can be configured to automate and streamline NEBB’s most critical business functions. The system provides built-in self-service components that, when integrated with NEBB’s website, will give volunteers, candidates, certificants and participants, 24/7 access to valuable online features and personalized resources, in real time.

Life without Certelligence

A few months ago your firm was notified that it was time for its annual certification renewal. NEBB’s manual, paper-based process went into gear. Your Chapter sent you a recertification application and NEBB sent you an invoice for annual fees. You probably received these in the mail.



The invoice was likely turned over to your accounting department. A check was printed, signed and mailed to NEBB Headquarters. There wasn't an option to pay online by credit card. Your firm's designated Certified Professional (CP) probably completed the firm recertification application. He or she made lots of photocopies for the required documentation. Your CP completed the form's instrument list and probably wrote the manufacturer, model and serial number of your equipment by hand in the spaces provided. The completed application was sent, or possibly hand delivered along with a trunk load of instruments for inspection, to your chapter's Technical Committee Chair (TCC) for review. The TCC put on his or her reading glasses, reviewed the application and attachments like calibration reports, signed off on the application, and then forwarded it (probably by mail) to NEBB. The paperwork was reviewed again by staff, who then went into a modified MS Access database to update your firm's records as complete. Staff verified that payment has been received, and then produced and mailed a paper certificate and also a stamp to your chapter, and the chapter in turn forwarded the certificate and stamp to you.

From start to finish, the entire recertification process likely involved 30 or more pieces of paper, several dollars in postage, and *at least* a half day labor. And it took a couple months to complete. All that just to recertify one firm, and we haven't even touched on the recertification of your personnel – a similarly laborious process.

Certelligence to the Rescue

When it is time for your firm's 2017 certification renewal, things will be dramatically more efficient. Here's what will happen.

Your designated CP will receive an email saying it's time to renew. He or she will then log into the NEBB website, powered by Certelligence. There will be an open invoice. On the way through the online store, the CP may add a few items to the shopping cart – perhaps a framed certificate or a new stamp. The CP will enter a credit card number and pay. Payment data will be uploaded that night by NEBB staff and it will automatically populate data into NEBB's accounting software. Your account will be marked as paid.

Next your CP will complete an online recertification application by typing in the required information and uploading supplementary documents. For instrumentation, the CP will find listings under each type with drop down menus for manufacturers and models. The CP will click on the applicable ones, type in serial numbers and calibration dates, upload photographs and calibration certificates, and click submit when everything is done. That will immediately trigger an email to your chapter's TCC, telling him or her that an application is ready to review.

The TCC will log into Certelligence to review your online application. If there is something amiss, the TCC will click a few buttons and an email will go to your CP asking for the problem to be resolved. Once that's taken care of, the TCC will get another email asking for a second look. All is perfect and the TCC clicks "approved." That triggers a series of actions: your firm's listing on the NEBB website is approved for another year, a PDF firm certification certificate is emailed to your CP along with a cover memo saying the firm is recertified, and an email goes to NEBB's fulfillment department triggering the shipping of your paper certificate (if you want one) and stamps.

From start to finish, the entire recertification process will require no paper, possibly no postage, and just an hour or two of total time spent by your CP, the volunteer TCC, and NEBB staff. And it will all take about a day or two to complete.

This is just one small example of the kind of efficiencies NEBB firms, CPs, Chapter TCCs and staff will enjoy with Certelligence. There are many more benefits that are equally exciting, saving time, expense and aggravation for everyone involved.

At the NEBB Annual Conference in April, we will be sharing a lot more information about Certelligence. The program is expected to launch during the summer. In the meantime, if you want to learn more about Certelligence visit the ACGI website at <http://www.acgisoftware.com/>

Albert Einstein once said, "The measure of intelligence is the ability to change." The change to Certelligence is a measure of NEBB's intelligence!

Glenn Fellman,
NEBB Executive Vice President

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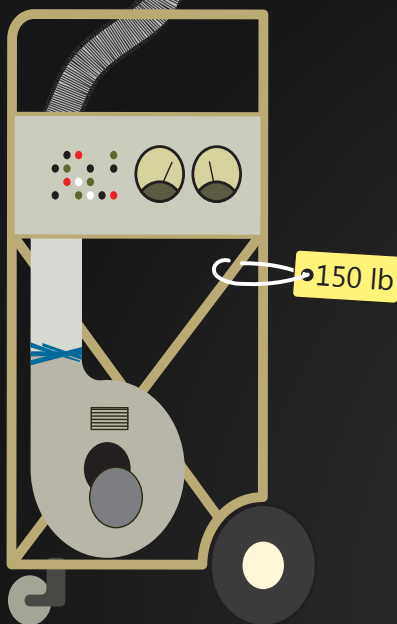
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NEBB Supports NASA's Efforts to Reach the Stars

Bert Henerson | AZS Consulting, Inc.

"To infinity and beyond," bellows Buzz Lightyear. Whether or not you remember the Toy Story movie, the tongue-in-check statement conjures up in our minds intergalactic space travel. Closer to home, that could be the motto and mission statement of Thermal System Balance Inc. (TSBI) owner and NEBB Certified Professional Curtis Smart. He has been in business and NEBB certified Test and Balance (TAB) since 1988 and Building Systems Commissioning (BSC) since 1993. Curtis was a TAB technician with TSBI in Melbourne, FL, while going to college for engineering. He later purchased the company and brought in his father, Derald, and wife, Joanne. Most of Curtis's work was at the Kennedy Space Center (KSC) located on Florida's Space Coast. The space complex is 34 miles long from north to south and is 10 miles across at the widest point. The KSC is America's only launch complex for manned operations and houses some of the most unique facilities in the world.

The company's focus was the NASA Space Shuttle program and the United States Air Force (USAF) Space Command. With their experience working for the National Aeronautics and Space Administration (NASA) and the USAF at Patrick and Cape Canaveral Air Force bases, the move to private launch contractor's SpaceX, Northrop Grumman, Blue Origins and acquiring the contract for the Boeing/Lockheed Martin joint venture the Ares/Orion project—sending man to the planet Mars—was a natural transition for Curtis and his staff of professionals.

"When a thorough testing and commissioning are performed in a project with proficient staff, the outcome would be 'phenomenal customer satisfaction'. Thanks to Curtis and his dedicated team, the final customer (Space Station Processing Team) and NASA facilities group are very thankful for a successful project delivery," said Cape Design Engineering Co. (CDE), CEO, Kannan Rengarajan in a commendation letter TSBI received for a high profile NASA project in 2014. "I couldn't do this work without the versatile and qualified techs that I have on my staff. Providing NEBB technical TAB and commissioning (Cx) requires technicians who take pride in their work and are versed in collecting and documenting field data to bring a system into the design parameters," boasts Curtis. "They must have the physical and mental stamina to push through

scheduling conflicts, contractor error, and design shortcomings to bring a project successfully on-line."

TSBI's work has evolved from being solely at the KSC/Cape Canaveral Air Force Station's (CCAFS) area to working at the



TSBI utilized instruments and techniques called out in NEBB's Procedural Standards Manual to support Lockheed Martin validation of actual "spaceflight hardware." The hardware was a heat exchanger that flew on the Space Shuttle being repurposed for the Orion capsule.

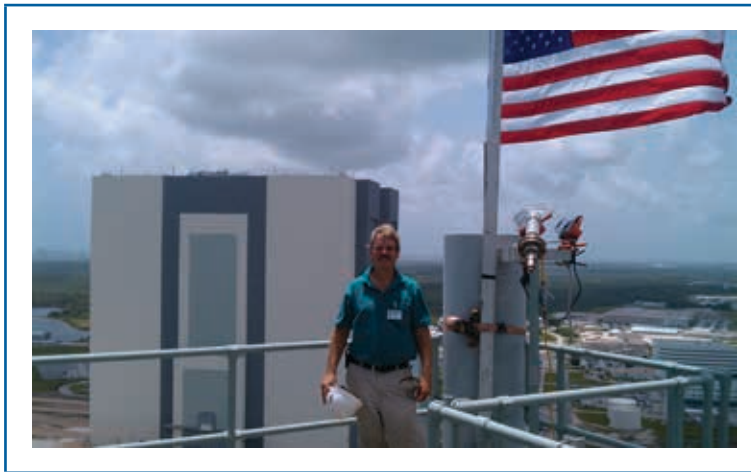
Vandenberg Air Force Base in California and the down range telemetry stations Ascension Islands South Atlantic, Azores, and Antiqua during the privatization of the space launch industry. Now the focus is more on the privatization of the space launch industry with Mars Orion project and the commercial companies involved with the project.

“Lockheed Martin and Boeing are the prime contractors building the Orion Multi-Purpose Crew Vehicle, NASA’s first spacecraft designed for long-duration, human-rated deep space exploration. Orion is designed to transport humans to interplanetary destinations beyond low Earth orbit, like asteroids, the moon, and eventually Mars, and return the crew back safely to Earth. The Orion program enables NASA to carry out a robust human and robotic exploration sustainable and affordable program. The program extends human presence across the solar system to our planets, asteroids, and other destinations. This program also develops the innovative technology, knowledge, and infrastructure needed to support more challenging human space exploration. The state-of-the-art spacecraft provides solutions to future missions and focuses directly to crew safety. The (space) craft can accommodate a crew of six astronauts; provide safe ascent and can abort safely during all mission phases. The craft can withstand re-entry speeds greater than 20,000 miles per hour.” (From NASA website).

The first engine for the Ares Orion project will be tested in the first part of 2016 to undergo certification for use on NASA’s new Space Launch System (SLS). The SLS vehicle is being developed in two versions to return humans to deep space. The “Block 1” version of the SLS vehicle is set to fly the first uncrewed mission in 2018.

As the Space Shuttle program closed, one of the first projects that Curtis and his company did for the Orion project was the TAB of the 70,000 sq. ft. Operations and Checkout (O&C) buildings. The O&C high bay is on the register of national historic landmarks from the pre-Apollo missions. The original hyperbolic pressure chambers to determine if humans could survive in space are still located there. Throughout the Shuttle years the O&C Hi-bay was used to process Shuttle payloads, but now will be used to checkout the Orion capsule.

The HVAC system was modified to supply high velocity air-flow through many side-wall registers along the length of the large high bay. HEPA filters and the air handling units were utilized to achieve Class100k cleanliness. “In addition to providing TAB, we pushed for having the Cleanroom Cer-



A short climb to the 347' level of the Launch Umbilical Tower (LUT). Tough to carry a Flowhood and instrument to, but a great place to watch the final Shuttle launches. This is the new platform and tower which will support the new Ares rocket. Seen here is Curtis Smart.

tification to be performed according to NEBB standards. A NEBB Certified Cleanroom Testing company was hired by the design-build team,” Curtis said.

The next project was the existing Mobile Launch Platform (MLP) modified by adding a 347' tall Launch Umbilical Tower (LUT) used to support the new Ares rocket that is as tall as the old Saturn V rockets. The MLP/LUT is still carried to the launch pad, LC-39A, by the original Crawlers used during the Apollo missions. The main job of the MLP is to house the ground support equipment while physically supporting the rocket and directing the extremely hot rocket engine exhaust safely away from the launch vehicle. During the Moon launches the Saturn V rockets used 15 tons of fuel per second.

All of the launch critical staff operations are in the bottom of the platform. HVAC equipment is located in the lower platform and also in the communications rooms at various levels, including one at the 347' gantry level. “That’s a long climb with a flow hood and briefcase, but was a great place to watch the final shuttle launch,” said Curtis.

TAB included envelope leakage testing of the solid steel platform and communications rooms. “We used a test fan rated for 8,000 cubic feet per minute (cfm) at 0.50 to determine sufficient air tightness for the ECS and the HVAC to purge at launch time,” explained Curtis. That’s because breathable air is pumped into the system at the pad for the technicians. Then just before the launch countdown, everyone is evacuated. At that time there is a switch to nitrogen so no air or oxygen is in the facility. Changing to nitrogen inhibits combustion. The same ducts, dampers, and outlets are used for carrying the nitrogen into the previously inhabited space.

TSBI first worked on actual Spaceflight hardware for the Orion by supporting Lockheed Martin’s converting heat exchangers from the Space Shuttle for the Orion capsule. “We



NASA Crawler Upgrade project: Curtis Smart of Thermal Systems Balancing Inc setting outside air at louver serving the operator "driver" control room.

utilized both ultrasound flow meter readings and pressure drop across installed venturi flowmeters to read a flow of R-134A down to 0.53 gallons per minute (gpm)," says Curtis.

Now, renovations for the MARS project are taking place on the facilities that use to process the shuttle. The Orbital Processing Facility (OPF-3) is now the Consolidated Crew Capsule Processing Facility (C3PF). The Vertical Assembly Building (VAB) is being re-configured for the upcoming Ares rocket and the Orbiter Support Building (OSB) is now the Processing Control Center (PCS).

"TSBI is providing both the TAB and HVAC Cx for the Design/Build team. We have conveyed to the owners and engineers that (23 05 93) TAB would be finalized and accepted prior to (23 08 00) HVAC Cx requirements," Curtis said. "Pre functional testing would commence by completing pre-checklist but there will be no Functional Performance Test started until the TAB is verified and accepted. That format separates the two functions from any conflict of interest while providing cost saving to the newly budget conscious space flight industry. I believe following NEBB's technical approach is important for a single TAB Cx professional," says Curtis. For instance, even though control contractor performance verification test (PVT's) are submitted, TSBI field verifies all sensor readings. TSBI spends the majority of Cx time on Field Performance Tests (FPT) and verifying sequence of operations. "How many jobs have TAB firms supported Cx that turned out to consist of verifying TAB only?" comments Curtis.

The C3PF facility has two large bays, High Bay and Low Bay, with extensive temperature and humidity control and cascading pressure control. There is also constant volume airflow to adjacent Offline Processing areas and variable air office spaces.

The VAB is getting new platform configurations at various levels of the existing open bay. New HVAC serves anti-rooms, gowning and, process rooms at various levels.

"The VAB is used for assembling large space vehicles. The future SLS will be assembled there. The VAB is 526' tall, 716' long, and 518' wide, the building encloses 129,000,000 cubic feet of space. The VAB is the largest building by volume in the world. The building contains about 10,000 tons of air-conditioning, including 125 ventilators on the roof supported by four large air handlers to keep moisture under control. The air in the building can be completely replaced every hour. The interior volume of the building is so vast that the building can generate weather inside below the ceiling with rain clouds on very humid days. The moisture control systems are designed to keep that kind of phenomena from happening regularly. The shuttle was not that tall in comparison to the new launch vehicles; they are as big as the old Saturn V rockets." (NASA website)

Some out of the ordinary things Curtis has encountered include the following:



Taken from the top of the VAB the new Mobile Launch Platform/Launch Umbilical Tower await the ride to Pad 39A aboard the newly refurbished Crawler.

- In 2014 TSBI TAB'd and Cx'ed the Space Station Processing Facility Science Annex. That new facility processed live animals for space flight to the International Space Station. The experiments that are carried out are for commercial use and long-term space flight. The difficulties that were encountered are the complexity of the HVAC, lighting, and processing equipment, but also the loss and expense a facility failure would cause. The rooms are designed and constructed to isolate different stages of cleanliness, treatment, and animal care subsequent to space flight. The HVAC consists of "laboratory" type variable air systems that maintain pressure boundaries across surgical rooms, clean isolation rooms, and corridors separating dirty process areas.

In addition to HVAC and process equipment tests, TSBI also provided the "comprehensive" sequence of operations testing and "control failure analysis test plans." Final NEBB certified reports were submitted for TAB and Cx and approved by NASA.

Cape Design Engineering Co. (CDE) received NASA's prestigious NASA Exceptional Public Achievement Medal, for the project and TSBI received a Commendation Letter from the design build engineer CEO Kannan Rengarajan. The letter stated, "These test plans (by TSBI) and their flawless execution well exceeded NASA's (test plans) and CDE expectations. Curtis and his team were very professional and efficient in performing field testing including 100% NASA COTR verification of TAB, sensor verifications, and Cx FPT checklist." According to CDE, when the building was Cx'ed there were hardly any calls regarding any of the programmed sequences from the operation staff at NASA. The system maintained flows, temperatures, relative humidity, and pressure relationships within acceptable parameters underlay operating conditions.

- TSBI also tested the actual air flow to the Atlas V rockets payload bay and the engine compartments. They did the tests for projects at LC-41 at Cape Canaveral and then at the SLC-5 at Vandenberg Air Force Base in California. Curtis's team set up air handlers that sent air flow, measure in lbs/hr at +70" static and a -70 dew point, up the umbilical tower to the spacecraft; they had to deal with super dry, high pressure air during TAB at Vandenberg.
- Curtis performed TAB hydronic balance of the FireX fire protection water on the pad was a test of endurance for Curtis and his team. There were three solid days of hydronic balance of over one hundred Taco circuit setters from the pad deck to the top gantry. The work was performed on Pad 39B while the shuttle was on the pad because a hard freeze was expected. NASA wanted minimum flows through all the

hose reels on the tower. The fire protection survived the freeze, but the shuttle's booster seals did not.

An interesting anecdote was while still a student in college, Curtis was a young tech working with Bill Saathoff, original owner of TSBI doing a pre-demo TAB of the USAF's original Launch Control room blockhouse. The project was to turn the 1950's Control Room and Launch Pads into a museum. When the team arrived, the security officers, who opened the vault doors, told Bill and his young techs they were the first to enter the building since the program shut down. Papers, instruments, and cigarette ash trays were just the way they were when the doors were closed when the program moved to the Gemini Freedom 7 Pads. In addition to early computers and works stations in front of the small thick glass windows, the telemetry wall had the original wires, servos, light bulbs, and a model of a capsule on a diagram of the earth.



C3PF Low Bay where the Orion capsule will be final prepped for mating up to the Ariane rocket. TSBI provided TAB and BSC Commissioning of the HVAC systems serving the Low Bay and adjacent support areas. Space pressures cascades, temperatures and humidity control was tested and documented in various modes of operation.

Curtis credits his success, to NEBB's training, standards, and the clout certification brings. Also a unique aspect of NEBB certification is being a member of a large prestigious organization while remaining independent to pursue opportunities. The TAB/Cx industry allows the flexibility to adapt to the changing technology and financial environments. "During the slow periods at NASA, we focused on school projects (thanks to the Lottery money in Florida), then providing energy savings and indoor air quality (IAQ) opportunities to private businesses," Curtis said. Additionally he reaches out to his professional network (including other NEBB professionals) that he's developed over the years. They are industry professionals who assist him in focusing his test plans on the end user needs. His colleagues are familiar with the end user so that gives his documents the perspective for their present and future needs.

"The NEBB Building Systems Commissioning (BSC) program affords assurance to building owners, architects, engineers, and other agents that systems, sub-systems, equipment, and interfaces with other building systems are installed, tested, and are operating in compliance with contract documents and within the scope of design requirements. Moreover, NEBB Certification in BSC provides firms highly competent in their

field and promotes proper execution of projects by insuring compliance with NEBB procedural standards. The BSC program builds upon NEBB's knowledge and expertise in certifying firms in various disciplines in the HVAC industry. The NEBB procedural BSC provides comprehensive guidance to a systematic development and implementation of commissioning. The standard describes organization, planning, procedures, and methods to verify and document that performance of building systems is (or is not) in conformance with building specifications and contract documents."
(NEBB Marketing Committee Chair, Eric Jenison)

Curtis continues his work for NASA. He and his team will soon be at the Johnson Space Center (JSC) working with the NASA design build team to Cx newly installed natural gas turbines that make chilled water, hot water, steam and electricity for the entire JSC campus, soon to be in operation. ■



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NEBB PROFESSIONAL COLUMN FOR COMMISSIONERS

Jim Huber, CEM, CMVP, CDSM, NEBB CP

NEBB's CxPP (Commissioning Process Professional) Program



In April 2015, NEBB announced a new certification program: the Commissioning Process Professional (CxPP). Numerous inquiries were made about the program, such as “Why it was created?,” “What IS it?,” and especially “Why do I need it?”

To understand why the CxPP was created and what it is, one needs to review industry changes that have taken place over the past five years. The U.S. Department of Energy (DOE) launched a program to require accreditation of all certification bodies that certify consultants, contractors, and others who perform any service for DOE or related U.S. Government projects. DOE stated it will not consider any certification program for DOE approval that is not ISO 17024 accredited.

February 2015 was the original deadline set by DOE; however, it was extended because the DOE was unable to have its JTA (Job Task Analysis) completed in time. The DOE is not the only agency to suggest that ISO accreditation may be a key part of its recognition of certifications in the future. In its accreditation requirements, the California Energy Commission (CEC) initially desired to require any certification body under Title 24, Mechanical Acceptance Testing Certification, to be ISO 17024 accredited. NEBB is also heavily engaged in the Title 24 initiative because Leadership believes the program will spread across the country in the next few years.

In 2010, the DOE began conversations with various commissioning organizations asking them to identify problems within the Cx industry with the intent of the DOE to bring organizations together to solve the problems. One problem identified was the various commissioning certifications and their varying requirements – e.g. experience, education, testing, etc. This caused confusion for owners and specifiers who wanted to ensure that certifications held by commissioning professionals performing the work were equal to each other. In fact, even code officials have requested

guidance as to what constitutes an acceptable credential for commissioning service providers.

It is important to note that parallel to this effort by the DOE, in May 2012, the ICC G4 Development Committee requested that IAS develop criteria for accreditation of entities involved in certification and training of commissioning agents to aid building officials with enforcement of code-mandated commissioning requirements. That program, *IAS AC476 Accreditation Criteria for Organizations Providing Training and/or Certification of Commissioning Personnel* is in effect today. Many of the Cx organizations chose not to support AC476 in its current form since it addresses a wide range of Cx activities and its application is focused on assisting the AHJ code officials; however, both IAS AC476 and DOE/NIBS CWCC will require accredited programs to comply with ISO/IEC 17024.

In 2011, the DOE, along with the National Renewable Energy Laboratory, engaged outside consultants to help establish a Job Task Analysis (JTA) for commissioning authorities. This effort established criteria for selecting Subject Matter Experts (SMEs) to create the Cx JTAs. In May 2011, eleven subject matter experts met for a three-day JTA workshop. In September 2011, the DOE published the draft document and followed a “developing a curriculum” (DACUM) method. A DACUM is an occupational analysis led by a trained facilitator where experts in the Cx field come together for a multi-day workshop to provide input about the specific tasks, knowledge, and skills needed to perform their job.

In 2013, the DOE asked the National Institute of Building Sciences (NIBS) to help them develop voluntary national guidelines, known as the *Better Buildings Workforce Guidelines (BBWG)*. The Institute established the Commercial Workforce Credentialing Council (CWCC) to lead the development of those guidelines for five key job titles: Building Energy Auditor; Building Commissioning Professional; Energy Manager;

Building Operations Professional and Facility Manager. In addition to these job titles, the addition of Test, Adjust and Balance Professional has also been discussed during multiple occasions. The purpose of the *Better Buildings Workforce Guidelines* is to assist certification programs, workers, employers, building owners, and managers, energy efficiency program administrators, and government officials in developing and identifying a more consistent and comparable workforce.

The Institute formed a Board of Directors and a Board of Advisors to oversee the CWCC. Members of the CWCC Board of Advisors include: NEBB, ACG, TABB, AIA, ASHRAE, AEE, ASTM, BOMI, BCA, International, Building Commissioning Association (BCA), IFMA, PECL, and many other organizations.

The Institute received over 200 applications for SMEs for the Building Commissioning Professional JTAs. Fifteen applicants were selected including a representative of the AIA. The Building Commissioning Professional JTA Workshop was held on February 19-21, 2014 in Orlando, FL. NEBB's Steve Wiggins and Jim Bochat were selected as SMEs and participated in those workshops. NEBB's Rick Farrington and Mike Locke also participated as SME's as the DACUM was developed so NEBB was well represented in the program.

The NEBB Commissioning Process Certified Professional (CxPP) certification will be DOE recognized; all certificants will meet any specification calling for "certification recognized by the Department of Energy through its Better Buildings Workforce Guidelines project." In developing the CxPP certification program, NEBB used the Commissioning Professional Better Buildings Workforce Guidelines Certification Scheme. NEBB submitted its preliminary application for ANSI Accreditation for the CxPP certification under ISO/IEC 17024 and is now in the process of completing the final application process which should be completed in 2016.

The Department of Energy (DOE) and General Services Administration (GSA) will recognize our CxPP certification as high quality, industry endorsed, and nationally recognized. This is a personnel certification program; there is no Firm Certification available for the CxPP program at this time. This program does not replace NEBB's Technical Commissioning and Retro-Commissioning certifications or disciplines.

If performing commissioning work in government facilities, this certification will be required. Like many Government programs, successful implementation of the program will spread to the states and other jurisdictions. There is no question that the DOE requirements will be successful; in fact, the DOE did not announce a new deadline for their program because the industry organizations have already shifted to the ANSI/ISO scheme faster than even the DOE anticipated.

The good news is that NEBB currently has a great opportunity for any interested candidate who meets the certification requirements. For a limited time, the certification is being offered at a greatly reduced cost of \$150, which includes application fees and exam fees. The exam can be taken at your local Kryterion Testing Center. Also available at a steep discount is the *CxPP Sourcebook*, which includes the recommended reading materials for qualified candidates preparing for the NEBB CxPP certification examination. The *CxPP Sourcebook*, available for a limited time for only \$150, is a compilation of handbooks, guidelines, and standards, including the following:

- *NEBB CxPP Candidate Handbook*
- NIBS Job/Task Analysis (JTA) Dacum Chart for Building Commissioning Professionals
- *ASHRAE Standard 202-2013 Commissioning Process for Building and Systems*
- *ASHRAE Guideline 0-2013 The Commissioning Process*
- *ASHRAE Guideline 1.1-2007 HVAC&R Technical Requirements for the Commissioning Process*
- *ASHRAE Guideline 1.5-2012 The Commissioning Process for Smoke Control Systems*
- *ASHRAE Guideline 0.2-2015, Commissioning Process for Existing Systems and Assemblies*
- *ASHRAE's Performance Measurement Protocols for Commercial Buildings: Best Practices Guide*

To obtain NEBB's CxPP certification application and program details, please email certification@nebb.org or visit www.nebb.org. ■

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Changing Belt Driven Fan Speeds

Leonard Maiani | NEBB Technical Director (Former/Retired)



One of the duties normally assigned to the TAB firm on a TAB project is to make final adjustments to fan speeds to achieve design air flow. Doing so, professionally, will result in the system performing as close to design as the installed equipment will provide.

NOTE: This discussion is for fan speed change only and does not account for other unit components such as cooling coils, etc. These applications may require additional consideration when speeding up or slowing down a fan.

Considerations when changing a fan's speed:

1. Motor Horsepower
2. Manufacturer's documented maximum speed
3. Fan and motor sheave sizes
4. Number and type of belts
5. Motor wire size
6. Starter/disconnect size
7. Overload size

REDUCING FAN SPEED

Slowing the fan speed down is the safest, while speeding the fan up involves a bit of research to assure that all components are operating safely.

When slowing a fan down, items 1, 2, and 4 thru 7 do not play into your decision as to how much to slow it down. Items 3 & 4, however, do require some thought. The motor or drive sheave, when changed, should not be so small that there is insufficient belt contact to drive the fan without slippage. When the fan sheave is changed, care should be taken to not exceed the dimensions of the cabinet or belt guard and should not come into contact with the drive or motor sheave. Belts should be selected to provide for future adjustment of tension as they wear in. The number of belts should NOT be reduced due to slowing the fan down. The entire drive package is sized to meet the specified percentage above the nameplate motor horsepower (e.g. 150% of motor horsepower). The belt tension should be adjusted to the manufacturer's recommended tension to ensure the longevity of the drive package. All belt manufacturers recommend re-adjustment of tension shortly after installation of

the new belts (e.g. 24 hours of operation). This information should be passed on via notes in the TAB report or conveyed to the maintenance staff at some point.

Where the drive package consists of more than one belt, the belts should be ordered as a matched set. Some belt manufacturers do not require this. In any case, the actual belt lengths must match.

INCREASING FAN SPEED

When speeding a fan up, all seven items, in the list above, come into play. Brake horsepower increases as the cube of the change in fan speed. In other words, a 10% increase in fan speed will result in a 33% increase in brake horsepower. The TAB firm must never exceed the nameplate horsepower when speeding a fan up. The TAB firm must research the fan manufacturer's data to ascertain the maximum operating RPM of the fan and must never exceed this RPM or damage to the fan may occur.

If it is determined that an increase in speed (without exceeding the maximum RPM) would require a change in motor horsepower, then a complete check of the electrical service to the motor would be required to ascertain that the components and wiring are adequate or need to be upgraded to meet the requirements of a new, larger, motor. Also, when increasing the motor horsepower, the drive package (number and size of belts) needs to be reviewed to meet the project specification. If there is no specified requirement, the drive package should be sized between 130% and 150% of the new motor nameplate. At this point, the belt guard may need to be modified as well.

If additional belts are required to accommodate the higher motor nameplate horsepower, it will be the TAB firm's responsibility to see that the specification is met. If the drive package is provided by the vendor or contractor, any discrepancies in what they provided should be reported in the TAB report.

When all is said and done, the fan speed should deliver design air flow with the motor running at or below nameplate brake horsepower and somewhat below the manufacturer's rated maximum RPM.

GENERAL COMMENTS

1. Do not roll the belts off and on the sheaves while they are under tension. Relieve the tension prior to belt removal or replacement.
2. Use Pitch Diameter (PD) when calculating sheave diameters and belt lengths. (Outside diameters vary between manufacturers.)
3. Double check sheave bore sizes before ordering replacement sheaves. If the sheave or bushings are not marked, it is best to use a caliper to check shaft diameters. The chamfer on the end of the shaft could easily skew a reading with a tape measure.
4. If belts squeal or slip on startup when belts are properly tensioned, note that this is occurring in the TAB report and recommend a different drive package to resolve problem. This is not as critical on 24/7 projects where fans run continuously, such as hospitals, but where systems are on a timed schedule or sequenced on and off, this could dramatically shorten the life of the belts and drive sheave.
5. Recommend against the use of belt dressings. This a stopgap at best. Belt dressing dries the belt and shortens life expectancy.
6. Whenever a fan is shipped with a companion sheave on the fan shaft, it should be replaced with a companion sheave. A standard driven sheave will put undue stress on the outer belts of a multi-belt drive.
7. Verify that all set screws are tight and taper bushing bolts are tightened evenly and to the proper torque. (Over torquing can make for a long day when one or more bolts snaps off in the sheave.)
8. When installing a sheave with a taper bushing, verify that the sheave runs true with no wobble. Uneven tightening of the bolts can cause it to run with a wobble.
9. Final sheave alignment is critical to the life of the drive components. Use a straight edge or string to verify proper alignment. (Banded, gear-belt, and micro V belt drives require detailed attention to alignment and tension. Follow Manufacturer's instructions.)
10. Over-tensioning of belts, to eliminate noise or slippage can result in premature failure of either the fan or motor bearings or both. Verify that the proper belts and tension are as they should be.
11. Change out belts like for like. Notched belts do not have the same horsepower rating as standard sheathed belts.
12. Banded belts should only be installed on new sheaves. If the sheaves are worn, they may cut through the banding.
13. Report any anomalies or discrepancies observed during and after the speed change such as; increased noise, excess vibration, throbbing noise, oil canning of duct work, deforming of duct work, etc.

14. Do not leave fan motors overloaded under any circumstances unless directed IN WRITING by the specifying agency.

SAFETY CONCERNS

1. Observe Lock-out/Tag-out protocol.
2. Wear snug fitting clothing and short sleeves when possible to avoid clothing being caught in the drive package when in operation.
3. If you must wear a tie, make it a clip-on or modify a standard tie with a Velcro release at the back of your neck.
4. Corral the ponytail. If you have long hair, keep it tucked into a cap or some other restraint.
5. Do not put your fingers on the underside of the belts when installing the belts. Rolling belts on under tension really exacerbates this hazard.
6. Keep body parts out of the line of fire if one or more belts break or otherwise jump off the sheave on startup. ■

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Marketing Refresher: *Back to Basics*

By David Kirkham | NEBB Marketing Committee

Websites, business cards, and brochures, like it or not, have become what establishes the legitimacy of our companies in the marketplace. Fortunately, all are relatively inexpensive these days as well as quick and easy to produce. However, *having* them is one thing, *effectively using* them is another.

Websites

Having an internet presence is important if not essential. It doesn't necessarily have to be fancy, you just need to be there. On larger projects, you should assume that the awarding party will do a little cyber homework on your company. If someone is looking for expertise in your field, they'll "Google" it. Being in the results of that search is a huge advantage. If someone goes to NEBB's website and searches the directory, will they find you there? Unfortunately, it is not likely, here's why:

- Total NEBB firms listed: 662
- Number of those firms with websites listed: 171 (26%)
- Number of the firms with website links that don't work: 15

Contact the NEBB office and they'll gladly post your website link in the directory.

Using your internet presence is simple. Insert your website address into your email signature, on your report forms, on your business cards – pretty much anywhere you can. On your website itself, post pictures, downloadable resumes, and brochures, and an email link to you or your company.

Business cards

These cost about \$10.00 for 500. No matter what your marketing budget is, you can afford this. Two simple rules:

- Keep them everywhere: every vehicle you own, every coat you wear, every portfolio you use. This list is endless.

- Leave them everywhere: job meetings, stapled to hard copies of reports, proposals, the bulletin board in the University maintenance facility, the bowl for the monthly drawing at the Chinese restaurant. This list is endless as well.

It's never a good moment when someone asks for your business card and you don't have one.

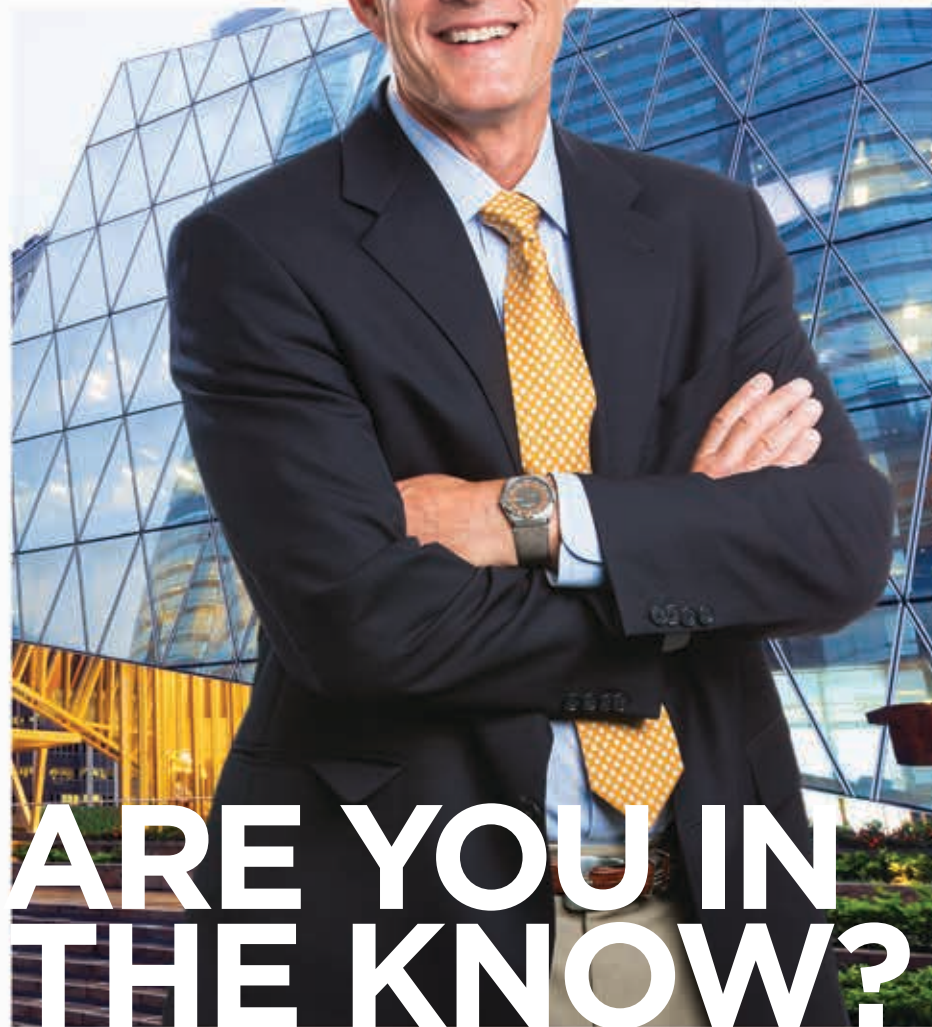
Brochures

Brochures are a valuable marketing tool. They tell more than a business card can, and easily answer the question, "Can you tell me more about your company?" These are also relatively inexpensive and can be produced and purchased in a variety of bi-fold and tri-fold designs. It's a good idea to keep plenty of these in the same places you keep your business cards.

When a more "in depth" look at your company is required, company portfolios are usually presented. It's a good idea to have a working file that can be updated quarterly to reflect recent projects and personnel changes. It's also a good idea to maintain a current stock of letters of recommendation to include in the portfolio. Scrambling to update and assemble these at the last minute is never a fun adventure. Brochures and portfolios are also good items to have available as downloads on your website.

Marketing doesn't have to be an expensive, laborious process. By effectively using the items you have at hand, you can increase the exposure of your company and services.





“

The education sessions offered at the BOMA Conference provide a wide variety of topics but most important to me was the interaction between the presenters and participants. The knowledge, insight and experience each brings to the conference is absolutely invaluable, giving you the benefit of a different perspective.

Wade Lange, CPM, RPA, FMA,
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NEBB Discipline Reports

NEBB Disciplines are supported by volunteer experts in areas of specialized high building performance areas. Each group is committed to continued growth and keeping NEBB Certification programs the GOLD Technical Standard in each specialty.

BET

Building Enclosure Testing (BET) Committee

Phil Emory, Chairman
Neudorfer Engineers, Inc.

The group is looking forward to welcoming new member Mike Peak of Testcomm to the BET Committee. They would like to thank Mike for stepping up and into service. The Committee is working on preparing the educational content for the upcoming seminar in Albuquerque, NM, April 11-13, 2016. Registration available at www.nebb.org

BSC

Building Systems Commissioning (BSC) Committee

Jim Bochat, Chairman
Commissioning Concepts

This last quarter, the BSC Technician Sub-committee held the Beta seminar November 2nd through the 4th of 2015. Even though this was a Beta class with new instructors the student's reviews were highly complementary of the instructors and materials. There were further discussions to improve the content of the final test.

The committee is working on having the new RCx standard out for public review after their January face-to-face meeting at ASHRAE in Orlando.

The Committee will be pursuing the following goals over the next three months:

- RCx ANSI Standard. Final draft should be approved very soon. It is planned to release this draft to the NEBB BOD and NEBB Certification BOD by 01-08-16 to 02-28-16 for a NEBB internal review. After approved by the BOD it will be ready to submit to ANSI for peer review.

- While the RCx ANSI Standard is going through the peer review process we will be finishing the RCx Handbook.
- After the RCx ANSI Standard is complete the committee will begin the BSC ANSI Standard and Handbook. This will be a much larger project than the RCx standard because it has so many disciplines in the standard.

CPT

Cleanroom Performance Testing (CPT) Committee

Patrick C. Law, Chairman
Hepatest, Inc.

The CPT committee has been quite busy. In 2015 the Committee held a CPT Professional Seminar in North Carolina and administered CPT Professional exams in North Carolina, Washington, DC, Connecticut, and Australia.

In addition, the committee has completed and revised the CPT Certified Professional practical exam, and is currently reviewing their Home Study Course.

The CPT committee constantly evaluates changes in the industry to assure that the CPT Procedural Standards stay current with the industry. As an example, committee members attended a course relating to USP 797 to stay current with regulations for compounding environments.

So far this year, the CPT committee has schedule to hold a CPT Certified Technician Seminar in May as well as a CPT Certified Professional seminar later in the year. Registration and additional information can be found at www.nebb.org.

FHT

Fume Hood Testing (FHT) Committee

Don Fedyk, Chairman
Air Filtration Management

Some changes going on at the FHT Committee. Don Fedyk is stepping down as the Chairman to take a new position with NEBB and will be replaced by knowledgeable and long-time member Michael Kelly who will be very busy with David

Muggah and corresponding member Rob Chopowick. Any individuals interested in volunteering for the FHT committee can contact either Mike Kelly or David Muggah. Contact information is on the NEBB website: www.nebb.org.

Final approval of the ASHRAE-110 Method of Testing Fume Hoods will present some modifications to the NEBB FHT PS along with changes incorporated by the committee for a Revised PS in 2016. A seminar, including written and practical examinations, is being offered at Labconco, in Kansas City, MS from March 14-18. There will also be a second seminar being offered in September with exact dates to be published shortly. Registration and other details can be found at www.nebb.org.



Sound & Vibration (S&V) Committee

Kevin Gaghan, Chairman
Gaghan Mechanical, Inc.

The S&V Committee is working on standardizing regional test rigs for S&V at existing testing facilities. They are working to review existing equipment at different labs within NEBB Chapters to determine sites available for conducting sound and vibration practical tests. After much consideration and study, two testing facilities were deemed acceptable for S&V classroom and practical testing. Other facilities will be reviewed for possible approval as Chapters submit lab equipment available (fans, pumps, etc.).

The latest proposed S&V Procedural Standards have been approved and are available for download and/or purchase from NEBB website.



Testing, Adjusting & Balancing (TAB) Committee

Steve Clark, Chairman
Clark Balancing Ltd.

The TAB Committee is currently reviewing the required instrument list as published for accuracy and will be discussing changes to make recertification a smoother and easier task for firms. This is also being done to ensure inclusion of many good manufacturers and instrumentation in our standard.

Concurrently, the group is committed to a complete review and update of the *TAB Technicians Handbook* as well as the *TAB Home Study Course*. Both publications, while well written and still useful, require revisions with new technology and methodology.

The committee continues to expand and develop training materials for seminars and future online offerings.

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NEBB NEWS

Don Fedyk Named NEBB Technical Director



Bohdan “Don” Fedyk has joined NEBB staff as the organization’s new Technical Director. He succeeds Leonard Maiani, who retired at the end of 2015.

Fedyk is well known in NEBB circles. He served several years on the NEBB Board of Directors, as well as Chairman of the NEBB

Fume Hood Testing (FHT) Committee. Fedyk is a NEBB Certified Professional in FHT, BSC, TAB and S&V.

Fedyk’s professional career began in 1985 as a TAB journeyman, after having served in the United States Army in Panama and the Republic of Vietnam. He most recently worked as Manager, Laboratory Systems Commissioning/Validation, FHT/BSC Performance Certification, for Air Filtration Management, Inc. of New York. Fedyk is active in professional organizations, including as a current member of ASHRAE’s SPC 100 Committee for fume hood performance testing.

“We are thrilled to have Don join our professional staff,” said Glenn Fellman, NEBB Executive Vice President. “His wealth of knowledge and ability to impart complex technical information in any easy to understand manner made him the perfect candidate for the position,” Fellman added.

Fedyk is a resident of Buffalo, New York, NY and is a full-time, telecommuting NEBB employee. He can be reached at don@nebb.org or (301) 591-0487.

NEBB Certification Board Garners New Appointees

NEBB Certification Board Chairman Stanley Fleischer, with the approval of the Certification Board (CB), announced the appointment of two new members to the CB: Ted Salkin, Director of Commissioning, NORESO, Mt. Laurel, NJ, and

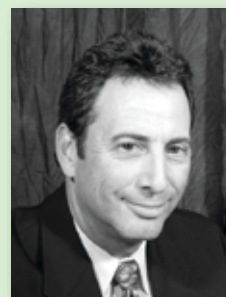
Brian Keller, Director of Commissioning, Cleary Zimmermann Engineers, San Antonio, TX.

Both gentlemen were appointed to the CB and will serve two-year terms with the option of serving additional terms. Salkin was named Chairman of the Compliance Committee, and Keller was named Chairman of the Exam Writing Committee, formerly chaired by current CB Vice Chairman Rick Farrington.



Brian Keller

“Ted has served NEBB in various leadership capacities in the past, including a term as NEBB President, and we are so pleased to have him involved again. Brian has served diligently for 15 months on the Exam Writing Committee, and he brings a wealth of knowledge to the group,” said Stanley Fleischer, CB Chair. “The Certification Board is honored to have professionals like Ted and Brian serve with us within NEBB’s certification realm.”



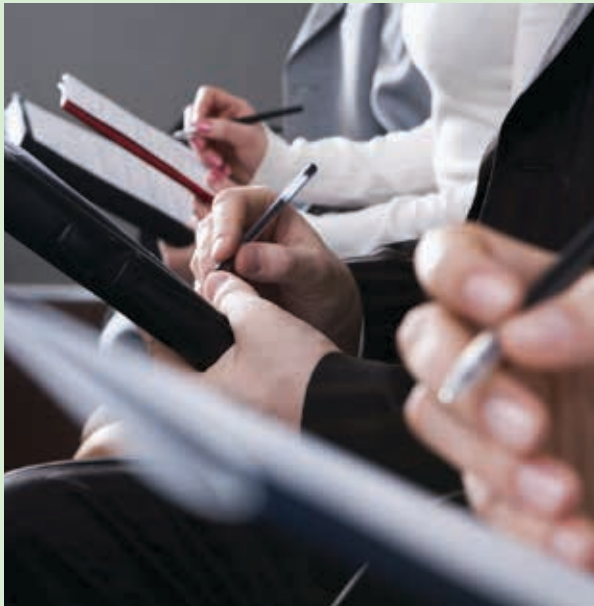
Ted Salkin

Plan Ahead: Exams in Albuquerque!

This year, NEBB will again offer **pre-approved candidates** the opportunity to sit for various written exams and written practical exams at the 2016 Annual Conference in Albuquerque, NM. If you’ve been thinking of pursuing certification in a specific discipline, or are halfway completed with the application process, now’s the time to plan ahead and set things in motion.

NEBB Exams

For those pursuing any of NEBB’s certifications, particularly the CxPP, please note that the exam testing application and pre-requisite requirements must be submitted via email to



certification@nebb.org on or before March 15, 2016 in order to receive approval to sit for the exams, both written and the written practical.

Exams will be offered for both the Certified Professional and Certified Technician. Retests can be scheduled as well, if within the appropriate time frame. Candidates are allowed to retest after the 90-day waiting period. **Exams will be held Sunday, April 17, 2016, from 8:00 am to 5:00 pm, with Exam Sign-in from 7:00 am to 7:45 am;** exams will be proctored by NEBB Staff. A complete listing of exams offered for testing will be listed at www.nebb.org in the near future.

Special Building Enclosure Testing Exam Day

For those interested in achieving the Building Enclosure Testing (BET) certification, a two-day workshop will be held Monday, April 10 and Tuesday, April 11 with the BET written and written practical scheduled on Wednesday, April 12, from 8:00 am to 5:00 pm, proctored by NEBB Certification Staff. Those planning to sit for the BET exam must have their application completed and emailed to certification@nebb.org on or before March 15, 2016.

Plan Today for Exams Tomorrow!

Please note that due to the amount of time required to properly process and approve certification applications and exam paperwork, exam walk-ins will not be accepted or processed onsite in Albuquerque, NM. All paperwork must be filed and completed by **March 15, 2016** in order to sit for an exam. Only candidates who have been pre-approved and have submitted exam paperwork and paid for the exam may sit for an exam in Albuquerque.

For more information, please feel free to email certification@nebb.org.

In Memoriam

It is with deep regret that we report the death of the following NEBB stakeholder. NEBB is honored to recognize those that contributed to the NEBB organization and the field of balancing and commissioning. Please note that this information is only that which has been volunteered to us by colleagues, friends, and family. Please feel free to email the NEBB Communications Staff to share additional information on a deceased certificant or stakeholder for future recognition.



Jack R. Deye passed away, Sunday, November 15, 2015 at the age of 88 years. He leaves behind his wife Rita of 51 years, his child Nicki, three grandchildren, and four great grandchildren.

The John F. Deye Company, started in 1952 and Mr. Deye became President in the 1970's. He worked with the company to become a NEBB Certified Firm in Testing and Balancing. He closed his sheet metal business in 2012 and went to work with Jack McDonald at Jacobs Mechanical and was active and engaged on balancing jobs.

Mr. Deye was a NEBB Certified Professional and active with NEBB until the time of his passing. He became NEBB certified for TAB (Air & Water) in 1974 and rose to leadership in Ohio Kentucky EBB, formerly the Southwest Ohio EBB, acting as President from 1984 to 1994. He received a pin for 25 plus years of service from NEBB in 2001.



Before his long career as a NEBB Professional, Jack Deye served in the NAVY. Serving three years on a battleship and a submarine.

Calendar of Upcoming Events

For more information visit www.nebb.org

March

- MARCH 14-18, 2016
NEBB Fume Hood Testing Seminar and Optional Exam for Certified Professionals
- MARCH 21-24, 2016
NEBB Building Systems Commissioning Certified Professional Training/Seminar and Optional Exam

April

- APRIL 11-13, 2016
NEBB Building Enclosure Testing Certified Professional Seminar and Optional Exam
- APRIL 14-16, 2016 2016
NEBB Annual Conference
- APRIL 25-28, 2016
NEBB Retro-Commissioning Certified Professional Training/Seminar and Optional Exam

May

- MAY 10-12, 2016
NEBB Cleanroom Performance Testing Certified Technician Seminar and Optional Exam
- MAY 13, 2016
Southern CA EBB Chapter Recertification Seminar

June

- JUNE 06-09, 2016
NEBB TAB Certified Professional Review Seminar & Optional Exam
- JUNE 06-10, 2016
NEBB Sound and Vibration Certified Professional Seminar & Optional Exam

September

- SEPTEMBER 19-23, 2016
NEBB Fume Hood Testing Seminar and Optional Exam for Certified Professionals
- SEPTEMBER 20-22, 2016
NEBB Building Enclosure Testing Certified Professional Seminar and Optional Exam
- SEPTEMBER 26-30, 2016
NEBB TAB Certified Professional Review Seminar and Optional Exam

October

- OCTOBER 03-06, 2016
NEBB Cleanroom Performance Testing (CPT) Certified Professional Seminar and Optional Exam
- OCTOBER 03-07, 2016
NEBB Sound and Vibration Certified Professional Seminar and Optional Exam

● NEBB Annual Conference

● NEBB Seminars

● Chapter Meetings

Last Call!



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A wide range of sponsorship opportunities are still available to **build your relationships within the valuable NEBB community** of expert commissioning professionals. Read more at the detailed [2016 NEBB Sponsorship Brochure](http://www.nebb.org) at www.nebb.org.

The NEBB Annual Conference attracts NEBB members, company leaders and executives. The opening session includes keynote address by industry leaders, followed by technical sessions and a vendor exhibit which provides a landscape of emerging technologies and products.

As a sponsor, you will receive:

- Acknowledgment in attendee materials as official conference sponsor
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- Onsite event signage highlighting your sponsorship

Please respond with your sponsorship confirmation by **February 29, 2016**.

Interested parties are encouraged to contact Cheryl Gendron, Director of Communications & Events at cheryl@nebb.org.

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Current Call for Abstracts/Presentation Opportunities

2016 I2SL Annual Conference

Kansas City, MO, on September 25-28, 2016
Abstracts/Presentations Submission Period through Friday, March 18, 2016

IFMA's World Workplace

San Diego, CA, on October 5-7, 2016
Abstracts/Presentations Submission Period through Mid-March 2016
Details and Application available at <http://worldworkplace.ifma.org/about/apply-to-present>



2017 ASHRAE Winter Conference

Las Vegas, NV, on Jan. 28-Feb. 1, 2017
Details at www.ashrae.org/lasvegas
Abstracts Submission Period through March 14, 2016;
Full Technical Papers are due April 18, 2016

Do you have an organization where a NEBB Certificant could present? Please share any opportunities along with deadlines for your affiliated organizations: Email communications@nebb.org. The world needs to know about the NEBB difference – Expertise and Technical. Help us spread the word and help yourself boost your visibility and your career!



Agenda at a Glance

Monday, April 11

8:00 a.m. – 5:00 p.m. ***NEBB Building Enclosure Testing Seminar (BET) for Certified Professionals**

Tuesday, April 12

8:00 a.m. – 5:00 p.m. ***NEBB Building Enclosure Testing Seminar (BET) for Certified Professionals**

9:00 a.m. – 5:00 p.m. ***Optional Tour: Santa Fe via the Turquoise Trail**

8:00 a.m. – 5:00 p.m. Closed Committee Meetings: TBD

Wednesday, April 13

8:00 a.m. – 12:00 p.m.	*NEBB BET CP Optional Exam
7:00 a.m. – 5:00 p.m.	Conference Registration Opens
7:00 a.m. – 5:00 p.m.	Closed Committee Meetings: TBD
7:00 a.m. – 2:00 p.m.	*Golf Tournament
4:00 p.m. – 5:00 p.m.	NEBB Past Presidents' Meeting

Thursday, April 14

7:00 a.m. – 5:00 p.m.	Conference Registration Open
7:00 a.m. – 3:00 p.m.	Closed/Open Committee Meetings: TBD
9:00 a.m. – 10:00 a.m.	**Guests Breakfast: Discover Albuquerque
11:00 a.m. – 4:00 p.m.	**Guests Invited: Explore Albuquerque (Transport available)
1:00 p.m. – 5:00 p.m.	Vendor Exhibits Open
10:00 a.m. – 11:30 a.m.	Examiners Orientation & Training: 2016 TAB Practical Exam Guidelines
5:00 p.m. – 6:30 p.m.	Opening Session: Welcome and Keynote Presentation
6:30 p.m. – 10:00 p.m.	Get Acquainted Reception

Friday, April 15

6:30 a.m. – 8:00 a.m.	Continental Breakfast for Conference Attendees
7:00 a.m. – 5:30 p.m.	Conference Registration Open
7:00 a.m. – 5:00 p.m.	Vendor Exhibits Open
8:00 a.m. – 4:00 p.m.	*Optional Guest Tour: Acoma "Sky City" Pueblo and Artisan Winery
8:00 a.m. – 3:45 p.m.	Technical Sessions
8:00 a.m. – 5:00 p.m.	Chapter Coordinators Meeting
11:15 a.m. – 12:30 p.m.	Lunch for all Conference Attendees
3:45 p.m. – 5:30 p.m.	Vendor Hosted Reception (All Conference Attendees are Welcomed) 1 CEC

Saturday, April 16

6:30 a.m. – 8:00 a.m.	Continental Breakfast for Conference Attendees
7:00 a.m. – 4:00 p.m.	Conference Registration
7:00 a.m. – 4:00 p.m.	Vendor Exhibits Available
8:00 a.m. – 9:30 a.m.	NEBB Business Meeting & Town Hall
8:00 a.m. – 4:00 p.m.	Chapter Coordinators Meeting
9:45 a.m. – 3:45 p.m.	Technical Sessions
11:15 a.m. – 12:30 p.m.	Lunch for all Conference Attendees
4:00 p.m. – 5:30 p.m.	Closing Session (Presentations, Awards and Adjournment) 1 CEC

Sunday, April 17

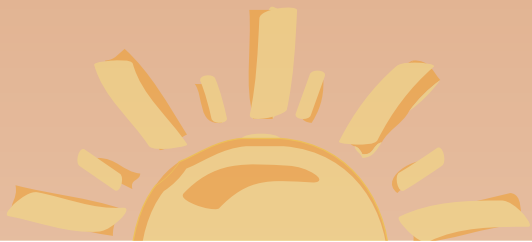
8:00 a.m. – 5:00 p.m.	Board of Directors Meeting
8:00 a.m. – 1:00 p.m.	*NEBB Certification Exam Testing Day

Register for both the Annual Conference AND the BET Seminar and receive a \$200 discount on combined registration fees. Visit www.nebb.org for seminar brochure and registration information.

***BET CP Exam fees are separate.**

* Separate registration required
** Included with Guest Registration

Schedule subject to change.



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Please plan on visiting our Vendor Partners! Exhibits will be set up for learning opportunities between sessions. The following Vendor Partners have signed up with more to come!

- **Ameritech Computer Consultants, Inc.**
- **Building Start**
- **Dwyer, Inc.**
- **IMI Hydronic Engineering, Inc.**
- **Instruments Direct**
- **ONICON, Inc.**
- **Oriflow**
- **ProHydronic Specialties**
- **Retrotec**
- **Shortridge Instruments**
- **The Energy Conservatory (TEC)**
- **TSI, Inc.**
- **XOperative TAB**

Special Activities

NEBB 19TH ANNUAL GOLF TOURNAMENT Sponsored by TSI, Inc.

Wednesday, April 13, 2016

NEBB meeting attendees are invited to join their colleagues for the 19th year of the Annual Golf Tournament.

The golf tournament is being held at the Sandia Golf Club. Golfers will enjoy an 8:00 a.m. shotgun start.

The Sandia Gold Club—New Mexico's treasure—is nestled in the rolling foothills of the Sandia Mountain Range, only 20 minutes from downtown Albuquerque. Stretching from 5,113 yards to 7,772 yards from the back tees, the Par 72 Championship Course will challenge and delight our participants with a memorable layout routed through the rugged high desert landscape with 48 strategically placed bunkers and challenging green complexes.

Golf registration is \$120 and includes round-trip transportation from the hotel to the Golf club, green fees, cart fees, scorecards, water, rules sheets, locker room facilities, contest holes, souvenirs, and tournament scoring. A light breakfast will be provided at the course. Contests will include a hole-in-one at all par 3s, closest to the pin and longest drive. Golf Club rentals are available (limited) and arrangements must be made in advance of the tournament. Club rentals are \$40.

Sandia Golf Club
30 Rainbow Road
Albuquerque, New Mexico 87113
Website: www.sandiagolf.com

The golf tournament will be held subject to weather conditions.



GET ACQUAINTED RECEPTION



Get Your Kicks on Route 66! The NEBB “Get Acquainted Reception” is your time to mix and mingle with NEBB and industry professionals, meet new acquaintances, and reconnect with long-standing friends.

You will enjoy a taste of “the iconic Route 66” - where you will enjoy delicious cocktails and savory hors d’oeuvres from along this historic byway. This fun filled evening will be an adventure in

sights, sounds, and tastes! Come escape with the brightest minds in the building performance industry. This reception promises to be one that you don’t want to miss.

Especially for our Guests

MORNING BREAKFAST SESSION

Thursday, April 14, 2016

Discover Albuquerque

All NEBB Conference Guests are invited to join us for this delicious and informative morning session. This breakfast session will have everything you need to energize and make the most of your day including nutritious food, good conversation and a speaker focusing on “Discovering Albuquerque.” A representative from Albuquerque’s Convention and Visitor’s Bureau will present on the best the area has to offer: shopping, restaurants, museums and more. You can then take your knowledge “On the Road!”

Explore Albuquerque

A shuttle will be available in a continuous loop around the downtown from 11:00 a.m. – 4:00 p.m. It will be running from the Hyatt Hotel to various points of interest throughout the downtown area, including the historic Old Town square and the Nobb Hill shopping district.

The cost of this session & area transport is included in the Guest Registration Fee.

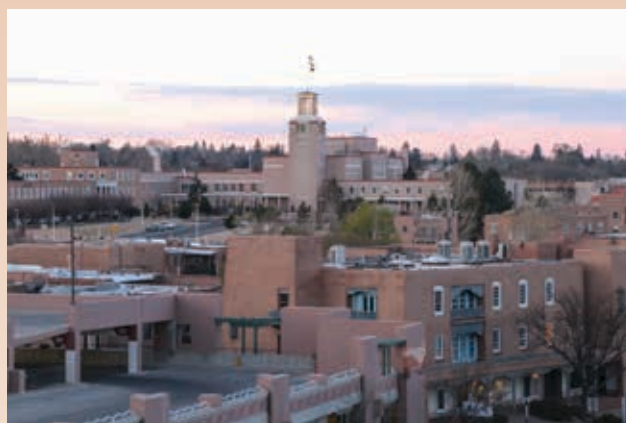


TOUR OF SANTA FE (Optional)

Before the Conference – Tuesday, April 12, 2016

Visiting America’s beautiful Southwest would not be complete without a side trip to the unique and renowned city of Santa Fe.

This optional tour includes a trip along the historic Turquoise Trail National Scenic Byway. This route links Albuquerque and Santa Fe and encompasses 15,000 square miles in the heart of central New Mexico. You will drive back into history through the mining towns of Golden, Madrid, and Cerrillos, whose mines once yielded gold, silver, turquoise, lead, zinc, and turquoise. During its heyday in the 1880s, Cerrillos boasted twenty-one saloons, and four hotels. A renewed spirit has brought art, crafts, theater, music, museums, and restaurants to these towns. Enjoy a forty-five minute stop to explore Madrid and perhaps do some shopping.



Upon arrival in Santa Fe you may take an optional guided walking tour, visiting such points of interest as the historic Plaza, St. Francis Cathedral, the Loretto Chapel, with its famous “miraculous” staircase, and the San Miguel Mission. Founded in 1610, Santa Fe was the last stop on the Camino Real, the fabled Royal Road that stretched from Mexico City to the northernmost reaches of the Spanish



Empire. Today it is the heart and soul of the Southwest, and “Santa Fe Style” is synonymous with all the best the region has to offer. Its historic Plaza, winding streets, covered arcades, hidden gardens and courtyards, and Pueblo-style architecture reflect the blending of Indian, Hispanic, and Anglo cultures.

Attendees will enjoy lunch on their own at one of the many restaurants in the Plaza area. Your guide will provide maps and offer suggestions. After lunch you may continue to explore on your own or indulge in a southwestern shopping spree at the many unique specialty stores and galleries around the Plaza.

Nearly all the city's main cultural attractions are also within walking distance of the Plaza, including the Georgia O'Keeffe Museum and the Palace of the Governors.

Cost: \$68 per person.

PRICE INCLUDES: Transportation, professional tour guide, walking tour of Santa Fe Plaza area, admission to Loretto Chapel and San Miguel Mission, bottled water on coach, guide and driver gratuities, and all applicable taxes.

ACOMA PUEBLO AND ARTISAN WINERY (Optional)

Guests only – Friday, April 15, 2016



This day tour is designed to capture the best of the Southwest and includes a full day, with transport to a historic park and an exquisite winery.

The Acoma Pueblo, known as "Sky City," is located in the spectacular West-Central Plateau of New Mexico. Acoma Pueblo, situated 350 feet above an outstretched valley atop a massive sandstone mesa at 7,000 feet above sea level, is the oldest continuously inhabited settlement in the United States. Archaeologists put the initial occupation of the Pueblo around 1150 AD. The first Europeans, led by Francisco Vasquez de Coronado, visited Acoma in 1540.

A Pueblo member will take you on a ¾-mile leisurely guided tour of the village, explaining the culture and history of the tribe. Points of interest include San Estevan del Rey Mission, built in 1629, the largest and most remarkable of all the Spanish Colonial mission churches in New Mexico. All building materials for the church and other structures in the village were carried or hauled great distances by



hand up the steep slope of the mesa. The 360-degree views from Acoma are breathtaking and offer many photo opportunities.

After the tour you will enjoy a hosted buffet lunch at Sky City Casino.

Next it's on to one of the most beautiful wineries in the southwest, Casa Rondeña Winery, for a private tour and wine tasting. New Mexico's sun soaked soil and cool high desert nights are nearly perfect for the cultivation of grapes and have contributed to the recent revival of wine making in one of the nation's oldest wine producing regions. Enjoy a delicious cheese and fruit platter while sampling these fine wines.

Cost: \$125 per person.

PRICE INCLUDES: Deluxe motor coach transportation, professional tour guide, admission to Acoma and guided tour of Pueblo with camera permit, buffet lunch at Sky City Casino, tour and wine tasting at artisan winery, bottled water on coach, driver gratuity, and all applicable taxes.





Sessions and Speakers Bios

KEYNOTE OPENING SESSION

Connecting with People in a Gadget-Crazy World

1 CEC Join your fellow NEBB Members and colleagues for the exciting opening keynote session at the Annual Conference with speaker Thom Singer. Sharing his multitudes of experiences as a speaker and author, he will discuss many of his networking strategies and how to enhance your business relationships.

All business is personal, but it takes time to establish meaningful connections. If you are not top of mind, then your competition gets the call for the next piece of business, and in our social media-crazy world, connecting with co-workers, clients, vendors, peers and others is more complicated than ever before.

The quest for more productivity pushes us to increasingly use digital and social media tools to interact with others. With these ever-evolving changes in how we communicate, are we really better connected? While social media tools are great, it can remove the personal side of a relationship. Thom will take us on a journey of exploration about how we can maximize our online brand and reputation in a world where everyone is looking at their electronic gadgets instead of looking other people in they eyes.

- Discover how to focus your 2016 efforts on finding the ROI of your networking activities
- Assess the real benefits of networking and social media (beyond a “like”, “link”, “share” or “follow”)
- Identify new methods to follow up with people you meet in business situations

- Determine how to make the right choices in allocating time to people
- Evaluate ways to strengthen connections that lead to mutually beneficial referrals

This presentation is an ideal way to start your experience at the Annual Conference. Be prepared to change the way you look at networking and to make new connections with people and be fully engaged during your time in Albuquerque.



Thom Singer, CSP

Thom Singer has an eclectic background working in sales, marketing and business development roles for Fortune 500 Companies, Law Firms, and entrepreneurial ventures. He believes that all opportunities come from people, and when we work together to find “cooperative significance” with others we all discover more success.

Singer is a professional master of ceremonies, speaker, trainer, consultant and the author of eleven books on the power of business relationships, business development, entrepreneurship, legal marketing and presentation skills.

He speaks regularly at business and association conferences around the United States and beyond.

He is also the host of the widely popular “Cool Things Entrepreneurs Do” podcast. On this show he interviews entrepreneurs, solopreneurs, and business leaders from a variety of industries. He encourages his guests to share tips and ideas that can help those with an “entrepreneurial spirit” find their own path toward success.

2016 TAB PRACTICAL EXAM GUIDELINES: EXAMINERS ORIENTATION & TRAINING *

1.5 CEC Geared for current TAB Practical Exam Examiners, Chapter Coordinators, Chapter Presidents and Technical Committee Chairs (TCC), this technical training session, led by TAB Chair, Steve Clark, with special adjunct instructor, Certification Board Chair, Stanley Fleischer, will review current requirements on grading a Candidate going through the TAB Practical Exam. The basis for the training will be the newly revised 2016 TAB Practical Exam Administration Manual. Additionally, training will include a concise overview of guidelines for the Examiners which will provide consistency in the Examiner review process, ensuring a higher level of quality control for the Practical Exam portion of the TAB CP certification.

Steve Clark



Steve Clark is Vice President of Clark Balancing located in Milton, Ontario Canada. A long standing NEBB volunteer, he is the current Chairman of NEBB's TAB Committee and is a highly regarded instructor and educator in testing, adjusting, and balancing.

Stanley Fleischer



Stanley Fleischer is the owner of Seneca Balance, located in Edgewood, Maryland. A past president of NEBB, in addition to chairing numerous committees and task forces, he is currently the Chairman of NEBB's newly formed Certification Board, and is an active member of the CB's Exam Writing Committee.

ULTRASONIC FLOW METER BEST PRACTICES: A TOOL FOR COMMISSION AND BALANCING

1.5 CEC HVAC and energy professionals provide services for TAB and Commissioning, which is a very technical and applied science. It is because of these specialty skills, equipment, and application knowledge that it is not uncommon for general contractors, facilities managers, and maintenance staff to call upon NEBB professionals to monitor, survey, energy study, or commission a facilities hydronic system for service or to optimize performance. A key tool to perform these services is a non-invasive clamp-on ultrasonic flow meter. If you have the right equipment, it's just one more opportunity for NEBB contractors to keep their labor force busy and generate more revenue. Long term, this also opens the door to perform additional services within the facilities submetering system.

The goal of this presentation is to provide step-by-step best practices for popular applications, installations and solutions, and to educate balancers, commissioners, facilities managers, contractors, engineers and others on how to optimize their use of ultrasonic flow meters.

As a result of participating in this session, attendees will be able to: a) understand the basic theory behind clamp-on ultrasonic technology; b) understand hydronic survey applications, considerations and pitfalls; and c) apply best practices for clamp-on flow monitoring surveys.

Brent Baird



The Baird family is best known for their pioneering work in the Ultrasonic Flow-meter Industry. In 1977, Brent and his father Jim Baird founded Dynasonics—one of the first Ultrasonic Flow Meter manufacturers in the USA—and developed many of the core foundations for Doppler and Transit Time technologies still in use today.

Currently Brent owns Noncontact Meters Inc, a manufacturer of Ultrasonic Flow Meters and Instruments Direct, an engineering firm specializing in the development of Ultrasonic Flow Meter technology, flow studies, sales, rental and service. Although Brent is the CEO of both companies, you still will find him manning the phones as a senior application engineer, presenting webinars or touring the country as a professional technical speaker including presentations to ASHARE, BCA, CxEnergy, NEBB, AABC, TABB, NCBC, the US Department of Energy, among others.

THE IMPACT OF PENDING FAN REGULATION ON THE BUILDING ENVIRONMENT INDUSTRY

1.5 CEC The U.S. Department of Energy (DOE) has announced the intention and is well on its way to releasing regulation impacting the Commercial and Industrial Fan and Blower Market. Many products that incorporate fans will be impacted. While the DOE has regulated many products for energy efficiency, the approach taken toward regulating fans may be revolutionary and could pose unique challenges to the building environment industry.

In this session, proposed regulation (rulemaking) introduced by the DOE under the Appliance and Equipment Standards Program will be reviewed. The history of standards and regulations to date will be reviewed to understand the historical approach toward rulemaking taken by the DOE. The proposed approach toward rulemaking will then be introduced and differences in the current approach will be highlighted. With the regulatory approach toward fans presented, the impact on the building environment industry will then be discussed.

Mark Bublitz



Mark Bublitz joined The New York Blower Company in 1994 with a variety of experiences including automotive manufacturing, designing simulations of aircraft landing systems, and creating data acquisition and computer control systems. His educational accomplishments include a BSME from Valparaiso University, an MSME from Purdue Uni-

* Session attendance limited to persons designated by NEBB Chapters as examiners or examiners in training.

versity, an MBA from Indiana Wesleyan University, post graduate studies in management of engineering and technology, and various certifications and awards related to technology and participation in industry. Mark has led the Information Technology group and currently is responsible for Engineering, Order Processing, and industry interests related to energy efficiency regulation by the U.S. Department of Energy.

Stephen Wiggins



Stephen Wiggins has over 35 years of experience in optimizing building operations. His work has involved commissioning, retrocommissioning, and operations and training activities on educational, research, cultural, health care, and corporate projects. He has been responsible for more than 200 projects for over 30,000,000 square feet of facilities. Widely published and a

sought after speaker, he often teaches certification seminars for commissioning and retrocommissioning professionals. Whether a complex facility on a health care campus, in academia or private industry, or on a military base, Stephen has expertise in making buildings perform at their best.

TRANSITIONING TO ANSI-17024

1 CEC Attendees to this session will observe a practical but powerful tool to drive change/transition in their firm and organizations. This tool is a simple but easy to implement process and will help and support the current strategic goal by the NEBB Board of Directors to transition to an ANSI accredited certification process under the ANSI/ISO/IEC 17024 Standard. The six-stages circle model helps you to keep two important items from change/transition present: it is always a moving forward process and it never ends, it will always take you back to a new change/transition.

- Identify when and how to trigger a transition after a change.
- Identify the benefits of a transition and remove fear in the organization.
- Learn how to carry out a successful transition and gain in the process.
- Use the tool depicted in the presentation to help NEBB move forward to ANSI/ISO/IEC 17024.

Luis Chinchilla



Luis Chinchilla is the Director/Partner for O.P.I.A. Operaciones de Ingeniería de Avanzada de Centroamérica S.A.. He is a licensed Chemical Engineer in Costa Rica and possesses a Master Degree in Business Administration with majors in Finance and General Management. Luis is a member of the Professional Association of Chemical Engineers of Costa Rica, the Controlled

Environment Testing Association CETA, as well as the Institute of Environmental Sciences and Technology IEST. He worked

for more than 17 years in three different multinational companies, spending the last 10 ½ years before founding OPIA working for Intel Corporation at different locations around the world. He has a wide variety of disciplines under his responsibility ranging from Facilities Operations and Engineering to Infrastructure projects and Employee services.

TRACING AIR IN BUILDINGS

1.5 CEC Buildings are enclosed environments where the movement of air parcels is governed principally by pressure difference and buoyancy forces. An important element to occupant comfort in buildings is how well air is distributed and moves through a space, including how much outdoor air is entering a space, how long total air remains in the space, and how air is distributed through the space and between different spaces. This seminar describes some of the tools and methods used to characterize air movement, air exchange, and air distribution in buildings including practical measurement of pressure differential, mass balance, air velocity, and tracer methods.

Cliff Cooper



Cliff Cooper is a board certified industrial hygienist with more than 30 years' experience carrying out building surveys. He serves as a Senior Industrial Hygienist with the Air Quality Services Group at The Vertex Companies, Inc. Cliff received his B.S. degree in Biology from Marshall University and his M.S. in Environmental Science from the Washington State University.

He consults in the areas of indoor air quality and building performance. For a number of years, Cliff led building science courses through the Sustainable Building Advisor Institute, and served as faculty and field proctor for Building Performance Institute (BPI) building analyst certification programs. More recently he has led several workshops on tracing air in buildings through the American Industrial Hygiene Association. His current research involves study of tracer sensing and building ventilation performance.

TOP OPERATING COST REDUCTION STRATEGIES FOR LABORATORIES

1 CEC Today's laboratory systems are typically very complex and consume huge amounts of energy. Lowering operating costs and reducing maintenance is critical to financially sustainable research and teaching programs. This session will highlight simple, practical approaches to saving energy in the laboratory. It will focus primarily on laboratory heating, ventilation, and air conditioning (HVAC) systems. Fume hoods, biological safety cabinets, and laboratory exhaust systems will be addressed. NEBB certified test and balance and commissioning professionals will benefit from a better understanding of types of fume hoods and biosafety cabinets available, how they're used, and differing approaches to associated HVAC

systems that save energy. The latest HVAC laboratory trends in low energy laboratories will also be explored.

Kelley Cramm



Kelley Cramm is a mechanical engineer with over 30 years of experience in HVAC, plumbing and piping system design. She owned her own consulting engineering firm prior to joining Henderson Engineers in 2007. She has spent much of her career working on complex, technically challenging projects.

Ms. Cramm has been active in ASHRAE throughout her career. She is past chair of Technical Committee 9.1, Large Building Air Conditioning Systems. She is a member of Technical Committee 9.10, Laboratory Systems and Technical Committee 6.1 Hydronic & Steam Heating Equipment and Systems. She serves on the ASHRAE Technical Activities Committee and the Handbook Committee. She also serves as a reviewer for the ASHRAE Journal.

She is a member of the Engineering Division of the Missouri Board for Architects, Professional Engineers, Professional Land Surveyors, and Landscape Architects. She serves on the Kansas City, Missouri Building and Fire Code Board of Appeals. She teaches laboratory HVAC and plumbing design for Tradeline and she teaches math in the Greater Kansas City Urban League ACT Prep program.

TEN COMMANDMENTS OF CONTRACT TERMS

**1.5
CEC**

A session dedicated to educate, inform and entertain NEBB professionals regarding the potential effect of contract language on profitability. Participants will learn how to negotiate fair terms in their contract, how to spot the ten most dangerous provisions and the best ways to make changes in contracts. In addition, attendees will learn the impact of bad contract terms as well as a basis for weighing the pros and cons of signing contracts that are one-sided.

Michael Davis



Michael Davis maintains a construction law practice and represents a wide variety of trade contractors, prime contractors, manufacturers, owners/developers and design professionals. His practice focuses primarily on construction contract disputes in state and federal courts, arbitrations and mediations throughout the United States. He has successfully represented a broad spec-

trum of specialty trade contractors and prime contractors in a variety of disputes involving construction defects, labor inefficiencies, UCC warranty issues, constructive accelerations, and increased scope of work.

GETTING THE MAXIMUM OUT OF YOUR PRESSURE INDEPENDENT SYSTEMS

**1
CEC**

In this presentation, we will look into ways of optimizing hydronic systems to save energy and achieve perfect indoor climate. We will look into how differential pressure changes affect your hydronic system controls and what can be done to achieve great control and authority for your hydronic system while saving energy and operating costs. We will also be covering commissioning and partial load problems.

Bart Decker



Bart Decker is a Hydronic Training Manager for IMI Hydronic Engineering Inc. He has worked in the HVAC industry in various training, sales and business development roles with focus on valves and system optimization. In his past experience Bart has been instrumental in implementing various training programs on energy saving opportunities for engineers, contractors and end users. He is a

graduate of Western Michigan University in Kalamazoo, MI with a Bachelors in Mechanical Engineering, and an is active member of ASHREA, JEC, IDEA and National Fluid Power Society.

PROBLEM SOLVING: AIR TIGHTNESS TESTS ON LARGE BUILDINGS

**1
CEC**

Air tightness testers have trouble predicting not only how many fans they'll need for a test but what the results will be. Every tester runs into control issues where the fans don't seem to work properly together. To get rid of those problems for good, the session will focus on:

- Solving the most persistent testing problems with some new tools
- Predicting effects on accuracy of pinch points and high stack pressures in tall buildings
- Gauge, tubing and control diagnostics—performed live using Virtual Gauge
- Running a 12 fan test live with automated software

Colin Genge



Colin Genge is CEO of Retrotec, a Washington State based company that has been designing, selling and training users of blower door-fans, precision pressure gauges and analytical software since 1980. He has made major contributions to door-fan energy standards such as US Army Corps of Engineers (USACE), Canada's CGSB 149 as well as fire suppression standards such as

NFPA 2001 and ISO14520 for the containment of clean agent fire suppressants in protected rooms and buildings.

Colin has done considerable research on testing methods for high rise buildings and has consulted and tested hundreds

of the world's most exotic high value facilities, including the Space Shuttle launch pad, numerous military installations and the world's most sophisticated computer rooms. Retrotec has trained and supported thousands of testers worldwide, giving them the widest possible practical experience on how rooms and buildings fail containment guidelines.

SUCCESSION PLANNING: GETTING READY FOR YOUR EXIT

1.5 CEC Succession Planning is a vital step ensuring the future success of your company, but it is your greatest leadership challenge because of the complexity that comes with handing the baton to another leader. We will discuss how to plan the succession process, how to prequalify and select your successor, how to evaluate the worth of your business, and how to arrange your future compensation.

- Learn the critical importance of succession planning
- Learn how to evaluate the current health of your business
- Get your team on board with the process
- Select the right leader for the future
- Learn how to delegate and empower your team
- Provide key elements to evaluate the health of your business

Bill Kinnard



Bill Kinnard has 29 years' experience in Business Training, HVAC Sales, Service Management, Sales Management and Customer Service. He has a real passion for teaching contractors to better understand their businesses and help their employees become superior performers. Bill is the President of Grandy & Associates with a mission of teaching contractors how to run profitable businesses.

He is a Certified Professional Behavioral Analyst (CPBA), Certified Professional Values Analyst (CPVA) and TriMetrix Certified (CTRI) and coordinates Grandy's Team Solutions products.

BRIDGING THE GAP BETWEEN CLEANROOM TESTING AND TAB (Two-part session)

3 CEC There are specific expectations when testing a newly constructed Cleanroom for both the TAB contractor as well as the Cleanroom certifier. This presentation will attempt to bridge the gap between where the TAB contractor leaves off and where the Cleanroom certifier takes over. Understanding how the cleanroom needs to be operating when it is turned over to the client is very important to both parties. When the TAB contractor understands the priorities of the owner of the cleanroom, they can better plan their work objectives.

Discussions on what cleanroom testing takes place after TAB has been completed will be the main topic presented in an

effort to enlighten the TAB contractors and expose them to what happens when they pack-up and leave the job site.

Pat Law



Pat Law is the founder and owner of a cleanroom certification company (HEP-ATEST, Inc.) with over 25 years experience in performance testing and certifying cleanrooms. He has served with NEBB as a Board of Director, Cleanroom committee chair and currently as a committee member. He has taught numerous seminars and helped develop NEBB's Cleanroom programs and

Cleanroom standards. Patrick is very active in other industry organizations such as IEST and CETA.

NEW STANDARDS AND CRITERIA FOR HVAC SYSTEM SOUND AND VIBRATION

1.5 CEC The need for less unwanted sound in hospitals, classrooms, offices, and residences is growing in the United States. Sound and vibration from HVAC systems cause a significant part of the total unwanted sound. Consequently, the need for more awareness, knowledge, and action among professionals who design, install, and qualify HVAC systems is also growing. The technical associations that establish requirements for HVAC systems are in the process of developing new standards. It is therefore critical for a greater number of NEBB Certified Professionals to become familiar with standards and requirements for low sound.

This session will: a) present case studies highlighting the need for lower sound levels from HVAC equipment and air distribution systems; b) review the current standards governing the measurement and qualification of HVAC sound and vibration levels; and c) describe new standards under development and emerging requirements. Finally, a critique will be offered of new criteria for acceptable sound character versus the legacy methods for measuring and rating sound levels from HVAC systems.

Steven Marshall



With 35 years of experience in sound & vibration engineering, Steve Marshall currently serves as President for Scantek, Inc., an international leader in sound & vibration instrumentation and engineering. While employed at the Bristol Compressors Division of York International and the Baltimore Aircoil Company, Steve dedicated 14 years to noise control in the HVAC industry. During this time, he served on committees of the Air Conditioning, Heating, and Refrigeration Institute, the Cooling Technology Institute, and the American Society of Heating, Refrigerating and Air-Conditioning Engineers.

Steve was awarded a BSME from the University of Cincinnati, an MSME from Purdue University, and an MBA from Seattle

Pacific University. He is a Board Certified Member of the Institute of Noise Control Engineering and a Registered Professional Engineer in the State of Maryland.

Session 1. HOW EMPLOYEE ENGAGEMENT DRIVES GROWTH: RECRUITMENT AND RETENTION!

1.5 CEC According to the latest statistics, only 29% of your current workforce is actively engaged in their jobs. So what are the other 71% doing? In this fast paced executive briefing, we will discuss how to increase the number of engaged employees on your team. We will learn the key principles of employee engagement, how to spot an engaged team member and work through some tips to become an engaged leader.

Session highlights include:

- 4 quick ways to increase trust in the workplace
- 6 ways that leadership can connect with their team
- 6 things that engaged leaders do
- Discussing a tool that will help you attract and keep top talent. This time tested tool will help you retain your team longer and help them function better

Session 2. MARKETING IS NOT SALES, SALES IS NOT MARKETING: WHY YOU NEED TO KNOW THIS!

1.5 CEC Did you know that 70% of the buying process is now complete by the time a prospect is ready to engage with your sales force? How does this affect your sales team? How will your marketing message need to change to accommodate this? In this fast paced executive briefing, we will learn that while many people use the words, “sales” and “marketing” interchangeably, this is not a solid business practice.

- Learn specifically when marketing stops and sales starts. Making sure we have the right people in the right place, doing the right thing.
- Learn the four personalities and how to market and sell to each one of them. This just might change the way you market and sell.
- When? How? How Often? These are all questions we will discuss regarding communicating with your prospects and clients. The statistics will surprise you.
- Learn about how most companies fail at this vital behavior and what it costs for this failure.

Dave Molenda



Dave Molenda, CGA, CCP is the founder of Positive Polarity, LLC, a Midwest-based coaching/training firm that brings solid growth to companies from over 30 years of real world experience. He speaks regularly at conferences on topics that are designed to make the listeners not only hear, but engage. He developed a formula for success, **ST + ICE = P** (Strengthening the Team + Improving

the Customers Experience = Profit) and with this formula, he has helped companies with their business growth. He is a dynamic speaker that will truly reach the listener and move them forward!

REDUCE TIME TO BALANCE AN HVAC SYSTEM USING A PREDICTIVE BALANCING METHOD

1 CEC With the understanding of today's new trends in HVAC industry, an innovative technique has been developed to alleviate challenges faced by professional balancers. Using mass flow balance and flow momentum principles, Predictive Balancing takes the guesswork out of setting dampers by determining the optimal flow rate for each terminal and reducing the number of steps required to balance an HVAC system compared to today's proportional balancing method. Predictive Balancing drives the sequence of terminal adjustments such that a single pass of the terminals brings the system into tolerance, reducing the back and forth readings required between the terminal under adjustment and the key. Field test results have shown that Predicting Balancing reduces the time required to balance a system by 50%, and achieves tighter ROTs in comparison to today's process. Professional balancers and owners of balancing companies are strongly encouraged to attend this seminar to learn more about the advantages of using Predicting Balancing in your business.

Bob Moss



Bob Moss is the Director of Engineering for Dwyer Instruments and has been driving innovation and managing new product development teams in the area of instrumentation for 30 years. Prior to joining Dwyer, he was VP of Engineering for Danaher companies Veeder-Root and Pacific Scientific Instruments, and PolySonics, a Thermo-Fisher Scientific company. He is a member of ASHRAE Technical Committees on Air Balancing and Instruments & Measurements. He holds bachelor degrees in Mathematics, Electrical and Mechanical Engineering and is inventor on more than 20 patents, most related to the instrumentation field.

Alejandro Guada



Alejandro Guada is a Research Engineer for Dwyer Instruments and is interested in the application of multi-physics modeling approach, and numerical and experimental analysis for product development and scientific research. He has been extensively involved in aerodynamics and turbulence research using computational fluid dynamics performing aero/thermal vehicle design at Chrysler Group LLC, and micro-aerial vehicle unsteady active flow control design at the Fluid Dynamic Research Center. Alejandro holds a Master in Science in Aerospace and Me-

chanical Engineering in fluid dynamics concentration, and a bachelor in Mechanical Engineering.

CORRECT APPLICATION AND COMMISSIONING OF CHILLED BEAM SYSTEMS

1 CEC Cautious interest in chilled beams has been circling the North American market for almost a decade. Even with that interest there has been dependency on manufacturers to identify the right steps to chilled beam system design. An issue is that most chilled beam suppliers only provide the end device and therefore rely on the engineer to design the system around the chilled beam. With this, the conservative design approach has caused heightened first cost and a lack of energy savings. The liberal design approach has created problematic results in operation. Both have created confusion in the TAB industry and commissioning group. This presentation will go over both the air side and water side approaches to a chilled beam system including geographic implications (project location will have impact from the areas' climate). Further, a simple explanation of dos and don'ts with regard to how to balance the system and result in the most energy efficient solution for the building owner.

Thomas Rice



Thomas Rice is director of sales at SEMCO LLC, a FläktWoods Company specializing in energy recovery equipment, chilled beams, spiral metal ductwork and acoustical products. He has experience spanning 15 years in HVAC/R and has consulted or participated in the specification and installation in dozens of high profile hospital HVAC system projects. Rice regularly assists engineers and contractors with load calculations, enthalpy wheel performance charts, jobsite reviews, owner presentations and other key services involving energy recovery ventilators (ERV), dedicated outdoor air systems, chilled beams and other SEMCO HVAC systems. He is an ASHRAE member, sitting on 4 TCs and a part of AHRI where he chairs the Systems committee for chilled beams.

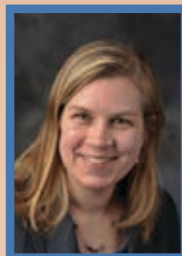
HOW TO EXPAND BUSINESS THROUGH BETTER COMMUNICATION

1.5 CEC This main focus of this panel discussion is to offer NEBB professionals the opportunity to enhance their company's marketing practices.

As a business owner, how do you market yourself better to obtain more projects, employees, and clients? This discussion will first look at the results of *Consulting-Specifying Engineer* research that outlines the various ways trade professionals, engineers, and other building professionals digest information. From this base, the panelists will review the best communication methods for engineers, contractors, trade

professionals, and business owners. From the panelists, the audience will learn about various marketing techniques, including social media, technical/trade publications, and professional association membership. The discussion will then open to the audience, and attendees will have the opportunity to share success stories in a group discussion.

Amara Rozgus



Amara Rozgus is Editor-in-Chief and Content Manager of Consulting-Specifying Engineer and its complimentary publications, including Pure Power and www.csemag.com. She has been the Editor-in-Chief since 2010, and has 20 years of experience in business-to-business publishing, including several engineering, research, and construction publications. She is a graduate of the University of Illinois at Urbana-Champaign, and holds two bachelors of science degrees.

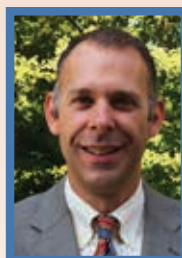
David Kirkham



David Kirkham is the founder and president of Building Systems Technologies, PLLC (BST). He has a degree in Mechanical Engineering, is NEBB certified in TAB & BSC, President-elect of his regional NEBB chapter, and has served his local ASHRAE Chapter as a member of the Board of Governors for the last three years.

As a member of the NEBB Marketing committee, David brings 18 years' experience in the industry combined with an extensive background of business development. His entrepreneurial roots combined with dedication, vision, and knowledge of the industry, has resulted in BST's sustainable growth.

Olaf Zwickau



Olaf Zwickau is President of Air Solutions & Balancing, LLC, New England's largest TAB firm. He graduated from Bradley University with a B.S. degree in manufacturing engineering and has more than 20 years of experience in the TAB industry, as well as in HVAC commissioning and demand ventilation for commercial kitchen applications. Over the years, Olaf has earned his Certified Energy Manager (CEM) credential, as well as being NEBB certified in HVAC systems commissioning. He is a member of the NEBB marketing board, as well as Vice President to his local NEBB chapter in the Northeast.

BUILDING ENCLOSURE QUALITY ASSURANCE: PAST, PRESENT AND FUTURE

1.5 CEC This course will explore common failures in enclosure performance to outline what Quality Assurance (QA)

processes must focus on to be effective. A review of basic building sciences and past-to-present review of key enclosure related codes and standards will follow. Each task, from design through operations & maintenance phases, of a comprehensive enclosure QA process will be demonstrated. We will look into the future of facades to try to predict the challenges of tomorrow. Through case studies we will outline the keys to success in tomorrow's enclosure QA practices.

John Runkle



John Runkle is the Vice President of Building Sciences for Intertek - Architectural Testing, Inc. He manages offices throughout North America and staff in the Middle East and China. John has worked on new construction and retrofit projects in most of the 50 states and numerous countries.

He serves as the Building Commissioning Association's liaison to ASTM. He also co-chairs ASTM's building enclosure commissioning personnel certification committee.

John brings over 15 years of experience as a building enclosure consultant and has been integral in the development of the practice area of building enclosure commissioning both domestically and internationally.

COMMISSIONING FOR SUCCESS

**1.5
CEC**

Energy is being wasted, possibly unrecognizable, and Indoor Air Quality (IAQ) is suffering on a daily basis when commissioning is not performed. This session examines real commissioning and continuous commissioning projects including commercial, educational, multifamily and hospital facilities. The logical argument for commissioning and its importance will be highlighted through the projects by discussing prevention of catastrophic building systems failure, actual energy savings, overcome operations and maintenance issues, improved IAQ, and increased occupant comfort. Commissioning is a living and adapting process that needs to be implemented, and could be at any point throughout the lifespan of a building; and then re-commissioned every two to four years.

Wesley Stanhope



Wes Stanhope is a Senior Project Manager at CLEAResult. Currently, Wes is focused on delivering CLEAResult's sustainability, energy and commissioning services for all building types. His previous experience includes energy auditing of approximately 23 million square feet of hospitals and offices, retro-commissioning of approximately 11 million square feet at hospitals, and

third party commissioning of hospital renovation projects. Wes is also an Adjunct Faculty Member at Mount Wachusett Community College, delivering eight courses in Energy and Sustainability. He holds a MDS degree from Boston Archi-

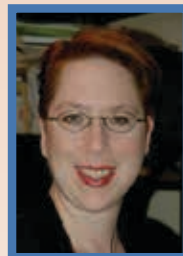
tectural College in Sustainable Design as well as bachelor of science degrees from Limerick Institute of Technology in Construction Management.

CODE ABC'S: AIR, BALANCING AND COMMISSIONING

**1.5
CEC**

There are more than six commercial energy codes in play across the US in 2015. Each of them contain three or more compliance paths, often with differing test and balance and commissioning requirements. With \$100B in 2015 construction, that's a lot of non-LEED opportunity for NEBB's 1000 certified professionals, but no one wants to be the reason for a red tag or delay either. Energy Code Circuit Rider Arlene Stewart will start with an overview of the test and balance code provisions across the country with a focus how they can be met by NEBB standards and certifications. Building Commissioning requirements for both ASHRAE 90.1 and the International Energy Conservation Code will be presented. The speakers will then discuss their experiences with TAB implementation so participants can hone their processes to make inspections and testing smoother and less bumpy for construction managers and building departments alike. Certified Building Official Doug Harvey will provide insights into building department processes, how professionals fit into the inspection process to reduce delays and provide insights into how to communicate with officials about skill set that NEBB professionals bring.

Arlene Stewart



Arlene Zavocki Stewart is the principal for AZS Consulting, Inc., a firm established in 2000 specializing in energy efficient and sustainable building compliance, advocacy, certification, training and promotion. AZS Consulting works with non-profits and government agencies to identify and fix barriers to market transformation and code implementation as well as private industry seeking

to understand, excel in and develop product for the energy efficiency and green building sectors.

Stewart's career accomplishments include advising the Florida Energy Office on the duct testing provisions for the ENERGY STAR HVAC Rebate program, developing the certification program for Florida Water StarSM, and introducing commercial lighting densities to the Florida Building Code (FBC), estimated to save over 150 million kW per year.

Douglas Harvey



As the Assistant Building Official at the City of West Palm Beach, Douglas Harvey has many opportunities to work with owners, designers, installers and staff on a variety of projects. Having been involved in bringing the IgCC to Florida and presenting the advantages of Green and LEED over the years, he is very aware of bringing a project to life and then dialing

it in. Being a LEED AP helps in understanding the intent of the systems and purposes they serve in the built environment. With over 40 years of experience in the construction industry and having worked on simple to complex EMS applications, including design, commissioning is accepted as one of the most important steps. Helping to understand the process and working together is as important as the initial design. Commissioning makes it all work. We need to speak the same language and have common goals. Training the players to accomplish that is his latest mission.

TOWARDS A NEW CODE OF CONDUCT AND BUSINESS ETHICS

1.5 CEC NEBB certified firms and professionals are supposed to not only carry out their work competently and skillfully, but also be aware of the broader ethical and social implications of their service.

In today's business environment, there is a need for a comprehensive Code of Conduct and Business Ethics compliance Standards. In the absence of such Code, certified professionals are facing serious challenges in various areas such as corruption, gifts, performing works in foreign countries and need to comply with national laws, workplace environment, conflicts of interest, unfair competition, privacy and data protection, and obligations, etc.

A proposed Code of Business Ethics will be presented aiming at enabling the certified professionals, to recognize the ethical issues and train their technicians and staff on the social and moral expectations and ensuring compliance across their firms. Ethical cases will be presented with the aim of improving the moral judgments of the attendants.

Samir Traboulsi



Samir Traboulsi is a Mechanical Engineer, holder of a PhD. in Mechanical Engineering, and a Masters in Business Administration and completed post graduate studies on system dynamics. He is the Chairman and General Manager of Thermotrade SAL, a leading mechanical trading company and the Managing Director of RANEC, a TAB firm.

Samir is a senior lecturer at the Faculty of Engineering and Architecture of the American University of Beirut, at Notre Dame University and at the Professional Training Center of the Order of Engineers and Architects in Beirut and Tripoli, Lebanon, and has been teaching Engineering Economy, Operations Research, Engineering Ethics, TAB, and HVAC courses.

He is an ASHRAE Fellow, CIBSE Fellow and NEBB Certified Professional.

He served as a Consultant for the Lebanese Ministry of Environment, Lebanon and as a Regional Consultant for the United Nations Environmental Program.



About Albuquerque: Enjoy!

Welcome to New Mexico, the Land of Enchantment

The true Southwest awaits you in Albuquerque, New Mexico. Come immerse yourself in its rich culture and heritage, rooted in centuries of history. Soak in the blue skies and sun that shines 310 days a year—perfect for outdoor activities. Breathe in the high desert air scented with sage and piñon, and you'll understand why Albuquerque is a destination like no other.

As one of the oldest cities in the U.S., Albuquerque boasts a unique multicultural heritage and history where Native American, Hispanic, Latino, Anglo and other cultural influences are a part of everyday life. You'll get the feeling you're someplace special when you're eating at one of its traditional New Mexican restaurants, shopping at one of its more than 3,000 shops and galleries, enjoying the world-class visual and performing arts or playing on the best golf courses in the Southwest. Nowhere is the confluence of past and present more dramatic than in Albuquerque, where the modern city skyline is set against a backdrop of the ancient Sandia Mountains and an endless blue sky.





Albuquerque's eleven distinctive neighborhoods reflect the great diversity of the city, from the 300-year-old Old Town Plaza to the gleaming new buildings of the buzzing Downtown area, the quiet beauty of the North Valley to the hip vibe found within Historic Nob Hill and the Spanish style architecture of the Bareas. Each of these areas has a unique personality and a variety of things to do and delicacies to eat. As you move around the city from one neighborhood to the next, you'll be amazed by the changes in scenery and the contrasts between the historic and modern architecture.

While visiting Albuquerque at night, you'll notice the city is bathed in the glow of neon signs, relics of Albuquerque's place on historic Route 66. Locals and visitors can kick up their heels in the bustling downtown entertainment district, go out for a performance by one of the international theater and dance companies that come through town or visit one of the many casinos surrounding the metropolitan area.

Whether you want to shop for authentic Native American jewelry, try hot air ballooning, explore living history museums, enjoy Albuquerque events and festivals, sample local cuisines or hit the golf courses and spas, Albuquerque has you covered.

Ready to Fly?

Rainbow Ryders, Inc. continues as the premier and largest hot air balloon business serving the Southwest for over 34 years offering scenic hot air balloon rides daily with transportation from downtown Albuquerque. Rainbow Ryders is fully licensed and insured. Their hot air balloon pilots have flown over 35,000 hours carrying more than 250,000 Rainbow Ryders passengers. Rainbow Ryders' balloon pilots are FAA certified and have over 180 years combined experience. Hot Air Balloon rides are an Albuquerque specialty! Knock this one off your bucket list – now is your chance. Book online at www.RainbowRyders.com or call 800-725-2477. Reservations are required.

Back Road Wrangler, Nick LaRue

Explore the essence of New Mexico with a back road tour in the knowledgeable hands of Mr. Nick LaRue. Nick shares his vast knowledge of the diverse culture and landscape of the southwest with all who enter into his touring jeep. A story teller and former teacher, Nick promises a tour that delivers a New Mexico you may not have known existed. Learn more on his website: www.backroadwrangler.com or check out trip advisor reviews from other travelers.

Shopping More Your Style?

Skip Maisel's Indian Jewelry and Crafts (Wholesale/Retail)

Skip Maisel's, built in the 1930's on Historic Route 66 with its show windows and Indian murals is one of the most interesting and unusual buildings in the Southwest. Today you can see the Indians coming in with their handmade goods which Maisel buys daily. He also employs several of the best Indian craftsmen whom you can watch work. You can shop for Turquoise Jewelry, Pueblo Pottery, Navajo Rugs, Hopi Kachinas and Navajo Sand paintings. All at Wholesale prices. Just a few blocks from the NEBB Meeting Hotel, Skip's is a stop you just can't SKIP!

<http://skipmaisels.com/index.php>

The Albuquerque Convention and Visitors Bureau along with Trip Advisor have an extensive listing of ideas to plan your time outside of the busy NEBB activities.

Some helpful weblinks:

Albuquerque BioPark:

- Zoo:
<https://www.cabq.gov/culturalservices/biopark/zoo>
- Botanical Garden:
<http://www.cabq.gov/culturalservices/biopark/garden>
- Aquarium:
<http://www.cabq.gov/culturalservices/biopark/aquarium>
- Official Visitors Page:
<http://www.visitalbuquerque.org/things-to-do/>
- Explore other travelers recommendations:
<http://tinyurl.com/ThingsToDoinABQ>



The Hotel

Hyatt Regency Albuquerque

330 Tijeras Ave NW
Albuquerque, New Mexico 87102, USA
Tel: 1-402-592-6464 1-888-421-1442
Website: www.albuquerque.hyatt.com

This centrally located hotel will prove the perfect launching point for conference attendees with its spacious and modern meeting amenities. Adventure and entertainment are close by with easy access to Albuquerque's historic downtown with galleries, shopping and numerous restaurants.

NEBB has secured a discounted standard single/double room rate for the conference of \$179 plus applicable taxes. Please be sure to ask for the NEBB room block when reserving.

To secure a room, please use the reservation link <http://tinyurl.com/NEBB2016Hotel> or call the hotel at 1-888-421-1442. **To ensure the discounted room rate, reservations must be made before March 1.** Group rooms may sell out, so don't delay. Rooms are subject to availability.

** All reservations made after March 1, 2016 will be on a space-available-and-prevailing-rates basis.*

*** Children under 18 stay free with adults and are not counted in occupancy.*



Fee Breakdown & Other Information

Conference Registration Fees: Register at nebb.cvent.com

Register Early & Save!	Before February 29,2016	After February 29,2016
Conference Registration	\$850	\$1,000
Guest Registration	\$150 (under 18 is \$50)	\$250 (under 18 is \$150)

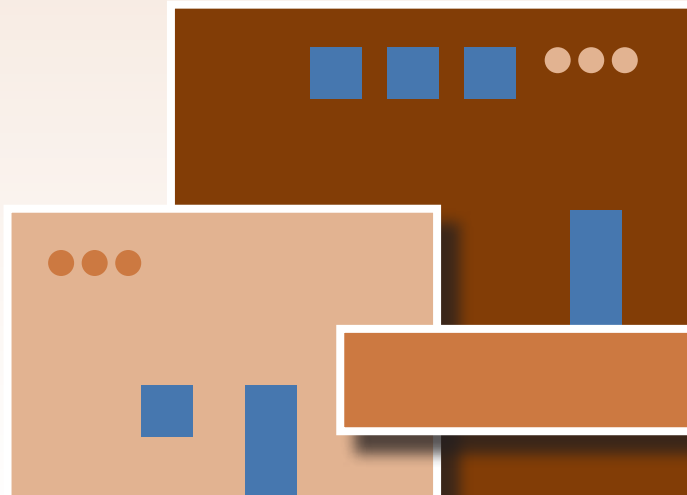
Included Items

The **full Conference Registration Fee** includes admission to the following:

- Opening Session and Get Acquainted Reception on April 14
- Technical Sessions on April 15-16
- Breakfast, Lunch, Morning and Afternoon breaks on April 15-16
- Vendor Reception on April 15

The **Guest Registration Fee** includes admission to the following:

- Guest Breakfast Session and City Transport on April 14
- Opening Session and Get Acquainted Reception on April 14
- Continental Breakfasts on April 14-15
- Closing Session on April 15



Optional Items

Golf Tournament and Optional Tours require separate registration.

Activity	Date/Time	Cost
19th Annual Golf Tournament	April 13, 8:00 a.m. - 2:00 p.m.	\$120
Golf Club Rental	April 13, Pick up at Golf Club	\$40
Tour - Santa Fe	April 12, 9:00 a.m. - 5:00 p.m.	\$68
Tour - Acoma Pueblo & Winery	April 15, 8:00 a.m. - 4:00 p.m.	\$125
NEBB Logo Polo Shirt	Pick up at conference registration	\$35
BET Seminar	April 11-12, 2016	\$800 - \$1000
BET CP Exam	April 13, 2016	Contact certification@nebb.org for pricing
Optional NEBB Exam Day	April 17, 2016	Contact certification@nebb.org for pricing

Registration Changes

All conference registration changes should be emailed to cheryl@nebb.org.

Please contact the hotel and airline directly for travel updates.

All fees are in U.S. dollars.

Cancellation Policy

Written Request Received by February 29, 2016	Full cancellation less a 25% admin fee
Written Request Received on/after March 1, 2016	Nonrefundable
No-show for any reason	Nonrefundable

Payment Information

Online registration is payable by credit cards (American Express, Mastercard, Visa and Discover) or check. If you select to pay by check, please make your check payable to NEBB, and mail the check along with the 2016 NEBB Annual Conference - Offline Registration Form (see next page).

Note: Offline Registrations must be received and confirmed by NEBB Headquarters by April 5, 2016.

NEBB (Attention Meeting Registrar)

8575 Grovemont Circle, Gaithersburg, MD 20877

Note: NEBB's taxpayer ID # is 23-7180848

Exams in Albuquerque!

This year, NEBB will again offer pre-approved candidates the opportunity to sit for various written exams and written practical exams on Sunday, April 17, 2016. **Separate Registration is required.** Please note that the exam testing application and pre-requisite requirements must be submitted via email to certification@nebb.org on or before **March 15, 2016** in order to receive approval to sit for the exams, both written and the written practical. For more information, please feel free to email certification@nebb.org.

Continuing Education Credits



NEBB Certified Professionals who register for the meeting and attend technical and educational sessions will receive credit for meeting their 2016 NEBB Continuing Education requirement. **Continuing Education Credit (CEC) is listed by each presentation (60 min = 1 CEC, 90 min = 1.5 CEC).** Submission of completed vendor raffle drawing coupon provides one CEC. NEBB Certified Professionals must sign all rosters to verify attendance and receive CECs. Please contact NEBB's Certification Department certification@nebb.org with any questions on credits/continuing education processes.



NEBB: Rich History • Bright Future

Offline Reservation Form

2016 NEBB Annual Conference

April 14-16, 2016, Albuquerque, NM

To explore options details/register online, visit nebb.cvent.com

1. Send this form to NEBB by **February 29, 2016** to receive Early Bird Rate.
2. A separate registration form is needed for each full registrant attending this meeting.
3. Form with payment must be received & confirmed by NEBB Headquarters before 4/5/2016.
4. Please register onsite after that date.

☐ New/changed address?

☐ First Time Attendee?

Full Name _____

Name on Badge (if different then above) _____

Company _____

Address _____

City _____ State _____ Zip _____ Country _____

Telephone _____ Chapter _____

E-mail _____ ADA or Special Dietary Needs? _____

Options/Fee Listing	Quantity	Amount
Full Registration (Thursday-Saturday) \$850 (after 2/29/2016 price - \$1000)	One per sheet	
Additional Options:		
Guest Registration (regular) \$150 (after 2/29/2016 price - \$250)		
Guest Registration (minor, under 18 years) \$50 (after 2/29/2016 price - \$150)		
Preconference Tour: Santa Fe, Tuesday 4/12/016, \$68		
Guest Tour: Acoma Pueblo/Winery, Friday, 4/15/2016 \$125		
NEBB Polo Shirt, Please indicate size: <input type="checkbox"/> SM <input type="checkbox"/> MED <input type="checkbox"/> LG <input type="checkbox"/> X-LG <input type="checkbox"/> XX-LG \$35		

Annual Conference 2016 Refund Policy: A credit, less a 25% processing fee, can be issued for all written cancellation requests received prior to February 29, 2016. No requests will be approved after this date.

Payment Method: PAYMENT MUST BE RECEIVED before reservation is confirmed. Total Due \$ _____

☐ CREDIT CARD # _____ Exp _____

Signature: _____ Date _____

☐ CHECK: Payable to "NEBB". Registration is not confirmed until payment is received by NEBB



HOTEL REMINDER

Hotel reservations MUST be made by March 1, 2016 to ensure NEBB Rate and Availability. Rooms from \$179 per night.
Reserve online at <http://tinyurl.com/NEBB2016Hotel> or
CALL 888 421 1442 (ask for group rate)
Room quantities are limited; act fast!

Notes:

- Please fill out this form, include payment method and send to NEBB, 8575 Grovemont Circle, Gaithersburg, MD 20877.
- Telephone: (301) 591-0488 - Fax: (301) 591-9877 - mailto: cheryl@nebb.org.
- Form must be returned to NEBB by 2/29/2016 to qualify for the early-bird rate. **Not accepted after 4/5/2016.**
- Offline Registration is available for the 19th Annual Golf Tournament, Sponsorship/Exhibits and Daily Registrations.
- Contact cheryl@nebb.org to get the forms or access at site referenced below.
- For additional meeting details, updated schedules, agendas, and other materials as they become available visit nebb.cvent.com.

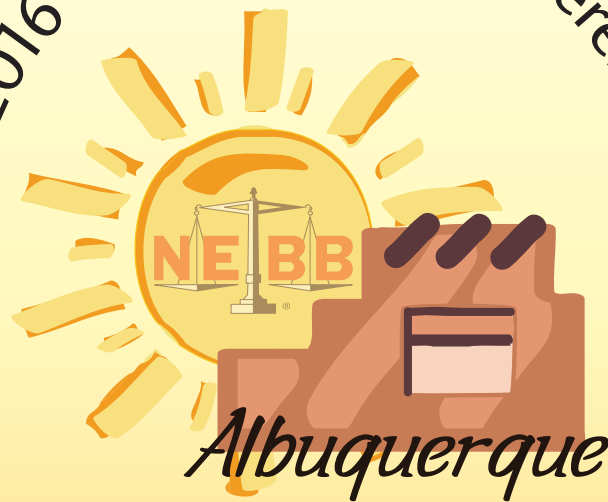
To update mailing address and to continue to receive
The NEBB Professional, please send an email to
cheryl@nebb.org.

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**REGISTER
NOW at**
nebb.cvent.com

2016 NEBB Annual Conference



New Mexico

Rich History • Bright Future

April 14-16, 2016

Hyatt Regency Downtown

You

can't

miss

it!