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- The "When-What-Who-and-Why" of CO and Combustion Testing
- Properly Managed Service-Generated Leads Increase Sales Success
- Finding Future Technicians: Get Involved with Your Local Trade Schools

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APRIL 2023 VOLUME 7 NUMBER 4

HIGH-PERFORMANCE HVAC TODAY™

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DEPARTMENTS

By Mike Weil

Nine to Tips to Help Protect and Keep *Your Technicians Safe this Summer*

Mike Weil is editor-in-chief and director of communications and publications at National Comfort Institute, Inc. Contact him at ncilink.com/ContactMe.

This has been a very bizarre winter. We've seen rain and snow, tornadoes and blizzards, landslides, mudslides, and snowmaggadon.

But now it's April and we'll soon start seeing warmer temperatures, lots of sunlight, longer days, and hopefully, tons of air conditioning calls!

But all those niceties can quickly become not-so-nice when you are working on hot rooftops, stuffy crawlspaces, and in unbearable attics.

The U.S. Occupational Safety and Health Administration (OSHA) offers its **Heat Illness Prevention** program to help guide contractors how to protect their field service and installation crews while working in the heat. Here are nine things OSHA points out:

1. Eat Right: This is just common sense. Your team shouldn't skip meals or overeat. In hotter weather, its always better to eat light (skip greasy, heavy foods). According to OSHA, its also an excellent idea to drink at least eight ounces of cool water per hour.

2. Caffeine is not Your Friend: We all love our coffee in the mornings, but drinking too much on a hot day can cause dehydration. Also, energy drinks and some sodas are full of caffeine. So it's a good idea to reduce your intake of these beverages on hot days.

3. Dress Properly: Are your uniforms short-sleeved and lightweight? Are they made from moisture-wicking material? They should be. And be sure to encourage your team to use sunscreen and wear sunglasses when working outdoors.

4. Get Lots of Sleep: OSHA also recommends people get plenty of **REM** sleep. This is easier said than done during hot weather, but is vital for keeping your people healthy and better able to handle hot indoor and outdoor temperatures.

5. Stay Healthy: The better physical shape you're team is in, the better equipped they will be to deal with extreme temperature stress. Extra body fat and underlying health problems will contribute to quickly becoming overheated.

6. Self-Check: Every person reacts differently to temperature extremes, so it's important for techs to pay attention to how they feel. If they become light-headed or dizzy, they should tell someone and find a cool place to rest. Again, drink plenty of water. Also, if possible, try to schedule working hours for your field team close to the coolest part of the day — mornings or evenings.

7. Recognize Heat Exhaustion: When you conduct safety training for your team, its a good idea to talk about heat exhaustion. Discuss what it is and its signs. OSHA says heat exhaustion signs include fatigue, disorientation, nausea, headache, a rapid heart rate, and clammy skin. These symptoms can quickly escalate to heat stroke if not attended to.

8. Recognize Heat Stroke: This is serious. When experiencing heat stroke, a person will have an elevated body temperature, loss of consciousness, convulsions, vomiting, and diarrhea. Learn to recognize the signs in yourself and others. Most victims of heat exhaustion and heat stroke won't recognize it in themselves, so co-workers should watch out for each other. Pay special attention to those over 65 years old, those who are overweight, and those on medications.

9. Take Plenty of Breaks. Frequent breaks can help with overheating, which is important in avoiding heat exhaustion or heat stroke. Breaks mean getting out of the sun, drinking water, and cooling down.

Your techs are the lifeblood of your business. By taking care of them, they can take care of your customers and your business. So consider these tips and have a profitable and safe summer. NCI

Written by HVAC Professionals for HVAC Professionals

SAUERMANN NCI SI-CA030 COMBUSTION ANALYZER

Introducing a new advanced combustion analyzer by the **Sauermann Group** called the NCI Si-CA030. This analyzer is part of a special kit for NCI members and students. It includes the normal combustion probe, a separate draft probe, and comes in a large soft case.

The CA030 measures oxygen (O_2), carbon monoxide (CO), and flue temperature much like other analyzers, but the instrument's ability to detect higher CO readings (8000 ppm) allow more time to evaluate certain problems that would otherwise be over-ranged. The life of the O_2 and CO sensors is listed as four to five years, which is longer than most.

One of the great features of the CA030 is its wireless communication with your iPhone or iPad. This ability is beneficial when gas-fired equipment is in a small closet and must be tested with the door closed while you stand outside. On larger commercial equipment, the flue distance to the burner is farther than the hose assembly for the CA030, which would not allow us to read the measurements as they happen.

Another great feature is this instrument makes the NCI flue interference test less tedious because you can see the draft reading from different locations in the building as you turn on additional exhausting appliances or open and close doors.

Did I mention the large soft carrying case? There is room for the analyzer and plenty of room for other meters and tools to make them easier to carry.

Sauermann has many videos and instructions on the Internet about using the CA030 analyzer and all its options. They are some of the best I have seen. This is a new analyzer, so its field history is short as of now, but the feedback so far from the field is that technicians like it.

For more information, go to **ncilink.com/Sauermann**.

— Jim Davis, senior instructor, National Comfort Institute NCI

By Mike Weil

Recruiting Techs Requires Active *Participation in Trade Schools*

For many decades the HVAC Industry has suffered from a low inflow of new people into its ranks. That problem has become even more acute due to the increase in contractor and technician retirements as the **HVAC workforce ages**. So many articles have been written on this subject, with so many calls for a renewed industry-wide focus on the problem. Yet the issue persists.

Many contractors turn to their local trade schools and career centers to recruit students for their HVAC businesses. Over the years, many have complained that the best students graduating from these schools are often hired outside the industry's contracting segment by manufacturers, facilities management firms, hospitals, distributors, and so on.

The "leftovers," I've heard contractors say, often aren't well equipped to do the contractors any good, especially if hired for the busy summer season.

And yet, from the trade schools' perspective, there is a different story. One school in particular, The **Polaris Career Center** in Middleburg Heights, OH, is an example of a first-rate technical school with a robust **HVACR program**.

Their modus operandi is to maintain strong relationships within the HVACR industry throughout Northeastern Ohio.

According to Rick Reitz, Polaris' HVACR program instructor, the secret sauce is having contractors working with the school in a proactive manner rather than waiting for graduating students to approach them.

SOME BACKGROUND

According to Reitz, Polaris opened its doors in 1975. From inception, the school had an HVAC program that works with six local high school districts and adult learners from across Northeastern Ohio. In 2019 Polaris completed a nearly $60 million renovation of its facility, which occupies 257,000 sq. ft. of space on 47 acres of land. These renovations included complete updates to the HVACR labs and classrooms with new equipment and technology.

But the focus is on how to get young people interested in careers in the trades.

"Beginning in the eighth grade, students are invited to tour our facility to get familiar with our career-technical programs," says Doug Miller, the school's director of community outreach.

"They also begin to explore the ***idea*** of Polaris, and then, as they get into ninth and tenth grade, they see what we have to offer. They often discover that many of our programs provide access to college credit and industry credentials. This opens their eyes. Their parents love what they see too, and they love what we offer."

Bill Evans, the Polaris principal, says that currently, the career center has 950 students in the building, but the Polaris satellite program impacts around 4,000 students. He adds that in a typical year, more than 70% of these students go straight from Polaris to some form of additional education at a two or four-year institution.


Rick Reitz

In the HVACR program, Reitz says they enroll around 25 in-coming juniors and have a wait-list of additional applicants each year. He also says that around one-third of them eventually go to work for contractors.

"It roughly breaks down like this," Reitz explains. "One-third of them graduate and go to work for HVACR contractors. Another third complete the HVACR program and go on to pursue further education. The final third move on to other endeavors, including some who start their own businesses."

Evans adds, "As far as contractors go, the best advice I can give is get involved with an HVACR program — get to know the teacher, join an advisory council, be a guest speaker, offer field trips to your facility, participate in mock interviews, offer shadowing experiences, be visible at student/parent open house events and more. Be as active as your schedule allows. Remember, it's a long-term investment of your time and talents."


Doug Miller (left) and Bill Evans

OUTREACH PROGRAMS

Rick Reitz agrees and says the key for contractors is to get involved in the school's outreach programs.

"Get involved and you'll make connections with our students and staff. The investment in your time will pay off," he explains.

Reitz spent much of his working life in the HVAC trades – first as an installer and service technician for an HVACR contractor in Texas, then as a commercial factory service tech for the Trane Co. in Atlanta, GA.

"At Polaris, we work with many great HVACR contractors through our advisory council," Reitz continues. "We have at least two meetings with them per year as required by state and federal mandates. We understand that many folks have demanding schedules, so we have shifted our meetings to a virtual format that allows for much more participation."

"Those who get involved are seeing the pay off. Our active industry partners often help in our mock interviews, and they get connected to our students earlier in the employment process. Plus, if we need something, they're here for us."

Reitz was born in Cleveland and ultimately returned home from Atlanta to work as a Trane factory service technician for Gardner Service. Eventually, he joined the staff at Polaris as an instructor and has been there for 15 years.

He knows the importance of working with young people from his background and explains how several participating contractors helped outfit their classrooms and labs.

For example, the students can access $30,000 of **Bitzer compressors**, all donated by **Fazio Mechanical**, a participant on their advisory board.

"In fact," Reitz continues, "Fazio people are coming in to do a compressor tear-down class for our students."

The advisory board not only has input into the HVACR program curriculum, but Reitz says they have early access to provide students with job opportunities.

"Hiring high school students has its challenges. It's important for us to help manage employer expectations. Many of our partners would prefer to get more hours from our students each day but that is constrained by the school schedule. Employers that adapt and open their doors to our students usually scoop up the best ones after graduation," says Reitz. "Sometimes you have to make an investment to get better students," he adds.


Polaris Senior Hunter Huff

TOP STUDENTS MAKE A MARK

Reitz says that Polaris gives junior and senior students with solid grades and good attendance records opportunities for internships. He says that if those students have a good experience, they become even more engaged and make their mark on the

Polaris Rooftop Equipment Lab

Polaris HVACR program.

One example is an 18-year-old student named Hunter Huff. Hunter is a senior graduating this June who landed an internship in the facilities department of Southwest General Health Center.

This hospital is a 103-year-old community health and support center serving the greater Cleveland area. Huff's internship there includes hands-on training and experience working with commercial boilers and modern digital control systems.

"I basically carry as much responsibility as any other employee, even though I'm just an intern," Huff explains. "The work is very hands-on, and they give me a lot of responsibility for working on boilers, air handlers, pump motors, and more. They even let me work on many automation controls, which is rare for someone my age."

He adds that the facilities team gives him tasks to do, but he has the freedom to run some control diagnostics independently. He also shadows the hospital's controls contractor.

Interestingly, Huff says his original goal was to be an electrician, but he fell in love with HVACR.

"I became interested in learning about refrigerant properties and all I could about heat transfer. Polaris laid the groundwork, and now the hospital is giving me practical experience."

The good news is that Huff has impressed the people at Southwest, and they have already offered him a full-time position after he graduates. Huff says that Southwest is already furthering his training by helping him to earn his stationary license.

HVACR IS A THINKING TRADE

Rick Reitz says they often have to overcome a major obstacle with potential students. That obstacle is the idea that the trades only involve heavy physical work.

"The reality is that HVACR is a

(Recruiting continued on page 10)

Guest speaker Al D'Ambola from National Comfort Institute teaches Polaris HVAC students about proper techniques to test for static pressure.

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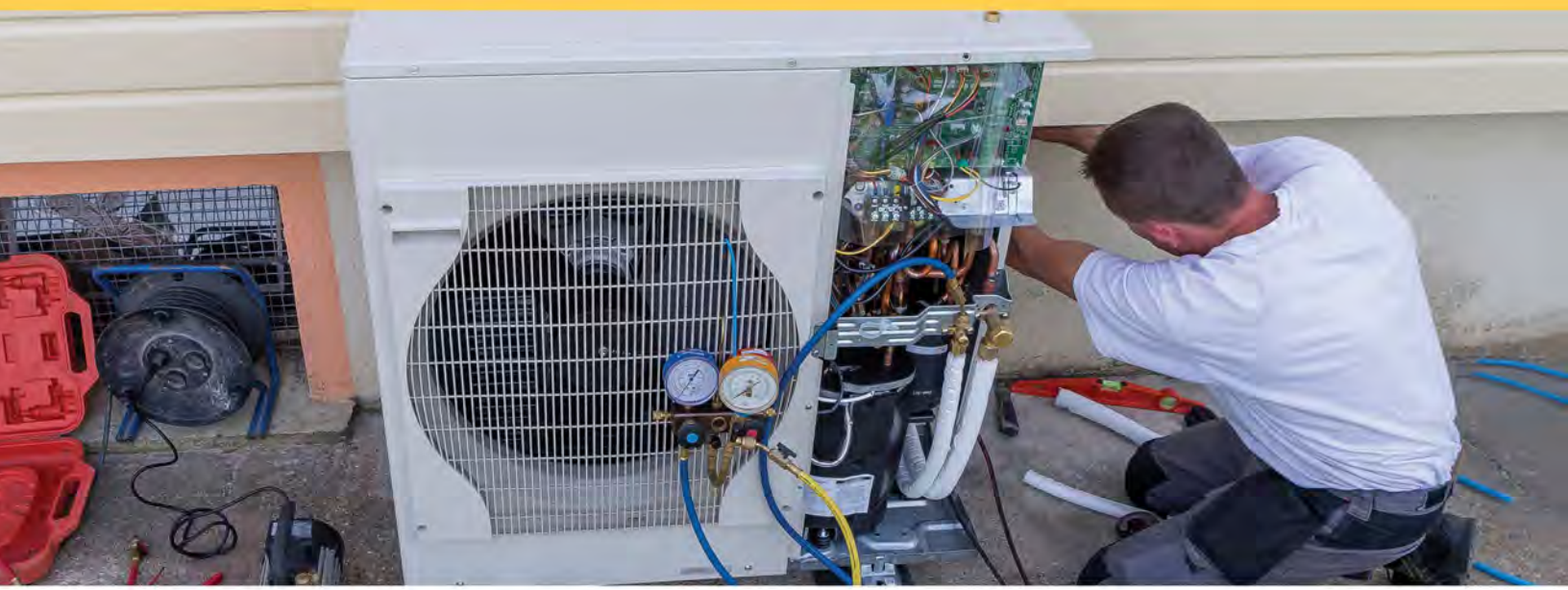

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IHACI NATE AC/HP & Air Distribution Training (Four-Part Series)
May 31, June 1, 7 & 8 | 6 p.m. to 9 p.m. PT | Irwindale, CA

NCI Commercial Air Balancing Certification Program (Three-Part Series)*
June 6, 7 & 8 | 8 a.m. to 5 p.m. PT | Anaheim, CA

IHACI (CAQI/QM/QS) AC/HP Refrigeration Module (Four-Part Series)
June 6, 7, 13 & 14 | 6 p.m. to 9 p.m. PT | Tulare, CA

Basic Heating, Ventilating, Air Conditioning & Refrigeration
June 15 | 8:30 a.m. to 12:30 p.m. PT | Irvine, CA

NCI Advanced Air & Hydronic Balancing Certification Program (Five-Part Series)*
June 19, 20, 21, 22 & 23 | 8 a.m. to 5 p.m. PT | Anaheim, CA

NCI Performance-Based Selling Bootcamp (Three-Part Series)*
June 27, 28 & 29 | 8 a.m. to 5 p.m. PT | Anaheim, CA

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(Continued from page 8)

thinking trade," he says. "If you're analytical, you can make a lot of money.

"In general, people have the wrong perception about the trades. From my perspective, if kids like math or engineering, they would probably be good at HVACR. Why? Because a lot of analytical thinking is required – whether you are designing systems, installing them, or servicing them."

He says that it's not enough to know how to turn a wrench. Contractors and technicians need to know what an HVACR system is (not just the equipment, but also the airflow systems), what it means to take readings and understand what those readings mean, and more.

He cites students like Hunter Huff as examples of that. Another example is a young man named Jonathan Paracsi, a high-school student at Polaris who graduated and began working for Total Line Refrigeration in Avon Lake, OH.

Reitz says Paracsi had six months of training at Total Line, then spent the next four years as a commercial HVACR service technician, specializing in restaurant, cold storage, and supermarket refrigeration.

Recently, he joined the HVACR team at Polaris as an instructional support specialist to assist in the lab setting.

"Today, Jonathan is advancing his education with the help of Cuyahoga Community College and plans to transfer to a larger institution to pursue a four-year degree," Reitz adds.

As an aside, Doug Miller says that the owner of Total Line Refrigeration, Chris Cornet, is also a former student of Polaris.

The Polaris Career Center occupies 257,000 sq. ft. of space on 47 acres of land in Middleburg Heights, Ohio.

"He went through our Construction Trades program and found his way into the refrigeration business. You never know where that road will take you, and that's the beauty of this environment," Miller says.

Reitz adds, "One of my beliefs is that any 'thinking trade' requires a lifelong commitment to learning. At Polaris, part of our mission is to instill that into our students. We tell them Polaris is a starting point, not an endpoint. We always encourage students to continue their education. Students like Hunter and Jonathan are great examples of that."

He points out that such successes directly result from allowing students to dig in and learn.

THE EMPLOYABILITY SKILLS UMBRELLA

Miller also says that Polaris helps students navigate the employment and job search process.

"We call this the employability skills umbrella. Resume writing is part of it, but we also help students with job search, interview techniques (we conduct mock interviews with members of each program's advisory council), and more. We will also bring in industry members to interview our students.

"We allow time at the end where the interviewer can spend a few minutes with each student to give them constructive feedback. For me, that's the best part because students can work on eye contact, proper handshakes, etc."

Miller adds that all the teachers at Polaris come from industry and bring that industry's insight, know-how, and work ethic into their program, and pass that along to the students.

"They help students understand the importance of reliability, dependability, showing up, and being a good teammate. They encourage students to be open to learning new things," he adds.

WHAT'S NEXT?

So what does the future hold for the HVACR Program at Polaris Career Center? Reitz immediately smiles and says that the future is in the hands of young men like Jonathan Paracsi.

"I'm old school, and Jonathan represents the next generation of instructors here. He is closer in age to the students, and having him working here is fantastic. He has the right attitude and respects the trade, himself, and others. For me, that is the core of everything we teach here.

"Other exciting things happening here involve making sure we have the

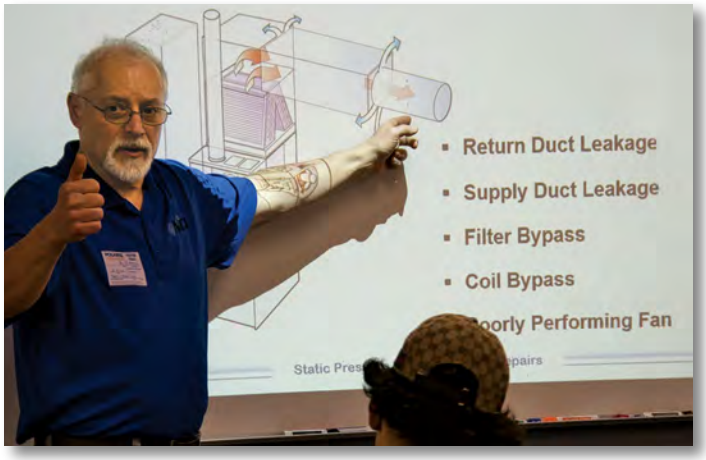
right technology and equipment to ensure our HVACR students are prepared to start their careers," he continues.

"Bill Evans successfully completed a grant to provide tools to students enrolled in Polaris heavy trades programs. This $50,000 grant from Stanley and Black and Decker provides around $400 worth of tools (including a tool bag and hand tools) to each student.

"We also have a partnership with Refrigeration Sales Corp., which allows our students to purchase required multimeter test instruments at a discount."

"All our students graduate from Polaris knowing how to use their tools and instruments," Reitz says.

The future also includes an increased interest in Polaris HVACR students from companies like local utility, Dominion Energy, fire alarm companies, and others who need people with electrical and HVACR training. In the end, Reitz, Miller, and Evans all agree that their mission is to help create productive citizens.



Students engage with Al D'Ambola from NCI as he teaches them about duct leakage and static pressure.

Reitz concludes by saying that Polaris gives students the basics and the background to be successful. They work to help students develop a love of learning and continuing education so that they can get ahead in their careers.

"We are like the freshman-level courses in college," he says. "We encourage students to develop their skills through HVACR Industry training groups, manufacturers, and distributors so they can get to the journeyman level of skills and be certified as top professionals in this trade.

And thanks to continued support from our industry partners, our program will continue to thrive and offer our students meaningful careers in a growing profession." NCI

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HIGH PERFORMANCE Starts with Service

NCI's Summit has become the gathering place for High-Performance Contractors across North America. It's the only event of its kind completely focused on servicing, selling, and delivering high-performance HVAC systems.

This conference is open to the entire industry. Summit is a welcoming gathering of like-minded people who are open and willing to share with their fellow high performance professionals.

The most successful high-performance HVAC contractors understand that testing and diagnostics by their service and maintenance teams provides huge returns, both in terms of fixing "system" issues on the spot, and generating leads for equipment replacement with add-on Air Upgrades and duct system renovations.

At Summit this year NCI's instructors and coaches will facilitate discussions on several key implementation areas to help you build a solid roadmap to take you to the next level.

BREAKOUT SESSIONS:

- Profitable System Upgrade Leads through Testing and Diagnostics on Service Calls
- Keep Customers Safe and Generate Leads with CO Safety and Combustion Testing
- Increase Sales Success by Properly Managing Service-Generated Leads
- Build Lifetime Customers with High-Performance Maintenance Agreements
- Deliver High Performance with Hands-on Diagnostics in Low-Performance Town.

BE SURE TO BRING TECHNICAL, OFFICE, AND SALES STAFF

This year all sessions all repeat! You will have the opportunity to attend each one. To get the most from these sessions we recommend you bring at least 3 people. Be sure to ask about our special 3-Pack offer!

Visit the Summit Week website at **GoToSummit.com** to reserve your seat for what will be another top notch, educational Summit experience. Seats are limited this year and going fast, so don't delay, register for Summit 2023 in Branson, MO today - and take your High-Performance HVAC business to the next level!

SPECIAL EVENTS

WELCOME RECEPTION & CELEBRATION: Meet up with old friends and make new ones at this Welcome Extravaganza. Join your fellow contractors from across North America to celebrate our industry's resilience during the tough times of the past year.

NCI PARTNERS RECEPTION AND TRADESHOW: Our partners help make this conference possible. Show your appreciation by attending the trade show events. Who knows? You might find that next great product or idea!

IDEA MEETING: All attendees are invited to this 2-part event where each participant can propose one or more ideas in the areas of lead generation and sales. Don't forget to bring your ideas and $20 entrance fee. The best ideas split the pot for great cash prizes!

NCI PARTNERS EDUCATIONAL SESSIONS: Pick from several special sessions hosted by NCI Member Rewards Partners. Topics will range from new HVAC technologies, to software, to business improvement seminars.

AWARDS BANQUET: This long-standing tradition is one of the highlights of every Summit. Join us in honoring the best of the best high-performance HVAC contractors. You may be one of them!

BREAKOUT SESSIONS

Profitable System Upgrade Leads through Testing and Diagnostics on Service Calls - *Facilitated by Al D'Ambola*

This highly interactive session focuses on generating unlimited system upgrade leads by simply performing and recording static pressure measurements on every repair and maintenance call. This session will help you gain new ideas to get your whole team focused on the importance of executing basic diagnostic procedures on every repair, maintenance, and installation opportunity. Learn from your peers as they share their insights about what they have learned, what works, and what doesn't work.

Keep Customers Safe and Generate Leads with CO Safety and Combustion Testing - *Facilitated by Jim Davis and David Richardson*

In this interactive session, you will have an opportunity to exchange thoughts on how to keep your customers safe while generating leads with carbon monoxide (CO) and combustion testing. The discussion will focus on the importance of why and what to test on every call including ambient CO testing and what to do in various situations.

Increase Sales Success by Properly Managing Service-Generated Leads - *Facilitated by David Holt*

Unfortunately, many proactive sales opportunities generated by repair and maintenance technicians that perform routine static pressure measurements are handled very poorly, if at all. Without a solid plan, these golden opportunities get stacked up in a desk drawer or simply fall through the cracks. This results in frustrated customers, unhappy service techs, unemployed comfort advisors, underemployed installers, and reduced company profits. In this session, we will discuss a simple step-by-step process for effectively managing and responding to these great sales opportunities.

Build Lifetime Customers with High Performance Maintenance Agreements - *Facilitated by Jim Ball*

Wouldn't it be nice to have an expanding group of 'raving fans' for your business? A high-performance maintenance agreement program will help your team take better care of customers, transforming them from "occasional buyers" into "lifetime partners". When you attend this workshop, Jim Ball will help you discover how to build a strong maintenance agreement program based on NCI's high performance processes.

Deliver High Performance with Hands-on Diagnostics in Low-Performance Town - *Facilitated by John Puryear, Andrew Smith and Jeff Sturgeon*

There are hidden defects plaguing the residents of low-performance town. Can you diagnose and provide solutions to their problems and bring them back to their high performance days? Learn to walk the **"PATH to Performance"** as you measure and diagnose, static pressure, airflow, temperature, and delivered Btus. Once you test and diagnose the problem(s), you'll make adjustments and assemble a scope of work to improve system performance. Don't miss this interactive session where we will introduce new test instruments to NCI's training offerings.

SUMMIT WEEK 2023

SCHEDULE OF EVENTS

MONDAY, APRIL 17

Pre-Summit Events

8:00 a.m. - 5:00 p.m.	Advanced Airflow Diagnostics with Hands-on – Recertification Class
8:00 a.m. - 5:00 p.m.	Advanced CO & Combustion Diagnostics – Recertification Class
5:15 - 5:45 p.m.	Summit Orientation Meeting – All Welcome!
6:00 - 8:00 p.m.	Welcome Reception Sponsored by *Daikin Comfort Systems* DAIKIN

TUESDAY, APRIL 18

7:00 - 9:00 a.m.	Breakfast and Interactive Opening Session
9:15 - 10:45 a.m.	Breakout Sessions 1 – Workshops
11:00 a.m. - 12:30 p.m.	Breakout Sessions 2 – Workshops
12:30 - 1:30 p.m.	Luncheon and General Session
1:30 - 3:00 p.m.	General Session – Keynote Speaker: Jan Spence
3:00 - 5:00 p.m.	Idea Exchange Meeting – Optional - *$20 cash entry fee - contractors only*
6:00 - 8:00 p.m.	NCI Partner Trade Show Reception

WEDNESDAY, APRIL 19

7:00 - 8:30 a.m .	Breakfast & General Session
8:30 - 9:00 a.m.	State of High-Performance HVAC – *with NCI President & CEO, Dominick Guarino*
9:30 – 11:00 a.m.	Breakout Sessions 3 – Workshops
11:15 a.m. to 1:15 p.m.	NCI Partners Tradeshow and Luncheon
1:30 - 3:00 p.m.	Breakout Sessions 4 – Workshops
3:15 - 4:00 p.m.	NCI Partners Educational Sessions
4:15 - 5:00 p.m.	General Session: Idea Session Winners and Partner Prize Drawing
6:00 - 7:00 p.m.	Sponsor Appreciation Cocktail Reception
7:00 - 9:00 p.m.	Awards Banquet and Presentation Ceremony

THURSDAY, APRIL 20

7:00 - 8:30 a.m.	Breakfast & General Session
8:30 – 9:30 a.m.	Special Panel Discussion: The Future of High-Performance HVAC
9:45 – 10:30 a.m.	NCI Partners Educational Sessions
10:45 a.m. – 12:15 p.m.	Breakout Sessions 5 – Workshops
12:15 – 1:30 p.m.	Closing Luncheon – *with NCI President & CEO, Dominick Guarino*

HIGH-PERFORMANCE HVAC SUMMIT 2023

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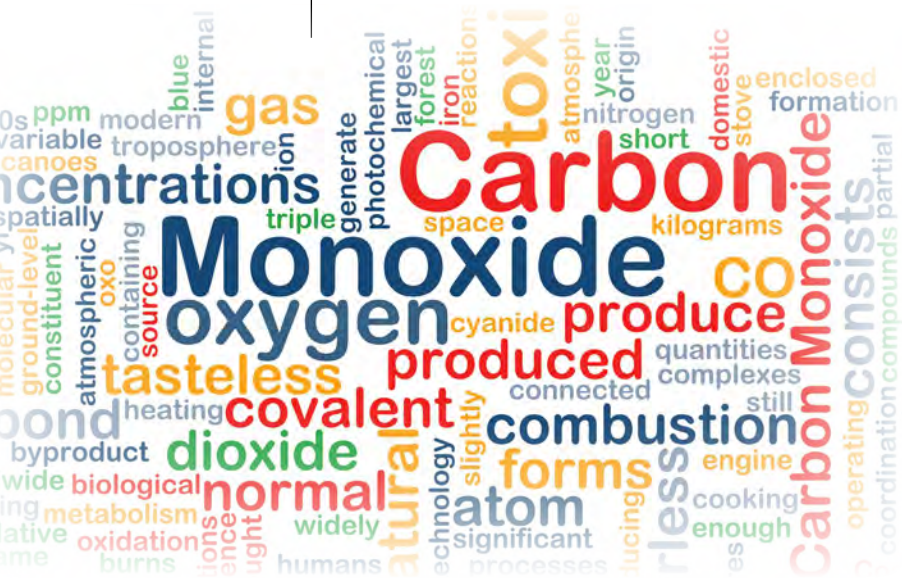
By Jim Davis

The When-What-Who-and-Why of CO and Combustion Testing

How many occupations directly impact consumer health and safety? Those who do are doctors and nurses, the police, fire safety forces, and the military. Usually, these groups respond to a known danger, health, or safety issue.

But when HVAC contractors enter a building, we enter a world of unknowns. If we are not dedicating our efforts to the safety of the occupants, we are not doing our job. I know of nothing more gratifying than saving someone's life. To do this when it is only convenient or when we have the time seems careless and disappointing.



THE "WHEN" OF COMBUSTION TESTING

Currently, HVAC contractors have access to some of the best test instruments for measuring carbon monoxide and combustion performance for all types of fuel-burning equipment.

We also have better personal monitors to keep us safe in environments that could cause someone to be poisoned by carbon monoxide (CO). So the question is, "**when**" should these test instruments be used?

For personal safety, you should monitor for CO any time you are concerned for someone's safety, whether it is your own or a customer's! Technicians should do combustion testing every time they install or service fuel-burning equipment.

In addition, they should test whenever they work in the area with other fuel-burning equipment. This test is to verify that the changes they've made don't affect other equipment. Things change, and things wear out, so it is never safe to assume anything. Just changing an air filter or cleaning an evaporator coil can have adverse effects on the venting of a water heater if there is excessive return duct leakage.

Those who keep up with the news know that many people are exposed to carbon monoxide while at home or on vacation.

THE "WHAT" OF COMBUSTION TESTING

"**What**" needs to be checked or tested? Just because you were asked to service a furnace, boiler, or water heater, you still need to check other equipment. If you are walking down a dark street at night do you only check for dangers directly in front of you or do you check for pending danger all around you?

What you check just might be lifesaving. Personal field experience has shown that total awareness of potential hazards is the only way to prevent them.

One of my interesting experiences occurred when we had to find a home for a stray cat. We found a family with a farm who agreed to take him. As a favor, I told the owner I would do a safety check on his equipment. The furnace and water heater checked out just fine. Then we

went into the family room that had a wood-burning fireplace in use. That room had a vaulted ceiling, and stairs led up to the children's bedrooms.

I found no CO in the family room, but upon checking the bedrooms, I measured 40 to 60 ppm in them. These kids were being poisoned whenever the fireplace was in use!

I told the owner what would be necessary to correct this situation and recommended a low-level carbon monoxide monitor. Not sure about the cat's life, but these kids certainly got an extension.

So, what do you check? I know that many times technicians are in a rush and just think they don't have the time to check all the "Whats." However, I know we have even less time to go back and a lot more to worry about if there is a "what" that goes wrong! Even checking infiltration from an attached garage could be a health-saving action for the occupants.

THE "WHO" OF COMBUSTION TESTING

How about "**Who**" should check, test, and monitor? Should it be up to building occupants to take care of themselves? Do you tell them to buy a carbon monoxide alarm, and they'll be safe? Well, the fact is, alarms don't make people safe. Alarms only let people know there is danger after the fact.

Who should customers expect to provide them with safe, efficient, and dependable system operation? As an HVAC contractor or a plumber, only you are potentially qualified to do this.

Every year consumers are told they should have their HVAC system checked by a qualified contractor. Rarely are they told to have their water heater or other fuel-burning equipment checked (ovens, gas logs, etc.) and tested.

Next question: what does "qualified contractor" mean? If you have a truck, a uniform, and a license, does that qualify you? It is unfortunate, but the truth is that only **NCI Combustion Performance and Carbon Monoxide Safety** trained contractors have the proper knowledge and skills to perform this task to the fullest.

There are other training programs available, but most of them are not as thorough or based on in-depth technical and scientific research.

I believe current students and NCI members are the "Who" that must do this testing. Still, the industry needs many more "Who's" out there. NCI training helps you to trust yourselves and be confident that you have the best and proven information to perform this task.

THE "WHY" OF COMBUSTION TESTING

So why do this? First and foremost, it should be every HVAC contractor's responsibility. Is the "**why**" just for customer satisfaction and benefit, or are there potential benefits for you? The answer is yes. The benefit is the opportunity!

What may appear as a simple service call can become a very profitable event. The difference is that everything you offer the customer benefits them, whether it is in health, comfort, energy savings, or equipment life. There is nothing wrong with generating more income knowing you are doing the right thing! Preventing harm is gratifying, but you are in business to make a profit.

I believe most NCI Combustion and Carbon Monoxide students regularly apply the knowledge learned in class. However, much of what they learn may be controversial, so some hesitate to take it to the next level.

Are there certain fears or obstacles that keep you from taking all the necessary steps to correct combustion issues? Are you taking advantage of all the upgrades that can benefit customers? Eliminating draft hoods, adding barometrics, and adding safety spill switches increases safety! Liability should not be the reason you are afraid, but the main reason you do correct them!

Adding fan-forced combustion air controls makes sense! Bringing in outside make-up air to better control infiltration and exfiltration provides a healthier environment!

Many of you depend on service contracts to guarantee continued income. Testing equipment and making all the necessary corrections for the best

performance should minimize the time spent on these calls and make them more profitable. It also gives you the first indication that the equipment might need replacing.

Years ago, a contractor I know had a service contract with a high school. The school had boilers that were sooting up. I advised him on how to eliminate this problem, but he didn't want to do it. It was the reason he told the school why they needed a service contract.

Things change, and unexpected problems or failures can always occur. Just because you serviced someone's system last year doesn't mean you can assume it still operates at the highest levels. You need to test! You are your customer's lifeline, and your customer is your lifeline. NCI

Jim Davis to Lead Summit 2023 Discussion

This article is based on an upcoming discussion moderated by **Jim Davis** at National Comfort Institute's 2023 **High-Performance HVAC Summit** in Branson, MO. In its 20th year, this event focuses on the High-Performance HVAC Contracting segment of the industry and promises to be something you and your team should not miss.

The focus is how high performance starts with service. In this interactive session, attendees share their experiences and approaches to keeping customers safe while generating leads from combustion testing.

If you haven't done so, sign yourself and your team up. Plan to join your peers from across the country in **Branson, MO, from April 17-20.**

You can learn about upcoming sessions, special events, registration savings for members, and more at **gotosummit.com**.

Also, **book your hotel rooms** as part of the NCI discounted block.

Jim Davis is NCI's senior instructor. His storied career is based on curiosity and discovery as he sought to solve issues that lead to carbon monoxide production in gas-fired equipment. Along the way he developed the first combustion testing protocols and field diagnostics using a digital combustion analyzer. You can reach him at **ncilink.com/ContactMe** with any questions or comments.

By David Holt

Increase Sales Success: Properly Manage Service-Generated Leads

North America's typical ducted HVAC system only delivers 57% of the equipment's rated capacity to the living space. ***That's like getting 43 questions wrong on a 100-question test!*** Back in my day, a score of 57 resulted in a big fat "F" on your report card. A failing grade is never acceptable.

The most common customer complaints associated with a failing HVAC system include:

- Flu-like symptoms (headaches, nausea, and fatigue)
- Rooms that are hard to heat or cool
- Uncontrollable humidity levels
- Too much dust throughout the space
- High utility bills
- Noisy, unreliable equipment.

High-Performance contractors know that customers are delighted when their HVAC systems operate well above these "failing grade" levels. Plus, delighting your current and future customers with above-average HVAC system performance increases sales volume and improves brand reputation.

Customer **delight** extends way beyond customer **satisfaction**. (You do know that a "C" letter grade is typically considered "satisfactory" on a report card, right?) It combines little things that "wow" your customers and shows how much you care about them.

Customers who are delighted with your business are loyal. In addition, delighted customers are more likely to provide glowing 5-star reviews, testimonials, and referrals to their friends, neighbors, co-workers, and family members.

CONVERT SERVICE LEADS INTO DELIGHTED CUSTOMERS

Your service technicians typically visit more customers than anyone else in your business. Service techs can start the "customer delight engine" that will efficiently drive your business to greater success by simply measuring and recording a few static pressures on each call.

Why should service techs measure and record static pressure on every call? If they don't measure static pressure, how can they determine if proper fan airflow is present? How can you set the refrigerant charge to proper levels if the fan airflow is too high or too low? Without the numbers, you're just guessing!

When you measure the performance levels of the HVAC system you are servicing, you become a better service provider. You can find and solve problems that others often overlook. You can create a safer, healthier, more comfortable, and more energy-efficient environment for your customers. That's what really delights your customers.

But static pressure measurement alone doesn't

get the job done. You must actually do something with that information to turn it into meaningful results. You need to treat the data like cold, hard cash. Why? Because you can convert information gleaned from the data to more work with just a little effort on your team's part.

MANAGE YOUR HIGH-PERFORMANCE DATABASE

Unfortunately, most static pressure measurements are handled very poorly in the office. Without a solid plan, these golden opportunities get stacked up in a desk drawer and fall through the cracks. This results in frustrated customers, unhappy service techs, unemployed comfort advisors, underemployed installers, and reduced company profits. The best solution is a robust database.

Many modern service management software systems let you create custom fields. If your current system allows this, you should add at least four static pressure fields on the service call record to capture static pressures for the return duct, before the blower, after the blower, and the supply duct.

Of course, NCI's **ComfortMaxx™** system is the best place to capture this performance data because it can produce meaningful reports to educate customers about your findings and recommendations.

Whatever method you use, someone in your business must be responsible for maintaining this information goldmine. If nobody is watching your valuable database, the information will be useless, and you'll miss out on many opportunities to delight customers and grow your business.

TURN DATA INTO DOLLARS

Stored data is to the business as stored seed is to the farmer. Without seeds, the farmer can't grow a crop. Without data, the business owner can't grow customer delight and profits. You must act on the data like farmers must act on the seed.

If you know what to look for, mining a database to find the best sales opportunities is simple. What could you do with a list of current customers with 18-plus-year-old equipment hooked up to a failing (57% efficient) duct system? If I were in sales, I would love to work that list!

The nice thing is, when you proactively work your database, you can decide when you need to "plant the seeds" that can sprout and turn into profitable sales. When outside temperatures are extreme, you don't need more leads; you need more people to get the work done! When it's mild outside, that's the best time to take action on your stored data and begin the educational sales process.

Once again, someone in your business must be responsible for acting on your stored performance data. You must assign someone to farm your performance database for more opportunities to delight customers and improve profits. Like an unplanted seed, it will produce no fruit unless planted and nurtured by the farmer.

ENCOURAGE AND MOTIVATE YOUR TEAM

It is common to find discouraged technicians because they don't see any benefit from the system performance data gathered on their service and maintenance calls. Not seeing the

David Holt to Lead Summit 2023 Discussion

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David Holt is NCI's director of national accounts and an instructor. You can reach him at **ncilink.com/ContactMe** with any questions or comments.

benefit is an unfortunate error. Everyone needs to see measurable results from their efforts to encourage and motivate them.

"**Lead measures**" track the critical activities that drive (or lead to) the accomplishment of an important goal. What leads to delighted customers and business growth? For High-Performance HVAC contractors, static pressure measurement is one critical activity to track. While many more critical activities should be monitored, the performance of this simple activity predicts the success of goal accomplishment. It is influenced directly by the service team.

"**Lag measures**" track the success of your most important goals. Customer education contacts, customer

delight scores, average sale price, and profitability are all critical lag measures that will not occur unless the lead activities are performed. Sharing lead and lag measures with your team can encourage and motivate them to continue performing required activities that result in greater success.

Assign someone on your team to track, monitor, and publicly report lead and lag measures. If nobody is responsible for this vital activity, you will miss out on the incredible benefits that the high-performance HVAC approach has to offer your customers, your employees, and your company.

WANT TO LEARN MORE?

High-Performance HVAC Summit 2023 attendees will benefit from the "***wisdom of the crowd***" as participants discuss how they properly manage and use the information collected on repair and maintenance calls to drive customer delight and increased profitability. See you in Branson! NCI

By Paul Wieboldt

How Room Surfaces *Affect Comfort*

In the late 1980s, our family spent a winter living in an old farmhouse in the Catskill Mountains of New York. Portions of the house date back to 1896. We guessed this from the headlines of newspapers we pulled out of the old horsehair and plaster walls we were removing in the remodel. A fuel-oil boiler in the basement heated the house by circulating hot water through baseboard radiators.

Our preference was to be near one of these radiators when a good old-fashioned blizzard was howling outside. I can still remember standing in front of one of the rattling, multi-paned windows shivering in my wool sweater, even though the soup on the kitchen stove was boiling, the wood stove was almost glowing, and the baseboard radiators kept the room a comfy 70°F or so.

UNDERSTANDING COMES LATER IN LIFE

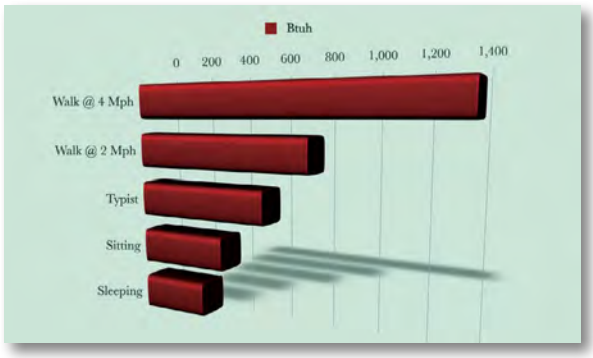
I only understood the radiant loss I was experiencing and its profound impact on human comfort much later in my life. A great many factors, both physical and psychological, are associated with being or feeling comfortable.

The heating and air conditioning practitioner must be concerned with those factors affecting the conditions which provide a healthy and thermally comfortable environment for people. To better understand how "comfort" works, we must discuss how the human body handles heat.

Food's energy (calories) is released when it's oxidized or, in a sense, burned inside the body. This process of internal heat generation is called metabolism. Internally generated heat must be dissipated. Otherwise, body temperature would rise, and a person would become ill or die.

Some of this internal energy is released as work (moving about), but most energy is converted to heat, which then transfers to surroundings.

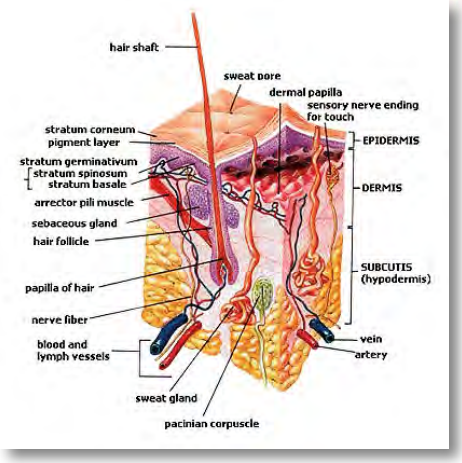
HEAT GENERATED BY A PERSON IS RELATED TO THEIR ACTIVITY LEVEL



Metabolic Rate

Heat Transfer to the Environment: The human body operates internally at approximately 98.6° F. Normally, the body's "cooling system" controls the body temperature so that it is always within a few tenths of a degree of that temperature. The skin surface temperature is typically cooler, approximately 86°F.

The primary rule for keeping a person comfortable is maintaining the environment so that the heat generated by their metabolism can be rejected at a comfortable rate. If you allow people to lose heat too fast, they will shiver



and shake. If they lose heat too slowly, they get warm and perspire.

The human body's control system reduces heat transfer to the surroundings when the body temperature begins to drop. It increases heat transfer when the body temperature rises. Heat is transferred from the body to its surroundings by **convection**, **evaporation**, **radiation**, and (to a small extent) **conduction**.

Heat Loss by Convection — As our body temperature rises from above 98.6° F, our blood vessels near the skin surface expand, allowing more blood to flow to the skin. Skin temperature rises due to hotter blood, increasing the heat lost to the air because of the more significant skin-to-air temperature difference (Delta T or ΔT).

The skin is the body's heat rejection layer or "radiator." The temperature and velocity of the air moving over the skin directly affects the amount of convective heat loss from the skin.

Heat Loss by Evaporation — Should the heat lost by convection be inadequate to remove all the excess heat from the body, the deep body temperature will continue to rise, causing the sweat glands to open. As the skin's surface becomes moist, additional heat is removed as the sweat is evaporated into the surrounding air.

In the process, the skin surfaces are cooled. The amount of evaporation (cooling effect) from the skin depends on the humidity and velocity of the surrounding air. The higher the humidity, the lower the evaporation rate; increasing air motion tends to increase the evaporation rate.

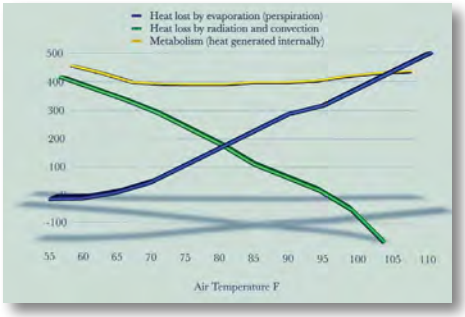
Heat Loss by Radiation — Radiation is perhaps the least understood method of body heat rejection, but it is a significant mode of heat loss. The human body receives heat energy from any surface warmer than the skin and loses heat to any surface cooler than the skin.

A classic example of radiation heat transfer is the heat received from a glowing fireplace. In this process, your body is warmed directly by the radiant energy emitted by the fire and not by the air that is in front of you. For radiant heat transfer to occur, your body must "see" the radiating surface.

As in our real-life example introduction, in the winter, the inside surface of a large window may be much colder than a person's skin surface temperature. Hence the body would radiate considerable heat to the cold window.

A person may shiver in front of the large window even though the room air temperature is normal and body heat loss by convection and evaporation is minimal. To compensate for the high radiation heat loss, a person might wear a sweater or raise the thermostat to increase room air temperature and reduce convective and evaporative heat loss.

Effect of Surrounding Temperature — The curves below illustrate how the amount of heat rejection by each heat transfer mode can change depending on the surrounding environment. As the air temperature increases, body heat loss by evaporation increases, and heat loss by radiation and convection diminishes.



At 70° F, only 100 Btuh is lost by perspiration and 300 by radiation and convection. At 90° F, the situation reverses; less heat is carried away by radiation and convection, and more heat is carried away by evaporation.

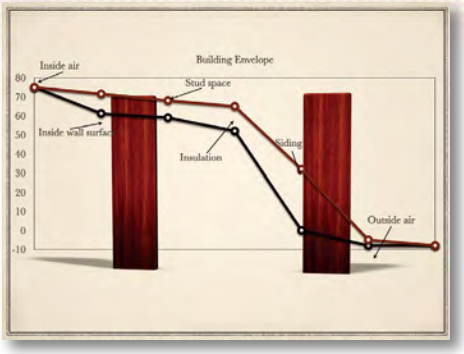
Building Envelope Affects Human Comfort — The quality of the building/room thermal envelope is a significant factor in providing human comfort. Insulation, for example, can reduce radiant heat loss by increasing inside-wall surface temperatures.

The illustration on the next page shows the temperature gradient through an insulated and uninsulated frame wall. On frigid days, the inside un-insulated wall surface temperature might be as low as 61°F while a fully insulated wall at the same outdoor conditions would be over 71°F.

This means a person would radiate less heat to an insulated wall than to an uninsulated one. It also means that

(Room Surfaces continued on page 26)

(Continued from page 24)



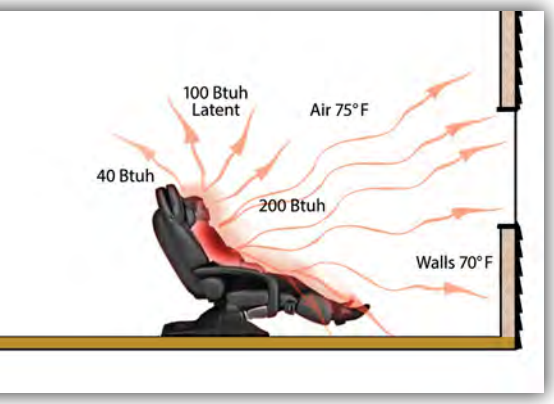
designing an air distribution system that provides a comfortable environment would be easier.

For example, a well-insulated envelope would provide a winter environment comprising 75° F room air with inside wall surfaces at a little below 70° F.

The illustration below shows how a person seated at rest might lose heat to his environment. About 200 Btuh would be lost by radiation to the colder walls and convection to the room air; perhaps 100 Btuh would be lost through evaporation.

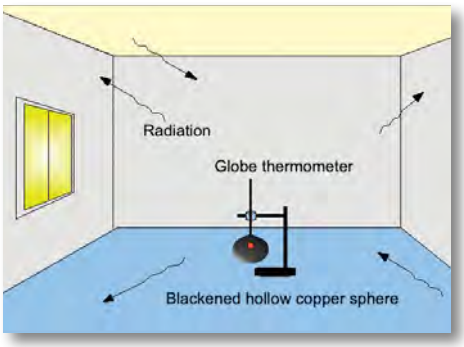
If a large amount of glass was installed or the walls were uninsulated, the wall surface temperatures would be less than 70° F, and the person would lose more heat by radiation.

Mean Radiant Temperature — Laboratory tests show that **surface temperatures** are as important as room air temperature to overall comfort. In fact, researchers suggest that increasing or decreasing surface temperatures by 1°F is the same as increasing or decreasing room air temperature by 1°F in terms of the comfort achieved.



Mean radiant temperature (MRT) is one way to measure the effect of inside surface temperatures. The MRT can be derived from equations, which consider the various room surface temperatures, or by using a "globe" thermometer illustrated in the figure below.

Experts in measuring human comfort often combine room air temperature with a room's mean radiant temperature to create an improved comfort index. This new index is called the "adjusted dry bulb" temperature. It is calculated by averaging the room air temperature and mean radiant temperature.



For example, the adjusted dry-bulb temperature for a room at 75° F with an MRT of 71 would be:

$$(75^\circ + 71^\circ) / 2 = 73^\circ F$$

The fact that the building envelope's thermal characteristics are so important in maintaining comfort means that the air distribution designer must consider inside surface temperatures (especially the amount, type, and location of glass or poorly insulated walls).

Effect of Winter Humidification — As noted, indoor humidity does affect the rate of body heat rejection by evaporation. However, if only residential and office environments are considered, the effect of significant changes in indoor humidity is minimal.

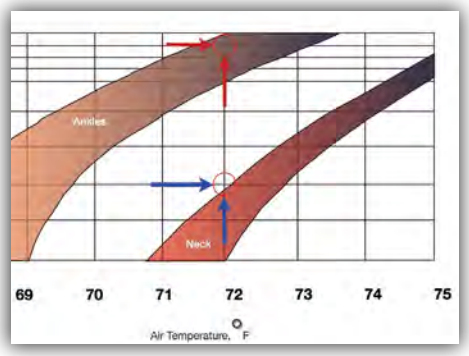
During the heating season, a change from 20% to 60% RH may go practically unnoticed by most occupants. The critical point is that while humidity is a factor in heating season comfort, the human body is more sensitive to slight changes in air and surface temperatures.

Of course, during the cooling season, people have a low tolerance for high humidity, and humidity control becomes more critical.

Effect of Velocity – The human body is sensitive to air movement, especially at rest, like watching TV, reading, working at a desk, etc. A draft happens when air with a specific combination of air velocity and temperature causes a sensation of coolness, hence the discomfort.

How fast must air move to cause a draft? It depends on which part of the body is affected by the moving air stream.

The chart below outlines comfort zones for the neck and ankles for a range of air temperatures and air velocities. At 72° F, air moving at 30 feet



per minute (fpm) would be outside the comfort zone near the neck and constitute a draft.

That same 72° F air around the ankles could be moving at 90 fpm or more and would not be felt as a draft. As the air gets cooler, velocities must be reduced to avoid discomfort.

Natural Convection — Usually, air motion in a room results from "natural" conditions. In winter, room air contacts cold glass and cold exterior wall surfaces. This cools the air. Since the cooler air is heavier, it moves down the wall and across the floor.

In summer, the reverse occurs. Room air in contact with the warmer glass and walls is heated and becomes lighter.

This air moves upward and across the ceiling. Lights and appliances can produce their own local air currents as well. Such air motion is referred to as natural convection (air) currents.

While standing in front of that wavy-glass farmhouse window listening to the wind howl and watching the snow flakes swirl, it had not occurred to me why I shivered but it did stick firmly in my memory.

In my heating and air conditioning duct designs, it effects where I locate grilles in the floor or ceiling of a room. I locate them in the vicinity of a window whenever possible so the warmest air will be there to offset the radiant glass loss we all experience.

It effects my passion for well-insulated walls and warm floors. It also effects my efforts to convince home owners and architects to use the best glass possible in their window choices.

Radiant loss seems to be little understood in our business, but as you can see, it needs to be at the forefront of our understanding in order to provide our clients with cozy comfort! NCI

Paul Wieboldt is president of Tradewinds Appropriate Technologies, Waco, TX. He has done most things when it comes to home remodeling and construction. He also started a private school, worked for a curriculum developer, and fell in love with teaching. In the mid-1980s he moved to Texas and began his career in HVAC. Several years later, he discovered NCI and was able to combine his experiences into a teaching focused on environmental comfort and health. Contact Paul for more information at paul@manualjdesign.com.

NCI ANNOUNCES A NEW CLASS

National Comfort Institute (NCI) has a new training course that will help HVAC contractors learn how to accurately complete four stages of system design.

After all, a High-Performance HVAC system starts with the right design.

High-Performance HVAC Design and Redesign focuses on NCI principles as well as ACCA (Air Conditioning Contractors of America) Manuals J, S, D, and T using the Elite RHVAC software package.

This is a three-day course that has seven 50-minute learning modules. It is taught with a live instructor, uses interactive discussion, and includes many visuals to help attendees with both written and hands-on exercises.

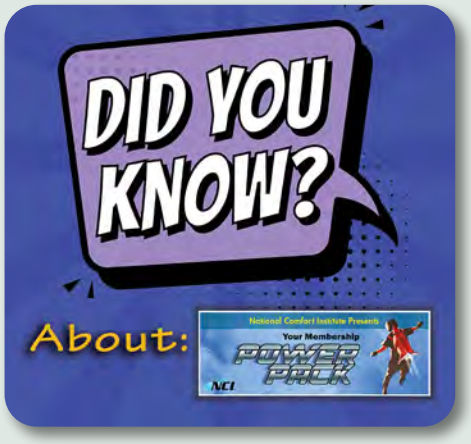
Though not a certification class, contractors and technicians who complete this training will be able to use computer-based software to design properly-sized HVAC systems that conform to NCI performance-based principles to ensure an optimized system.

This is a stand-alone course that requires basic computer literacy. The course is designed for HVAC contractors, company leaders, technicians, installers, salespeople, and more.

The course was first taught earlier this month in Austin, TX by Paul Wieboldt of **Tradewinds Appropriate Technologies, LLC**. The next class is scheduled for April 25-27 at RE Michel Co. in Baltimore, MD.

Check out future training in 2023 by **clicking here**.

Questions? Be sure to call NCI's customer help line at 800-633-7058.



DID YOU KNOW ... ?

Members of National Comfort Institute (NCI) enjoy many benefits. One of them is a monthly download/access feature known as the PowerPack.

Each month's PowerPack is designed to help members explore different tools they can use in their high-performance contracting businesses.

These tools consist of step-by-step instructions for using various test instruments. Plus there are articles on everything from how to implement performance into a company, to the best ways for selling air upgrades, and more.

The PowerPack also provides access to a variety of NCI online-based training modules, and so much more.

None of these tools are available to non-members.

As a member, if you haven't taken advantage of your PowerPack tool benefits, don't wait. Go to **ncilink.com/PwrPak**.

If you aren't a member but are interested in learning more, visit **ncilink.com/NCIMembership** or call 800-633-7058.

DO YOU KNOW ABOUT AIRMAXX™ AND AIRMAXX LITE™?

In this digital age, having software to help with calculating equipment-delivered airflow and understanding its overall performance is more important than ever. National Comfort Institute members have some amazing advantages if they use the organizations ComfortMaxx family of software for these purposes.

AirMaxx™ is a mobile app that is included for all NCI members or **ComfortMaxx™** subscribers. With it, you can calculate the following:

- Total External static pressure
- Supply Duct static pressure
- Return Duct static pressure.

AirMaxx Lite™ is a free-version of AirMaxx that is open to the public. It doesn't do everything that the full version does, but is good enough to help your field team calculate TESP and communicate HVAC equipment delivery performance relative to its rated static pressure.

AirMaxx™ a ComfortMaxx app

AirMaxx also easily communicates equipment performance in delivering airflow relative to what it is designed to deliver. It can identify which components are causing stress to that airflow delivery.

The cool thing about AirMaxx is that once its downloaded to a mobile device, it does not require a WiFi connection!

Both of these apps are Android and iOS friendly. AirMaxx is cloud-based software that requires NCI membership and a subscription.

Learn more by calling the NCI Customer Care line at 800-633-7058. NCI

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By Dom Guarino

Remembering Rob Falke

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It's been almost a year since our industry lost one of its greatest pioneers. Rob Falke was a mentor, friend, and brother to me, and to countless others as well. Together we founded National Comfort Institute (NCI), as a fledgling training organization exactly 30 years ago.

We built the organization brick-by-brick, adding many new disciplines and great people to our ranks over the years.

We had a saying, even in the very early years that "the pioneers are the ones with the most arrows in their backs." I can assure you we plucked out quite a few over the past three decades!

Rob was known as the father of modern Residential and Light Commercial Air Balancing. But he was also known by the thousands of people he touched as one of the most caring and kind individuals they'd ever met. He was often affectionately referred to as "Doc Falke" by many.

EDUCATION WAS HIS DRIVING FORCE

Rob diligently worked to help contractors understand the concepts of HVAC performance. Just as important, he taught contractors how to teach customers about it, and help them understand the value of having someone trained in NCI's disciplines service or replace their system.

Education was at the core of everything for Rob, yet interestingly he had no formal training in education. Instead, he intensely focused on how to teach so that just about anyone could understand complex concepts. One of Rob's favorite tongue-in-cheek terms was, "butt-crack simple!"

But Rob was anything but simple. He had a natural curiosity and a will to unravel just about any technical challenge he came across. Many times I would hear him in his office, which was next to mine, pronounce with glee, "I got it!"

Countless brainstorming sessions would ensue with each of us trying to poke holes into a theory or a process. It's what gave NCI the solid foundation upon which all of our training was built. Rob was never afraid to challenge or be challenged. It was in his DNA.

ASHRAE 221

His life's work in HVAC culminated in helping to create the **ANSI/ASHRAE 221 Standard**. For many years we worked on developing solid practices to quantify the performance of an air distribution system and how it impacted the overall performance of an entire HVAC system.

Rob Falke

Once we honed it down, we realized we couldn't hoard this knowledge and we had to share it with the entire industry. In 2016 Rob embarked on a four-year odyssey to make this a reality. He assembled a group of some of the finest minds in our industry with no-nonsense, real-world understanding of how things work in the field.

With the help of some prominent ASHRAE members he formed and chaired what became known as the ASHRAE 221P committee. Proposed Standard 221 was titled a "Test Method To Field-Measure And Score The Cooling And Heating Performance Of An Installed Unitary HVAC System." Development of the 221 standard hit some bumps and potholes along the way, but in a record four short years it became a reality.

ROB'S IMPACT ON NCI

Last March at NCI's High-Performance Summit, Rob gave his closing talk about what we had

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just experienced as an industry coming through the pandemic. He shared a Chinese symbol for the word, "Crisis," and explained that the symbol portrayed **Crisis** as **Danger** coupled with **Opportunity**.

危险

Danger Opportunity

How were we to know at that time that NCI was about to lose one of its greatest treasures? Rob's loss, just as we were coming out of the pandemic early last year, was a gut-punch like I've never felt before. Everyone at NCI felt a bit in crisis, especially myself and David Richardson, who took on many of Rob's duties and had big shoes to fill.

But with Rob's smiling eyes watching over us, we overcame what could have been a serious crisis. We made an early decision to recognize the danger, but not succumb to it. Some of that determination was to make sure we honored Rob's legacy.

Rob's absence was felt immediately and intensely. But we also knew he would have wanted us to keep pressing forward, and keep exploring new opportunities, not just for NCI, but for the tens of thousands of HVAC professionals we have had the privilege to train and be associated with.

So we quickly regrouped and set out to make NCI and our followers better, stronger, and more united than ever. Now, almost a year later, we are well down that path, and in words that Rob and I often shared year after year, we feel like "we're just getting started!"

Rob, you'll be missed but never forgotten. Your legacy will, without a doubt, endure the test of time. I know that legacy was very important to you. You can rest easy because you have accomplished that and more, my old friend.

Someday I know we will meet again, and you'll have lots to share with me about what you will have learned about the rarefied air up there. God bless and keep you my friend and brother, always. NCI

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PUBLIC LIVE TRAINING

High-Performance HVAC Design and Redesign
April 4-6: Austin, TX
April 25-27: Baltimore, MD

Residential HVAC System Performance and Air Balancing Certification Bundle
April 4-6: Plymouth, MN

Airflow Testing and Diagnostics
April 11: Lubbock, TX
April 13: San Antonio, TX
April 25: Fenton, MD
April 26: Fenton, MD
April 27: Belleville, IL
May 2: Lafayette, LA

Commercial Air Balancing Certification Program
May 2-4: Glen Burnie, MD
May 2-4: Livonia, MI
May 9-11: Monroeville, PA

Duct System Optimization and Air Balancing Certification Program
May 16-18 : Lansing, MI
May 23-25: Richmond, VA

PUBLIC ONLINE LIVE TRAINING

Residential HVAC System Performance - *ONLINE LIVE*
May 2-3: **Part 1** & May 9-10: **Part 2**

Refrigerant-Side Performance Certification Program - *ONLINE LIVE*
May 11-12: **Part 1** & May 18-19: **Part 2**

*SCE SPONSORED LIVE TRAINING

Test & Certify Ventilation Systems and Economizers Certification Program
April 4-5: Anaheim, CA

Commercial System Performance Certification Program
April 11- 12: Anaheim, CA

Airflow Testing and Diagnostics
May 2: Anaheim, CA
May 23: Tulare, CA

Hydronic Testing, Adjusting, and Balancing
May 3-4: Tulare, CA

Airflow Testing & Diagnostics Implementation Workshop
May 16-17: Anaheim, CA

Refrigerant-Side Performance Certification Program
May 24-25: Tulare, CA

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Residential HVAC System Performance and Electrification
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April 25-27: Anaheim, CA

High-Performance HVAC Design and Redesign
May 3-5: Sacramento, CA
May 8-10: Anaheim, CA

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