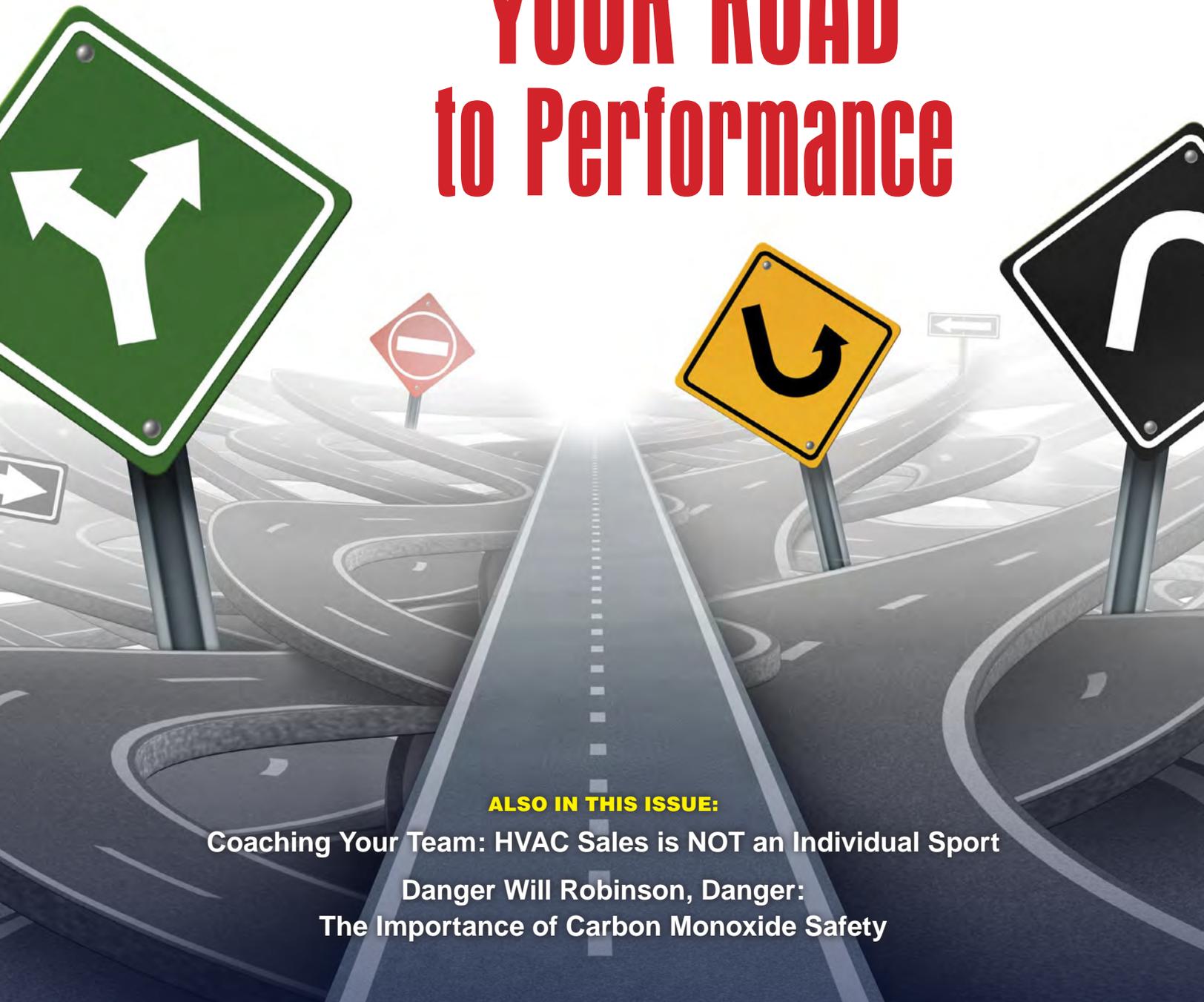


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ALSO IN THIS ISSUE:

Coaching Your Team: HVAC Sales is NOT an Individual Sport

**Danger Will Robinson, Danger:
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COVER STORY:

Take the PATH to Airside Performance: Part 1

This is the first of a six-part series on the concepts of PATH and how to make it part of your company. Part 1 begins with an overview.

DEPARTMENTS

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SALES:

Coaching Your Team: HVAC Sales Is NOT an Individual Sport

"Always Be Coaching" is the theme of the 2020 Summit and David Holt shares his thoughts on how to coach your sales team so they can achieve success.



TECHNICAL:

Danger Will Robinson, Danger!!

Jim Davis shares four case studies that show how important warning systems are when it comes to detecting carbon monoxide.

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Cybersecurity: Don't Worry - Take Action



Mike Weil is editor-in-chief and director of communications and publications at National Comfort Institute, Inc. He can be reached at ncilink.com/ContactMe

The entire world has gone mad. The Pandemic rages, politics has everyone on edge, the economy is anything but stable. Lurking behind all that is the ever-increasing threat of your business being attacked by cybercriminals.

Back in 2014, I wrote several articles for another publication about the HVAC Industry's vulnerabilities throughout the value chain. That's back when the biggest headlines were about hackers grabbing up millions of credit card numbers and other data from giant retailers like Walmart.

In the Walmart case, it was later discovered the breach happened because of another one – a hacker gained access to a commercial HVAC contractor's servers and then piggy-backed through them into Walmart's servers.

The level of sophistication and brazen audacity of such attacks has increased exponentially in the years since those articles were written. In fact, according to the U.S. Small Business Administration (SBA) website (ncilink.com/SBACyber), a fairly recent FBI Internet Crime Report showed the cost of cybercrimes reached \$2.7 billion JUST IN 2018!!!

Today's headlines are even worse. In the **Wall Street Journal** (July 17, 2020), the front page, headline screams, *Russia Blamed for Hacks Tied to Virus Work* (ncilink.com/RussiaHackers). I mean, is nothing safe?

But this threat isn't just targeted to major sites and social media. Did you know that new data breaches surged by 424% last year, fueled by hackers targeting more small businesses?

This is based on a study conducted by an organization called **The Manifest** (ncilink.com/CyberStats), which surveyed 383 small business owners and managers who use mobile apps and/or websites to connect with their customers.

The question is – what have you been doing to protect your business and your customers? According to the Manifest study, only about one in five businesses admit they need to devote more resources to cybersecurity and could improve the security of customer data storage.

DON'T LET FEAR STOP YOU

The SBA article cited earlier has a number of tips on what you can do to get started. They highlight the common threats, explain how to assess your business risk, and share cybersecurity best practices. Like everything else in life, cybersecurity requires training and practice. But you must start.

One way to begin is to download a free document published by the FCC, entitled *CyberSecurity Planning Guide* (ncilink.com/CySecManual). This provides a good initial education on the subject and can help you start and/or improve your cybersecurity plan right away.

For many, cybersecurity can be overwhelming. Consider using a third-party specialist that can handle the details and keep your company security up-to-date and safe. There certainly is a cost to this, but think about the cost to you and your business if your data is compromised.

Also consider The National Cyber Security Alliance (NCSA), which can be found at ncilink.com/NCSA as a resource.

Furthermore, I found a number of sites that provide tips on how to choose a cybersecurity partner. One, in particular, Tech Stack stood out (ncilink.com/techstack).

So don't let worry stop you. Take action. Now.

While you can never make your firm completely bulletproof, prevention and planning can greatly reduce your risk. A practical plan and policy will help you bounce back much faster, should your data be breached. 

NCI Test Port Plugs

I can still remember the first time a contractor friend of mine came up to me and said, "Hey John, I was on one of your jobs a couple of weeks ago."

"How do you know that?" I asked.

"It had blue plugs all over it," he said.

That wasn't the only time I was approached and told about those "blue plugs." Early in my testing days that became the "signature" that I had been there.

What I am talking about are National Comfort Institute's (NCI) Test Plugs. They always led to conversations with customers and contractors. They allow Performance-Based Contractors to start the necessary conversation with customers about the "High Blood Pressure" of their HVAC system.

NCI Test Plugs serve at least two pur-

poses. The primary purpose is to stop air leaking from the equipment or duct system on which you installed the port. It keeps moisture and dirt out as well.

Secondarily, the installer of these plugs into test ports knows that anybody from his or her company doing a follow-up just needs to remove the plugs to check equipment static pressure, or component pressure drops: coil, filter, duct fitting, and so on.

On future service calls, every time a service technician shows up, they save time when it comes to taking static pressure and/or pressure drop readings. This decreases the overall diagnostic time of the call.

As an added bonus, these plugs have a tapered design for superior sealing ability with a "pull tab" making it easier to re-



move from the test port.

NCI's test port plugs come in bags of 100, in two sizes, 3/8" and 1/2", with a 500-minimum quantity for purchase.

Use these in conjunction with NCI's line of static pressure kits, test port tap kits, and static pressure stickers, which you can find in our store. Go to ncilink.com/BluePlugs for more information or to order.

— by John Puryear, NCI Instructor



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PART 1: AN OVERVIEW

The PATH to Airside Performance

It takes commitment and discipline to implement HVAC airside performance testing. One of the biggest obstacles is to decide where to start. With so many options, it can drive you crazy figuring out what should come first. I've found one concept that I call PATH which helps prioritize skills you must learn to master system performance.

PATH is an acronym for Pressure, Airflow, Temperature, and Heat. These are the components that airside performance revolves around. Think of each piece as a step on your pathway to building extraordinary HVAC systems. The acronym also represents a sequential way you can add testing, diagnostics, and system upgrades to your HVAC service offerings.

This article is the first in a six-part series on the concepts of PATH and how to make it part of your company. In this first part, we will overview each step and offer some simple ways to get started. The remaining articles will dive deeper into the meaning of each PATH letter. By the end of the series, you will have some simple and practical ways to easily apply and prioritize these principles for your sales, service, and installation.

The PATH to Performance: A Six-Part Series

Over the next several months we will feature articles detailing the keys to the PATH (Pressure, Airflow, Temperature, and Heat). Subsequent articles will go into more detail on each of the four keys and help you overcome the paralysis of trying to implement everything all at once in your company.

Remember, practice makes perfect. So, as David Richardson explains, become proficient in each step before proceeding to the next. In the end, you will be able to deliver the greatest value in service and performance that your customers have ever seen. And that will help you deliver the most well-deserved profits to your bottom line.

Next month David will address more details on static pressure testing. Stay tuned!

PRESSURE

Static pressure is the first step on the airside performance path. It is a foundation for airside performance and an indicator of overall HVAC system health.

Total external static pressure (TESP) (ncilink.com/HartmanTESP) is the first test to master. It uncovers hidden airflow restrictions that lead to premature equipment failure and comfort issues. To diagnose TESP, compare your *measured* TESP to the *maximum-rated* TESP found on the equipment nameplate. If measured TESP exceeds rated TESP, you need to investigate further to figure out why.

A simple blood pressure comparison can help you understand why it's important. High static pressure — just like high blood pressure — means you are getting ready to have major issues and are probably not healthy.

To help visualize this relationship, you can use the NCI *Static Pressure to Blood Pressure Tables*. If you are a registered user of the National Comfort Institute (NCI) website, you can download a copy at ncilink.com/SPTtoBP.

If not registered, it is easy and free to do so. Just go to ncilink.com/NCIWebReg and sign up.

AIRFLOW

Airflow is the second step on the PATH to performance. It is key to a well-performing and long-lasting system. Without it, you won't achieve rated efficiency and the system will suffer long-lasting negative effects.

Many customers have endured low airflow issues for years but never had it pointed out through measurement. You can plot fan airflow on a fan table to begin the troubleshooting process.



Once you measure TESP, plot it with the fan speed setting on a fan table to estimate fan airflow. This helps you see approximately how much air the fan is moving.

To diagnose, compare plotted fan airflow (ncilink.com/PlotFanAir) to what the equipment needs for proper operation. You can also look at a fan table to see the relationship between elevated static pressure and airflow.

TEMPERATURE

Temperature is the third step. It is an important aspect of system performance that you might overlook. The air handling equipment could have correct airflow, but without proper temperatures, comfort and efficiency won't happen.

Start with four temperature measurements to see how much influence the duct system has on the system's delivery of comfort and efficiency. Measure the following air temperatures while the system is running to show their impact:

- ◆ Temperature entering equipment
- ◆ Temperature leaving the equipment
- ◆ Temperature at the farthest supply register
- ◆ Temperature at the farthest return grille.

Once you have these four readings, use them to calculate duct system temperature losses (ncilink.com/Duct-Loss). Such losses provide a lot of insight into why a properly sized system

can't keep up and why oversized equipment appears to work correctly.

HEAT

Heat (delivered capacity) is the last step on the airside performance path. It provides proof that your work does what you said it would. As a result, you can show that customers received what they invested in.

Delivered capacity defines real airside system performance.

Btuh (British thermal units per hour) is the measurement for delivered capacity. The number of Btus shows how much heat the HVAC equipment and duct system transfers.

Master airflow and temperature measurements before you move to this last step. Then start by measuring sensible Btus at the equipment. First, plot fan airflow and record it. Next, measure temperature entering and exiting the air-handling equipment. Let the system run for at least 15 minutes and then record your equipment Δt (temperature difference).

Plug these readings into the sensible heat formula ($\text{cfm} \times \Delta t \times 1.08$) and see how close you are to manufacturer specifications.

If your readings are within $\pm 10\%$ you're doing great.

DON'T FREEZE

Unfortunately, it's easy to freeze when you stare down the performance

PATH. Don't make the mistake of trying to do everything at once — it results in paralysis. Also, don't believe the **multitasking myth** (ncilink.com/MultiTaskMyth). It is proven untrue.

You can achieve airside performance success one step at a time.

You need a strong purpose and vision for how you want to use these measurements. You have to share that purpose and vision with your team. Otherwise, their importance will quickly fade for the team members in your company.

Look for the remaining articles in this series as I focus on one step of the path at a time. I hope these articles will help you steadily reach your goals. Remember, small consistent steps and habits pave the way to extraordinary HVAC systems. 



David Richardson serves the HVAC industry as a curriculum developer and trainer for National Comfort Institute, Inc. (NCI). NCI specializes in training focused on improving, measuring, and verifying HVAC and Building Performance.

If you're an HVAC contractor or technician interested in learning more about airside performance, contact David at ncilink.com/ContactMe or call him at 800-633-7058. NCI's website www.nationalcomfortinstitute.com is full of free technical articles and downloads to help you improve your professionalism and strengthen your company.



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Coaching Your Team: HVAC Sales Is NOT an Individual Sport

When asked "who's in sales around here?" most HVAC company team members point to their "comfort advisors." WRONG answer! Everyone on the team plays an important role in the sales process and they all need coaching to be successful.

Sales coaching is all about developing your people, improving performance, and achieving sales goals. It is best thought of as a behavior rather than a task. The focus must be on helping team members self-assess and self-discover ways to solve problems and grow.

The main objectives of sales coaching are to:

- ▲ Strengthen relationships
- ▲ Inspire self-motivation
- ▲ Assess strengths and areas for improvement
- ▲ Develop knowledge and skills
- ▲ Change behaviors
- ▲ Measure performance and provide ongoing feedback.

Ultimately, the goal of sales coaching is to create an environment where team members feel self-motivated to grow, excel, and take greater responsibility for what they do.

Effective sales coaching is the key to long-term performance improvement and organizational success. In fact, it is one of the most important jobs an owner/sales manager has.

SALES MANAGEMENT

It takes a certain kind of individual to step into a sales manager role — and an even more unique one to be successful at it. While most HVAC businesses are small companies that can't justify hiring a dedicated sales manager, the need for sales management and coaching still exists.

In the absence of a sales manager, the company owner, general manager, or comfort advisor

assumes the role on a "part-time" basis. Unfortunately, coaching their team (and themselves) to high-performance sales results is not something they know very much about, so their efforts are limited and typically fall short.

Out of frustration they focus more on closing sales with the **one** customer in front of them, not developing everyone on their team to improve the overall sales experience for **all** customers. This leads to burnout and lackluster long-term sales results.

So here are some thoughts on how to avoid this issue and get the sales results you need and deserve.

BEGIN WITH A TEAM GOAL IN MIND

Sales managers know they must drive performance through their team if they are to ever meet the company's long-term growth and sales goal. Sales success always begins with setting SMART goals.

SMART =

Specific, **M**easurable, **A**chievable, **R**elevant, **T**ime-bound.

Following the SMART goal formula, the entire team understands **specifically** what must be accomplished; how related activities and results will be **measured**; that the goals are very **achievable** and **relevant** to the company's success; and the **timeframe** within which the goal is to be accomplished.

Teams Require Players — A "team" goal can't be achieved by a manager alone, yet many sales managers often resort to herculean efforts to win deals for their company individually. When managers don't engage their entire team, co-workers begin to believe that their efforts aren't needed. This is very dangerous.

Your sales team includes multiple players



who perform essential tasks including:

- ▲ Generate leads
- ▲ Answer phones/respond to emails
- ▲ Set appointments
- ▲ Perform pre-call research
- ▲ Build trust and rapport
- ▲ Survey customer needs and wants
- ▲ Survey technical factors
- ▲ Review findings and recommendations
- ▲ Present priced options
- ▲ Offer consumer financing
- ▲ Confirm work order approval
- ▲ Create scope of work
- ▲ Stage equipment & materials
- ▲ Perform scope of work
- ▲ Confirm system performance levels
- ▲ Verify customer delight
- ▲ Collect final payment
- ▲ Perform accurate accounting
- ▲ Request testimonials & referrals

▲ Maintain system performance.

Without a doubt, this requires a concerted team effort to win in the HVAC repair and renovation business.

PLAYERS REQUIRE COACHES

When you ask sales managers if sales coaching is an important aspect of their job, most are sure to agree. However, in the fast-paced HVAC world, it is easy to avoid investing the time required for team and individual skill development activities. After all, the most important thing is selling that job today, right?

The main objectives of sales coaching are to accelerate learning, achieve behavioral change, and improve results. All objectives are equally important because they bring about the true benefits of sales coaching. Unfortunately, most managers tend to focus

their attention solely on today's numerical results. This is a mistake.

Numbers are great indicators; they tell you where there is success or pain. As Lord Kelvin says, "When you can measure what you are speaking about and express it in numbers, you know something about it. But when you cannot measure it or when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind."

While that is true, numbers only tell half the story. To be a truly effective sales coach, managers must learn that sales coaching is not just about numbers — it is about effective learning and impactful behavior change.

To truly build a sustained and high-performance coaching culture, one must first understand the true challenges that prevent success.

- therefore don't value my experience?
- 5. Do they have a hard time seeing the behaviors they need to change?
- 6. Are they not willing to commit to taking action personally?
- 7. Are they unable to manage their own emotions?

In the end, your success as a coach is about both you and your teammates working together with you acting as a guide, and your player doing the hard work of change.

The next step is to recognize the difference between effective and ineffective sales coaching approaches.

EFFECTIVE SALES COACHING TIPS

Not all approaches to sales coaching are created equal. Sales coaching approaches fall on a continuum from



"directive" to "developmental."

In "directive coaching," the coach serves as an expert, **telling** the team member what the problem is and how to fix it. Conversely, in "developmental coaching," the coach serves as a resource and **asks questions** to help the team member self-discover and decide on the best action.

Directive coaching is less effective than its developmental counterpart because directive coaching is more

about telling or evaluating rather than questioning and developing.

Shifting to a more developmental approach requires the manager to change the dynamic of how and when they interact with teammates.

UNDERSTANDING WHEN TO COACH

A formalized coaching plan is important, but equally important is a manager's ability to find coachable moments in unplanned conversations. Knowing how to balance the two opportunities will ensure that sales coaching becomes a part of your company culture.

Some examples of formalized coaching opportunities include:
▲ Sales team meetings



See David Holt During the All-New Virtual Summit 2020

The **High-Performance HVAC Summit 2020** is happening on October 5-7. This year it will be held live, online – a virtual event. National Comfort Institute's Coach David Holt is one of four presenters showcasing the importance of coaching your team to high performance and this article is based on his upcoming session.



This online, live Summit will include many of the same events normally held during past in-person Summits. These include breakout sessions, awards presentations, and a Virtual Tradeshow (where you can learn about the latest products and services from our industry partners).

Virtual Summit 2020 will also feature several general session speakers, a special contractor panel discussion, and the presenting of our coveted NCI contractor and individual awards.

Virtual Summit 2020 offers you and your team the opportunity to not only hear from some of the Performance-Based HVAC Industry's finest, but also a chance to virtually network with like-minded contractors from across the nation.

Learn more about the **Virtual High-Performance HVAC Summit 2020** online at GoToSummit.com.

COMMON COACHING CHALLENGES

Let's face it, coaching is a tough job. The fact that most HVAC companies are too small to employ a full-time sales manager/coach makes it even tougher. Great coaches recognize their deficiencies and search for ways to conquer them.

Coaching can be an extremely rewarding experience. However, there are times when the coaching relationship can become frustrating for both participants. That frustration is most likely rooted in the answers to these seven questions:

1. Do we enjoy a trusting relationship?
2. Am I asking, listening, and guiding, or am I simply telling?
3. Do they expect me to solve their problem or guide them to their own solution?
4. Do they "know all the solutions" and

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- ▲ One-on-one meetings
- ▲ Pre-call planning for an upcoming customer meeting
- ▲ Post-call customer meeting debriefs.

Some examples of informal sales coaching opportunities include:

- ▲ Signs that things are off track or not working
 - ▲ Celebrating and encouraging successful behavior changes
 - ▲ Your observation of a customer interaction or pattern of behavior
 - ▲ Feedback received from internal or external sources
 - ▲ Teammates asking for help or support
 - ▲ Follow-up necessary to ensure progress.
- Sales managers and leadership should

always be ready to pivot into coaching mode to encourage positive behaviors and proactively seek to improve skills.

EFFECTIVE SALES COACHING ACTIVITIES AND TECHNIQUES

Adopting effective sales coaching methodologies helps teams move towards more self-motivated behavior because it meets their psychological needs for autonomy, relatedness, and competence.

The following seven techniques will help managers become more effective sales coaches:

1. PREPARATION – Managers need to invest a few focused minutes prior to planned coaching sessions to engage team members, minimize defensiveness, ask thought-

provoking questions, then share thoughtful perspectives, feedback, and ideas. It is best to focus on a preliminary assessment of positives, gaps, and desired outcomes, as well as the evidence that supports the assessment.

2. CONNECTING – The human connection between a manager and a team member gives coaching its power. Without mutual respect and trust, learning won't take place. Position yourself for a productive, open, and collaborative interaction by first connecting with the team member on a personal and professional level.

3. ASSESSING – Improving performance begins with a clear assessment of the current situation. Identifying performance gaps represents an opportunity to im-

prove. The manager and player must align their understanding of the behaviors that need to change.

This is achieved by asking focused, drill-down questions, then listening to the answers to gain a more complete understanding.

4. ANALYZING – Analysis helps all parties identify the root issue (typically a knowledge, skill, or will issue, or a combination of the three) that is preventing the desired behavior. These issues are not always related to poor attitude. Many will-based issues are emotionally rooted in fear. Identifying the underlying fear often reveals a lack of skill or knowledge.

5. ADDRESSING – Improving selling skills requires a clear action plan. The teammate should partic-

ipate in brainstorming solutions. The coach can step in to guide the team member in evaluating those ideas to figure out which solution is best.

Participation on the part of the teammate results in ownership of the solution. Managers in coaching conversations must be careful to avoid falling into the role of being an expert who tells.

Let teammates talk and share ideas.

6. COMMITMENT – Every coaching conversation should end in a commitment to specific behaviors and actions that will strengthen performance. This is the time to ensure that the team member is truly clear on agreed-to actions and next steps that maintain accountability.

In addition, this is a good time to re-

inforce the relationship on a human level. Offer encouragement and state your belief in the team member's ability to succeed.

7. ACTION – Follow-up is the coach's job. The goal of follow-up is to affect change, create an atmosphere of accountability, and demonstrate commitment to coaching. Recognizing incremental improvement and providing encouragement will motivate the teammate to continue down the path to behavior change.

Effective sales coaching creates an environment where team members are self-motivated to grow, excel, and take greater responsibility for what they do. Your team's long-term performance is dependent on your success.

Go get 'em, coach! 

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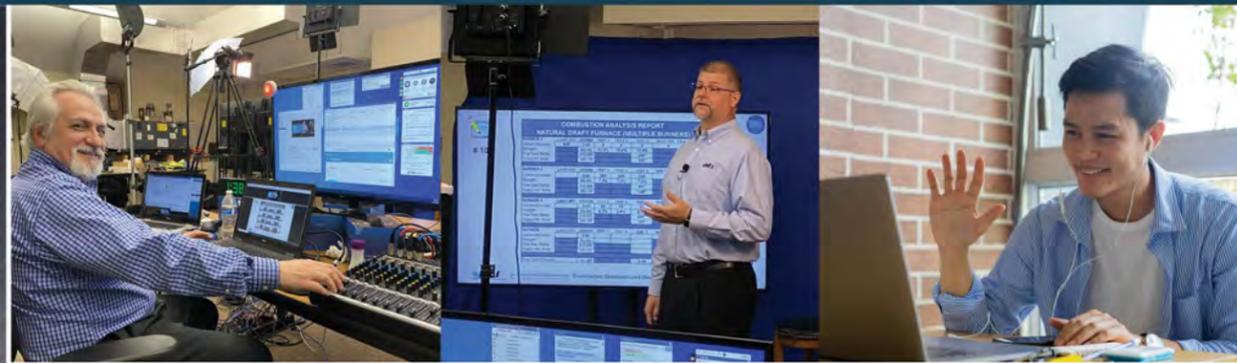
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ABC: ALWAYS BE COACHING

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How We Will Integrate Performance Testing into Service and Installation

Workshop Leader: Casey Contreras

Coaching Your Sales Team:

How We Will Market and Sell High Performance

Workshop Leader: David Holt

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Danger, Will Robinson! Danger!

I'm not sure if they still show reruns of "Lost in Space (ncilink.com/DangerWR)" – a 1960s era science fiction television series about a family who crashed their spaceship on an unknown planet.

Whenever there was imminent or pending danger, this family's robot, aptly named "Robot," would warn them by waving its silly arms while spinning around and saying 'Danger! Danger!'

So, what does this have to do with the HVAC Industry? It reminds me of the need we have for some kind of warning in our homes and workplaces when imminent danger is afoot.

We might not have a robot or droid to do this, but today we do have the tools to help avoid harm or pending danger for ourselves and our customers. A personal carbon monoxide (CO) monitor and the power of observation are the tools I would like to discuss.

Whenever providing service for a customer, especially on the combustion side, we must be aware of our environment and surroundings. Even then we can be caught by surprise.

Following are four cases I experienced over the years to demonstrate what I'm talking about.

CASE 1: A MISBEHAVING WATER HEATER

In the early 1980s, I entered a 48-unit apartment building basement with a contractor to do a combustion test and energy audit on their boiler and propose a possible upgrade. During this time, the first digital combustion analyzers appeared in the market and were quite expensive. So, everyone borrowed mine, meaning they also *borrowed* me.

I placed my combustion analyzer on the floor (they weren't exactly handheld back then, weighing in at 45 lbs.), turned it on to warm up, and then I glanced around the room. A good 50 feet from the boiler was a commercial, tank-type, water heater. It was firing. I was sure because I could see flames shooting up the outside of the water heater.

I did not think this was normal. I tapped the contractor on the shoulder and told him we needed to check it out. His initial comment was he wasn't there to look at the water heater, but once

I picked up my analyzer and told him I was leaving, he changed his mind.

We did a combustion test on the water heater and the CO was over 5000 ppm and spilling into the basement. When the water heater was inspected, it was found to be 90% plugged with soot. Even though the water heater was plugged, and little was going up the flue, the draft in the flue was $-.05$ " W.C.

This is a good indication that the flue was functional with plenty of combustion air. So why was it so full of soot? It is hard to say how many people living in this apartment were getting sick, or for how long. Of course, these are things only discussed with the owner or property management company.

The contractor ended up with an \$800+ unexpected repair and the water heater didn't blow up, catch on fire, or poison us while we were there.

CASE 2: BEWARE OF AIR GRILLE LOCATION

In another example, I joined a different contractor to conduct combustion tests on some high school boilers. They were running safely with low CO, but were not really efficient. Suddenly, a personal CO tester that I brought into the room started beeping with high readings.

This was an analog meter with a needle, and it was pointing to *Run or Die!* Several of us were already feeling light-headed. We shut off the boilers and ran! Where was the CO coming from? The boilers weren't making it, plus testing verified they were venting just fine.



The "Lost in Space" television series produced by Irwin Allen and originally aired from 1965 to 1968 on the CBS television network.

It was around 45°F outside. We went out for fresh air and noticed buses were idling in the parking lot, close to the building, getting ready to pick up the school kids at the end of the day.

One of the buses was idling less than three feet from the combustion air grille going into the boiler room and its exhaust fumes were heading in that direction.

By the way, there were also classroom windows just above that grille. We ask the driver to move and alerted the school maintenance department to add some "NO IDLING" or "NO PARKING" signs in this location.

I wonder if this ever affected school kids. Would I be writing this if there hadn't been a CO detector checking the room?

CASE 3: THE 'MIGRATION' AFFECT

Another situation occurred during a visit to an industrial plant. The team there just wanted to see a demonstration of a combustion analyzer. I didn't have a personal CO monitor to use at this location.

I turned the combustion analyzer on for its 60-second warm-up and calibration. When completed, the

screen flashed *ERROR-CO AMBIENT*.

This meant the CO in the boiler room was more than 100 ppm. The boilers were turned off and the room ventilated as we waited outside.

The next time, before entering, the analyzer was warmed up outside the room, so CO could be measured immediately upon entry. The CO was reduced and the area was safe to enter. The first

boiler was turned back on and tested.

The CO in the flue jumped to over 3,000 ppm very quickly, which meant it was out of adjustment. It was a sealed flue with plenty of draft and no apparent leaks through gaskets or access panels. However, the CO in the room started to build up again. Where was it coming from?

Looking at the combustion air grilles, we found they faced a field and some woods so nothing on that side of the building could be putting CO into the room. Furthermore, there was nothing in the plant making CO.

For some reason I can't explain, I placed the analyzer probe in the combustion air grille and measured 150 ppm of CO coming into the room. We later determined that CO was migrating across a flat roof, coming down the wall of the building, and re-infiltrating the mechanical room.

Through investigation, we discovered that CO can become heavier than air below 32°F. This later explained confusion caused in other buildings where there were poisonings, yet CO was found on the opposite side of the building rather than where the equipment was located.



**CASE 4: SURPRISE!
YOU'RE POISONED!**

In the last scenario I actually got poisoned, making me sick. I was teaching a Combustion/CO class on the roof of a maintenance building that had two packaged units on it.

The first unit tested was making well over 2000 ppm of CO. Fortunately, I was able to insert and secure the analyzer probe in the vent without holding it, which let me keep my distance from the flue and kept me from breathing any CO.

The next packaged unit was not so easy. I had to hold the probe in the vent for five to 10 minutes. This unit was producing CO over 1500 ppm and, without realizing it, I was inhaling more than I thought. The rest of

the class was standing back and safe.

Climbing back down from the roof when finished, I found myself getting quite nauseated and made a small mess in their parking lot.

I did get over it very quickly and finished the class.

Who would have thought that using a personal CO monitor on a roof would be necessary?

The meter I had used previously was back at the factory getting repaired, but I was on a roof. This was a military base where five people died from CO poisonings, but not from this building.

DANGER, WILL ROBINSON!!

CO poisonings, explosions, fires, electrical shocks, and so on, are all things that must not be ignored on the job.

Today we have excellent tools at our disposal to help warn us of these dangers well in advance of it becoming harmful to us and others – much like the Robot in *Lost in Space* did for the Robinson family.

Safety is always the first concern. That is why it is extremely important to be aware of the surroundings in our working environment. 



Jim Davis is the senior instructor for National Comfort Institute (NCI). He has a long and storied career in the HVAC Industry that began in 1971. Today he is considered one of the HVAC Industry's foremost experts in combustion and carbon monoxide safety. Jim is credited for developing the first combustion testing protocols and field diagnostic methodologies using digital combustion analyzers.



“A Real Death Trap (no pun intended)”

— Heidi Clifton, Austin Energy, Austin, TX

When it comes to the “Bad” category, this is right up there among the worse. Our winner this month only had two words to describe it: “Expensive Vent.”

Heidi Clifton from Austin Energy is the August 2020 winner of our Photo-of-the-Month contest, as voted on by the subscribers to **High-Performance HVAC Today** magazine and visitors to the website (HVACToday.com). She will receive a \$25 gift card.

You can too – submissions are always welcome. If you'd like to submit a photo for consideration in our Photo-of-the-Month contest, go to ncilink.com/POMSubmit and fill out the information as requested.

THE SEPTEMBER CONTEST OPENS ON AUGUST 10, 2020.

That gives you plenty of time to submit something in any of our three categories: **The Good, The Bad, and the WTH (What the heck).**

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NCI Welcomes It's Newest Member Rewards Partner

Welcome to Trinity Warranty Services! Trinity, located in Lombard, IL., is an Extended Service Agreement (ESA) firm. They join the National Comfort Institute family of preferred partners this month.



Trinity offers HVAC contractors residential and commercial programs to help you protect your customers' comfort systems investments.

The Trinity Extended Service Agreement (ESA) is for new residential equipment with either a five-year or 10-year parts and labor coverage. The commercial new equipment ESA provides five or 10-year parts and labor. The company also offers existing equipment coverage on a case-by-case basis based on it being certified to be in factory-like condition.

Their ESA programs cover most all manufacturer brands of equipment and allow you to pick the level of coverage and reimbursement rate that best suits your company. Plus it offers easy online administration, 100% coverage (no deductibles), and more.

As a National Comfort Institute member, you get **6% back** on purchases in the form of NCI bucks through the TIPP (Training Incentive Partnership Program).

You can use NCI Bucks to pay for any **live NCI training class** (ncilink.com/LiveTraining), **online training** (ncilink.com/OLTraining), or **conference** (ncilink.com/Conference).

By the way, NCI training bucks never expire. They carry over from year-to-year

with no penalties or loss in value. As a member, NCI Bucks can reduce or even eliminate your training costs and are a key benefit of your membership.

Click here (ncilink.com/bucks) to learn more about NCI Bucks.

Visit **Trinity's Partner Page** to learn more about them. Go to ncilink.com/Trinity (you need to be logged into the NCI website).

Be Sure to Get Your August PowerPack!!



We hope you were able to take advantage of all the great tools from your July PowerPack.

This month we are focusing on field measuring tips and tools. These include the following:

- **System Temperature Measurement Basics (Online Training)**
- **Enthalpy Chart (Download)**
- **CoolMaxx Report and Procedure (Download)**
- **Measuring Wet Bulb Temperature Tech Tip (Download).**

We think you'll find these tools and training materials very helpful as you continue to grow your High-Performance HVAC business.

Be sure to share your August PowerPack with your entire team! So get started today. Click here to log into the August Power Pack: ncilink.com/PwrPak.

Virtual HVAC Summit: Registration Opening Soon!

With all the challenges the nation faces because of the pandemic, especially regarding travel, social distancing, and the recent surge of infections, National Comfort Institute (NCI) has decided



to make the **2020 High-Performance HVAC Summit** a virtual live event. It will take place online October 5th - 7th. You and your whole team will be able to attend via the safety and comfort of your homes or offices.

Though the event is still being "assembled," just about every feature of the regular in-person Summit that you have all enjoyed over the years will be "virtualized." This means they will be live online with open interaction between the audience and the presenters, our partners, and each other.

The theme remains centered around **Always Be Coaching** your team to high-performance with sessions all geared to helping you improve how you communicate and coach your team. Other features to look forward to:

- Interactive Panel Discussions
- The Virtual Tradeshow with our Partners
- General Sessions / Breakout Sessions
- NCI Contractor / Individual Awards Presentations

There is more to come! Find the latest info at GotoSummit.com.

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Go to ncilink.com/ContactMe with your comments and questions.

Interested in NCI Membership?
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Buildings Need Your Help!



Dominick Guarino is publisher of *High-Performance HVAC Today* magazine and CEO of National Comfort Institute, Inc. He can be reached at ncilink.com/ContactMe

More than ever, building owners and managers need to make sure that their HVAC systems are helping to keep their buildings healthy and safe.

Many are running scared, frantically looking for ways to safeguard employees, tenants, and customers in this current pandemic. The logical reaction is to seek out devices and products that promise to make building air safer.

The good news is there are many great filtration and air quality control products on the market today. The bad news is when misapplied or improperly installed, these devices can inadvertently make buildings less healthy or safe.

At NCI (National Comfort Institute), we regularly hear horror stories of owners and managers adding Indoor Air Quality (IAQ) devices to their HVAC systems that don't work or make things worse. This can happen because they are installed without a knowledgeable person on their team to carefully weigh the potential adverse effects on the overall building pressure balances and air distribution.

For example, many filtration products are being touted as a panacea to the spread of dirt, germs, and viruses. In a lab these products may perform optimally. But before they are installed on an HVAC system, it's imperative that a properly trained professional studies their impact on system pressures and airflows, as well as building pressures.

Replacing media in a filter bank with more restrictive filter material, for example, can have negative unintended consequences. These issues can be mitigated ahead of time with thoughtful planning and redesign.

The solution might include adding more filter surface area or increasing blower capacity to deliver the right airflow even with the increased filter pressure drop. Of course, there are other factors to consider including higher velocities which could cause moisture blowoff on coils, and/or create heat transfer issues.

While this editorial is not intended to be a technical instruction on redesign, it is a cautionary tale on how changes made to HVAC systems can impact how they operate, and how healthy or safe they are.

RISE TO THE CHALLENGE

While design is important, verification is where the rubber meets the road. Over the years, NCI contractors have reported incorrect readings from some of the most sophisticated sensing systems in high-end buildings – including medical facilities, government facilities, and laboratories.

One common problem is when a control/monitoring system inaccurately reads a pressure differential, velocity, or airflow because a sensor is defective or improperly installed - or it's installed in the wrong location. No sophisticated computerized system is infallible. Verification through direct measurement is the best backup plan. That's why our motto for more than 25 years has been, **"If you don't measure, you're just guessing."**

Who better to verify a system works properly than an NCI-certified Commercial Air Balancing or Commercial System Performance Specialist? Direct measurement and knowing how to interpret readings with confidence are at the core of these certifications.

If you employ NCI or NBC-certified commercial technicians, now is the time to bone up on the latest IAQ standards. Be sure to have them review their certification class manuals and Field Reference Guides, and look for ways to apply their knowledge and skills to this critical area.

Next it's important that you let customers know about your capabilities, and how you can help guide them through the right decision-making process to help keep their buildings healthy and safe. Be sure to market your unique abilities and training. This includes sharing information on your website, social media platforms, etc.

Put together a packet that illustrates the testing services you offer, and how they can help keep facilities safer and healthier during these difficult times and beyond. Remember to use simple language, and focus on what's important to them.

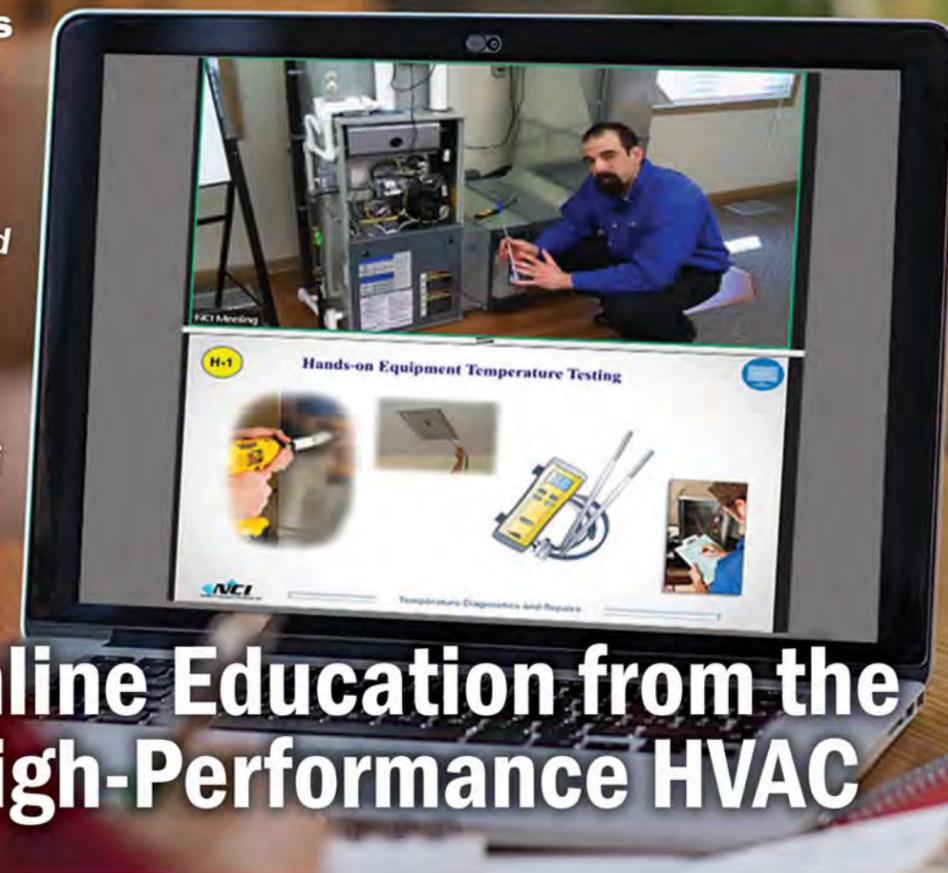
Now is the time to sell your verification capabilities to help both your company and your customers get through these challenging times. 

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