

HIGH-PERFORMANCE HVAC TODAY™

If You Don't Measure, You're Just Guessing!™

HOW YOU CAN Close More Sales with Testing

ALSO IN THIS ISSUE:

Virtual High-Performance Summit
Takes the Industry by Storm

Temperature: The 3rd Step on
the PATH to Airside Performance:
Part 4

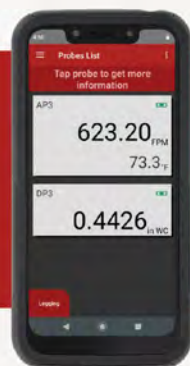
2020 Federal Legislation and
the HVAC Distribution Industry





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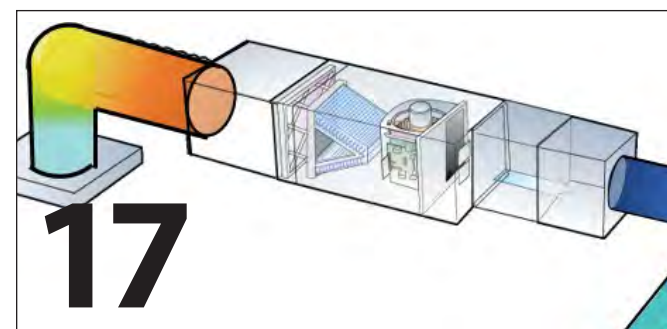
HIGH-PERFORMANCE HVAC TODAY™



MANAGEMENT:

First Virtual Summit Takes HVAC Industry by Storm

Here is a recap of all that took place during the 2020 Virtual High-Performance Summit in October.



TECHNICAL:

Temperature: The 3rd Step on the PATH to Performance, Part 4

This month David Richardson focuses on the 'T' in PATH as he discusses testing and measuring airside performance.

DEPARTMENTS

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SALES:

Use a 'Performance Playbook' to Close More Sales

Dawn Mroczek of GV's Heating shares how she turned her training into useful tools that help her close more sales.



MANAGEMENT:

2020 Legislation and the HVAC Distribution Industry

Alex Ayers from HARDI shares his analysis and insights on several issues affecting distributors and contractors alike.

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The HVAC Industry Mourns the Loss of A Leader



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

I first met Dale Gustavson during an AHR Exposition in the early 1990s while I was a staff editor on *Contracting Business* magazine. I was sitting in on a meeting of energy gurus who gathered to discuss the many issues facing the HVAC Industry at the time. Dale was sitting up front, attentively listening to the conversation, and every once in awhile, in a soft voice, would ask a question or share an idea that dove deep into the topic and often brought side conversations to a standstill.

Later, my publisher introduced Dale to me and he immediately impressed me with his warm smile and friendly personality. He was small in stature but big on knowledge and was more than willing to share everything he knew about the energy industry with anyone who was interested.

Over the years he became more involved with the magazine and when we decided to launch a new publication dedicated to the energy industry, it was no surprise to me that Dale was named its editorial director. He was most likely instrumental in helping to create it. It became a reality in 1997.

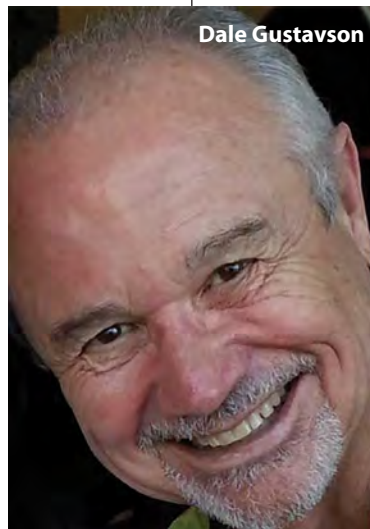
The truth is, this quiet, unassuming man dedicated his entire life to increasing the quality of energy management in the residential and light commercial HVAC markets for more than 30 years. He worked tirelessly to help recruit, train, and equip contractors to be technically competent and quality-driven in their efforts to sell and deliver energy efficiency projects across the country.

Among his many contributions to the industry was his role in helping to establish the Western HVAC Performance Alliance (WHPA). This organization is a group of stakeholders from Cali-

fornia that also included others from around the U.S., dedicated to help California implement its *Long Term Energy Efficiency Strategic Plan*.

I attended the very first meeting in California that led to the formation of this group, as did many other HVAC Industry representatives from trade associations, manufacturers, distributors, and more.

Dale worked tirelessly behind the scenes to help guide those talks which eventually led to the launching of the alliance. He then managed the WHPA and continued to help with project work through his company — Better Buildings, Inc. — from 2009 to 2016.



Dale Gustavson


In an article written by past WHPA Board member and Council of Advisors Chair, Dominick Guarino for *Contracting Business* in 2014 (ncilink.com/WHPA), Dominick said, "Since the WHPA's inception, Dale has had the dogged determination, vision, and stubbornness to make

sure this group would continue to work together and flourish."

He never looked for recognition. He never looked for glory. His mission was to help guide and improve the industry and he always put the work and the people before his own needs. The result has been the betterment of both the energy and HVAC industries.

He was diagnosed with Parkinson's Disease many years ago, yet continued to work and help others throughout the industry.

Dale Gustavson passed away on September 28, 2020. He was 73 years old.

The industry lost a great teacher, thinker, and leader. He will be missed. 

Written By HVAC Professionals for HVAC Professionals

NCI STATIC PRESSURE STICKERS

As an instructor for the National Comfort Institute, I often hear that the reason contractors come to our classes is to set themselves apart from their competition. HVAC contractors are always looking for an "edge" over the other companies they compete against.

What NCI teaches helps them accomplish that by educating their coworkers on how to determine the "High Blood Pressure" of the customer's existing HVAC system.

NCI's trademarked slogan, "If You Don't Measure, You're Just Guessing™" becomes a mantra for the people who attend our classes. When you record static pressure readings, you stay ahead of any deteriorating trends developing in the system.

One of the many supporting materi-

als we offer is the convenience of Static Pressure Stickers (ncilink.com/SPPort).

These self-adhesive "visual" representations of where the HVAC professional installs Static Pressure Test Ports gives the added bonus of the quality of care you provide as a Performance-Based Contractor.

Use these stickers to record up to nine pressure readings with "Date," "Tested By," and "Reading" on a durable white vinyl with a matte laminate applied for writing. It also allows you to mark whether it is Test Port A, B, C or D to be used in conjunction with the Air Upgrade Reports that NCI offers.

These stickers come in shrink-wrapped packs of 100 and include split crack-and-peel backs for easy application. They are only available for those companies cer-

Static Pressure Port		
Test Port: A B C D		
Date	Tested By	Reading

NCI Tested by an NCI Certified Technician
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tified by the National Comfort Institute.

You can also customize these static pressure stickers with your logo, which gives you another "Why you should use me" arrow in the quiver against your competition.

— John Puryear, NCI Instructor

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National Comfort Institute Yesterday, Today, and Tomorrow



The leadership of National Comfort Institute: (left to right) President Rob Falke and Chairman & CEO Dominick Guarino.

This October at our Virtual High-Performance HVAC Summit I shared some history on how the National Comfort Institute (NCI) got started and how it has evolved over the years.

A number of our members and fans asked if I would share this history from my perspective in the pages of this magazine. So without further ado, here is how NCI came into being.

IN THE BEGINNING...

In the early nineties, as Chief Editor of *Contracting Business* magazine, I wrote a number of articles on how our industry had somehow become derailed from its primary mission: It had become mostly focused on selling ever increasing efficiency equipment. This shift began with the energy crisis of the 1970s.

I had been fortunate enough to

have previously worked in a residential contracting business as a salesperson and installation manager. Like everyone else, I had been conditioned to sell the highest possible efficiency equipment. While in the field, this schism between efficiency and comfort became a louder and louder voice in the back of my head. Then one day on a sales call I had my 'Aha' moment. I remember it like it was yesterday.

On a cold and snowy winter day in Cleveland, Ohio in the early 1990s, an elderly couple had me out for an estimate to replace their 30-year-old furnace. As I entered their home, I noticed the living room was very cold. When I asked why they kept it so cold, they told me it was not by choice – it had always been that way since they had the house built, so they avoided using that room in the winter.

We then proceeded to the kitchen, which was very hot and stuffy, and sat down at the kitchen table to talk about replacing their system.

After a quick walk through of the rest of the home, I headed down to the basement to measure the system. I no-

ticed they actually had very well-designed ductwork complete with dampers at all the take-offs. At that time I didn't know much about air balancing, but I decided to try adjusting the dampers to drive more air to the living room, and less to the kitchen and some of the other rooms.

When I went back upstairs I immediately felt a major change in temperatures. I asked the couple to follow me to the living room. They looked at me like I was crazy, asking "Why would we want to go in there?"

They reluctantly followed me in, and I wish I had a camera to capture the shock on their faces when they realized the room had warmed up. "What did you do?" they exclaimed incredulously!

"How were you able to get this room warm when you were only downstairs 15 minutes?"

I explained that I had made some simple adjustments to their duct system to see if I could get it to distribute the heat throughout their home more evenly. They were literally in tears realizing they had needlessly lived this



NCI has grown into an extensive advanced training and membership organization with 30 team members in nine states across the U.S.

way for the past 30 years.

Suffice it to say I won the job. But that incident has stuck with me for more than 30 years now. It was the epiphany that sent me on a quest to understand why our industry had taken its eye off the ball with regards to comfort.

A PIVOTAL MEETING

In 1992 my publisher and mentor, Jeff Forker, who has since passed, mentioned to me that he met a fellow who seemed to be on the same mission I was on. He urged me to go to California to meet this guy who sold for his family HVAC business in Turlock, CA.

It took Jeff a while to convince me, but I finally gave in and called Rob Falke to learn about what he was doing.

Rob was just so excited to share his experiences with this thing called Air Balancing. I think he kept me on the phone for at least an hour. He certainly piqued my curiosity enough that I had to see this for myself.

We made plans to meet up in Sacramento at the home of a gentleman by the name of Gary Klein, who happened to work for the California Energy Commission at the time.

Once he started pulling out the pressure and airflow measurement tools, it was all over. I was hooked. We spent the morning testing and balanc-

ing Gary's system, went out to lunch for Thai food, all the while talking non-stop about how the industry just missed it. We talked all afternoon and into the wee hours. Somehow I made my early morning flight the next day.

Over the next few years Rob and I continued to communicate about this approach to balancing and delivering comfort. He wrote articles for the magazine, becoming a regular contributor for many years.

NCI IS BORN!

Soon after, Rob and I met in person again at an industry conference where he was presenting on Residential Air Balancing. He mesmerized the room with his passionate message on how we can make homes more comfortable.

After the conference we left for the Dallas airport together and sat at our gate sketching out this crazy idea to teach what we had been learning over the previous years. We shook on it and NCI was born.

Over the next few years the fledgling company consisted of Rob and I working part-time while still holding down our real jobs as a magazine editor and salesman/air balancer. Together we wrote the first NCI manuals. I focused primarily on marketing and selling classes as Rob flew around the country teaching them.

THE NEXT PHASE

By 1998 NCI became a full-time mission for both of us. We quit our day jobs and started to grow and add staff, including new instructors. We had one important rule with regards to new trainers: they had to have actually done what we teach in the field before they could teach for NCI.

Around the turn of the century we also realized that there was more to it than balancing comfort. As we dove into the engineering and conducted extensive field testing, we learned that comfort and energy efficiency didn't have to be mutually exclusive. In fact, all of our testing and evaluations (what later evolved into 'Performance') led us to conclude that high-performance testing should be all encompassing.

We conclusively established that when you properly design, install, test, and balance a system you can make a home or building safe, healthy, comfortable, and energy efficient. Plus, we can do this without compromising any one of these parameters.

The key is measurement. There is no way around it. You have to measure to verify performance. This is why nearly 20 years ago NCI's motto became "If You Don't Measure, You're Just Guessing™."

In 1999 we expanded beyond airside training to teaching combustion and





NCI training centers in Southern California (above) and Northeast Ohio (below).



carbon monoxide safety with the help of Jim Davis, one of the world's top experts in this area.

In 2000, we launched a membership organization of like-minded contractors, and continued to add new classes as we improved our existing training year after year.

In its first 10 years, NCI nearly doubled in size almost every year. It has since grown into an organization with training centers in Northeast Ohio and Southern California with 30 employees. We also regularly work with more than 50 HVAC distributor locations around the country who host our classes.

Over the past 26 years NCI has trained more than 30,000 industry professionals in 7,000 plus companies

across North America and around the world. We continue to train around 2,000 professionals a year from HVAC contractors to government groups, facilities management companies, college campuses, and military bases. We also conduct 40-50 classes a year on behalf of several of the country's largest utilities.

A NEW CHAPTER

This past spring NCI entered a new phase of its journey, not exactly by choice, but because the COVID-19 Pandemic virtually shut down in-person training. While we've had a robust Online University with self-directed classes for many years, in April 2020 we made the leap to live, online training.

Since then we've created eight new

IT'S NOT TOO LATE TO ACCESS ALL RECORDED SUMMIT SESSIONS AND VIRTUAL TRADE SHOW, WHICH WILL BE ONLINE THROUGH JANUARY 2021. FOR MORE INFO POINT YOUR BROWSER TO WWW.GOTOSUMMIT.COM



Online Live classes and broadcasted 60+ virtual events for more than 1500 students! This September we broke another barrier and launched two new online NCI Certification classes with proctored online exams.

It all happened so fast it's hard to remember how we pulled it off. And we are adding two to three new certification classes by the end of 2020!

This past October, in less than 60 days, we designed and launched our first virtual High-Performance HVAC Summit. Early feedback indicates the event was very successful for all involved, including attendees and our

partners, who had booths in our first ever virtual tradeshow.

WHAT'S NEXT?

We will be premiering some amazing new programs and products this fall and winter – some of which have been two years or more in the making. While virtual training has been pretty successful, nothing beats face-to-face training and hands-on learning. We plan to restart in-person training at our centers and distributor/partner locations across the country as soon as it's safe to re-open.

As things get back to normal, NCI

will continue to offer both in-person and live online High-Performance training to HVAC professionals. Barring any unforeseen events, we plan to hold Summit 2021 in person in early September — stay tuned!

We are so grateful and humbled that thousands of contractors and HVAC professionals continue to come to NCI for knowledge and training. Both Rob and I have seen our wildest hopes and dreams materialize and continue to evolve as we serve this wonderful industry which has given so much back to us. Thank you. The best is still yet to come! NCI

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Old Way of Hanging Flex



Increases Efficiency

Complies with UL2043

Reduce Labor Costs



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Another Summit event is in the books, only this one was so very different from all the rest. Because of the COVID-19 Pandemic, Summit could not be held as an in-person event and so, was converted into a live online event in very short order.

It is safe to say that despite having to do this virtually, Summit 2020 actually attracted more HVAC contractors than any previous Summit and, despite some technical glitches, the interaction between speakers and attendees was superb.

More than 230 HVAC contractors from across the country got together online from October 5-7 to learn how to coach their teams to success.

BREAKOUT SESSIONS

This year's theme was "Coach Your Team to High Performance." From the opening session through every workshop, attendees learned how to coach all their team members.

The breakouts were as follows:

Session 1: Coach Your Entire Team: NCI's David Richardson presented how contractors can coach their teams on what High-Performance contracting is and why the company should be on that path.

He focused on how attendees can use data from performance testing to not only help contractors differentiate by delivering the best possible products and services, but also to help employees understand

how important that is.

Session 2: Coach Your Managers: Contractor David DeRose of Masterworks Mechanical, Craig, CO presented attendees how, after the team knows the performance mission, to coach other managers on some of the subtle changes necessary to integrate higher performance into the company.

Session 3: Coach Your Technical Team: NCI Instructor Casey Contreras presented the field perspective on integrating performance testing into service and installation technicians' daily work. He shared the importance of how to support the technicians during the transition to High Performance and also coach them on the processes necessary for success.

Performance Town 2020: Hands-on Demonstrations: NCI's Performance Town returned to Summit this year. Three workshops lead by NCI's Rob Falke, Jeff Sturgeon, David Richardson, Casey Contreras, Scott Fielder, and Justin Bright provided contractors with insights on how to conduct testing and calculations in the field.

The Performance Town workshops also detailed how to diagnose issues and offer customers choices on profitable system upgrades.

All attendees to these workshops received NCI's new detailed procedures and quick reports to use with attendee's management teams coaching.

Session 4: Coach Your Sales Team: The final step is integrating a High-Performance sales



NCI's 16th Annual Contractor Recognition Program

In NCI's Annual Awards Presentation, member companies are recognized for various achievements during the year.

CONTRACTOR OF THE YEAR AWARDS

This year's winners include:

- **Small Contractor of the Year** – *Under \$2 million in sales:*
Four Seasons Air Conditioning and Heating, Kingsville, TX
- **Medium Contractor of the Year** – *\$2 to \$6 million in sales:*
Kennihan Plumbing, Heating, and Air Conditioning, Valencia, PA
- **Large Contractor of the Year** – *More than \$6 million in sales:*
Jansen's Heating and Air, Effingham, IL.

OTHER ACHIEVEMENTS

Furthermore, NCI recognized several individuals for outstanding achievement. Award recognition went to:

- **John Garofalo Implementation Excellence Award:**
All Pro Plumbing, Heating, Air, & Electrical, Ontario, CA
- **David Debien Award:** Vic Updike, **Masterworks Mechanical**, Craig, CO
- **Scott Johnson Training Excellence Award:**
Getzschman Heating, Fremont, NE
- **Sales Excellence Award:** Dawn Mroczek, **GV's Heating and Cooling**, Glenview, IL
- **Preferred Partner Award:** **R.E. Michel, Inc.**, Glen Burnie, MD
- **Chairman's Award:** Ronald Amaya of **Punbar LLC**, Houston, TX.

approach with your sales team. NCI's David Holt led this session and he discussed how to coach both inside and outside salespeople on the specifics of adding air upgrades and renovations to their proposals.

This includes the practice of knowing when to price the work themselves and when to bring in higher-level technical expertise.

NCI PARTNERS TRADE SHOW

For the first time, attendees experienced a virtual tradeshow where they visited booths, attended one-on-one and group meetings online, then downloaded brochures, catalogs, and more. Booths were "manned" by the exhibitors who had plenty of "face-time" with attendees.

PANEL DISCUSSION

In addition to the sessions and workshops, this jam-packed Summit also included a number of special events including a contractor panel discussion moderated by Dominick Guarino.

The topic: how the COVID-19 Pandemic impacted their business and what they did and are currently doing to meet those challenges.

Panelists included:

- Dawn Mroczek, Comfort Consultant, GV's Heating, Glenview, IL
- Dave DeRose, Founder, Masterworks Mechanical, Craig, CO
- Dan Squires, President, Vincent's Heating, Port Huron, MI
- Michael Greany, Service Manager, All Pro Plumbing, Ontario, CA

- Greg Wallace, Owner, Progressive Heating, Newnan, GA.

This highly interactive discussion was one of the highlights of the three-day virtual event.

IDEA MEETING

The Annual Idea Meeting has been a popular Summit event from very early in its history. This is where contractors gather to share their ideas on how to creatively build lead generation and sales into their companies. Once the ideas were presented, all the session attendees voted on the best idea in each of the two categories.

The 2020 winners were:

Lead Generation: Ronald Amaya of Punbar LLC in Houston, Texas. His idea was to better serve his multi-

cultural customer-base by developing bilingual websites with Spanish and English options.

Sales: Will Horner of Canco Climate Care in Ontario, Canada. Will's winning idea was to provide homeowners with "Birth Certificates" for their new or renovated HVAC systems, then use those to help close sales with other customers.

Both ideas earned the winners \$310 in cash.

And finally, NCI Chairman and CEO Dominick Guarino announced that the **2021 High-Performance Summit** will be held in-person in Branson, MO as long as the Pandemic is under control at the time.

Stay tuned for more information as we get it. NCI



Use A “Performance Playbook” To Close More Sales

When clients ask about who is coming to their home to provide a free estimate, they seem to always think its “Don.” When I arrive, they are a bit surprised that I’m a woman and my correct name is Dawn.

Being in a male-driven industry requires quite a bit of hard work and self-confidence. I first started as a Comfort Specialist in 2006, and GV’s Heating and Cooling was just like all the other HVAC companies in our market area; we sold boxes.

Then we decided things needed to change.

We needed to find the true value as to why clients choose GV’s to do the work. So, in 2010 GV’s joined National Comfort Institute (NCI), and we started implementing static pressure and temperature testing on every sales call.

QUESTIONING EVERYTHING

In 2018 I attended NCI’s Commercial Air Balancing and Duct Renovation classes. That experience opened my eyes to the fact that we were not closing many duct renovation jobs. So it was time to re-evaluate our sales process.

I asked the following questions: How do clients know exactly what measurements we took? And why? How are they supposed to remember all the information we present to them during the house

call? We say we are certified in Air Diagnostics and Air Balancing, but we don’t show them any proof!

Furthermore, since they don’t follow us around the house, how will they know what we find? All these questions led me to a new way of presenting all the test data we gather into a “Performance Report,” along with a **ComfortMaxx™** (ncilink.com/CM maxx) summary, and proposal.

So, what is a “Performance Report?” After referring back to our NCI class materials, we decided to start creating some forms including the following:

- Cover page (Air Balance Report Certification)
- Certification Certificates
- Notes and Remarks
- Test and Balance Deficiency Report – with Corresponding Pictures
- Test In – ComfortMaxx
- Proposal.

If you would like to see a sample of our playbook, go to ncilink.com/Playbook.

COVER PAGE

The cover page really is the “Air Balance Report Certification” page that comes with NCI’s Commercial Air Balance class.

This page includes:

- Date
- Project name
- Which system – 1st Floor / 2nd Floor etc.
- Technician name
- HVAC contractor information



The “Playbook” always includes the technician’s certifications to build credibility with the customer.

- A summary
- NCI certified # / Expiration date.

Following the cover page, we include the certificates we earned from NCI.

NOTES AND REMARKS


This is one of the most important pages in the report. Notes and Remarks contains a list of all the issues found for each part of the whole-house comfort system:

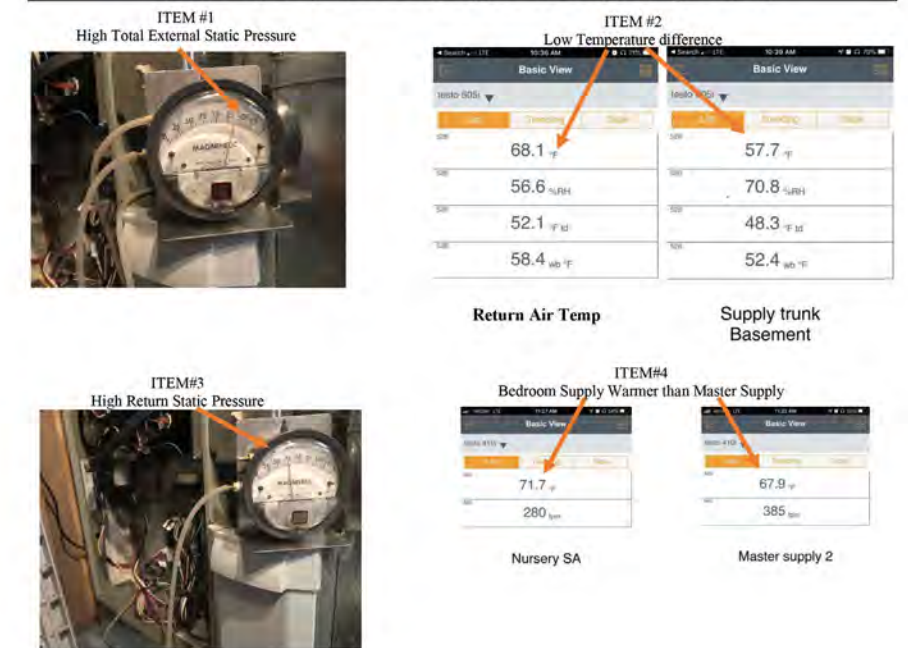
1. High Static Pressure
2. Low or high-temperature drops
3. Restrictive filter
4. Dirty filter
5. Blower speed set wrong
6. Restrictive fitting
7. Undersized ductwork
8. Dirty blower
9. Melted rings on the water heater.

Also included in the Notes and Remarks area is a checkbox denoting whether the issue remains open or is closed after the visit.

And finally, we include a section for Contractor Remarks. Typically, this is where we share the data we collected:

- **What was the TESP:** Measured TESP vs Manufacturer-rated TESP
- **Temperature Drop:** Measured temperature drop vs manufacturer-rated temperature drop
- **Restrictive Filter:** Pressure drop of filter vs Standard filter drop
- **Dirty Filter:** Pressure drop
- **Blower Speed Set Wrong:** 400 CFM (Buckets of air/ton) have 3.0-ton blower speed, but it’s set to 4.0 tons
- **Restrictive Fitting:** Measured pressure of return or supply
- **Undersized Duct:** We get this data from the NCI Clipboard based on actual duct size compared to the amount of CFM needed for that specific system

	Project:	Blanchard Residence			
	Location:	3035 Thayer, Evanston			
	HVAC Contractor:	GV's Heating & Cooling, INC			
	Certified Number:	17-351-07 / 19-267-06			
Test and Balance Deficiency Report - Corresponding Pictures					



This page from the GV’s Performance Playbook shows the TAB Deficiency Report.

- **Dirty Blower:** A dirty blower wheel decreases the system efficiency
- **Melted Rings:** The water heater may not be venting properly – combustion analysis must be done for safety concerns.

Under each item listed above, we have a corresponding picture number.

TAB DEFICIENCY REPORT — CORRESPONDING PICTURES

In this portion of our report, we include all the pictures that correspond to the Notes and Remarks page. We are very specific with the pictures we provide.

- **High TESP:** From taking a picture of the Magnehelic with the TESP, compared to the rated TESP on the furnace nameplate
- **Low- or High-Temperature Drop:** Take a picture of the psychrometer with measured temperatures vs Manufacturer’s heat specs

on the furnace nameplate

- **Restrictive Filter:** Take a picture of the filter
- **Dirty Filter:** Take a picture of the filter
- **Blower Speed:** Take a picture of wiring or dip switches on circuit board
- **Restricted Fitting:** Take a picture of fittings
- **Undersized Duct:** Take a picture of supply trunk(s) and/or return trunk(s)
- **Dirty Blower:** When the furnace is off, reach into the blower compartment and take a picture of the blower wheel
- **Melted Rings:** Take a picture of melted rings around hot and cold water on the water heater.

PLAYBOOK

- ▲ The performance report helps create a playbook for our installation crew:
- ▲ The playbook provides a thorough

This is the “Playbook” cover page which is very much like NCI’s Air Balance Report Certification page.

outline of the changes we plan to make at a client's home to improve the system's comfort and efficiency

▲ Makes it easier to hand off the job from sales to the installation crew

▲ The playbook is attached to each job in ServiceTitan.

COMFORTMAXX™

For any sales call scheduled for a furnace/air conditioner replacement, or a client suffering from hot and cold spots, we provide a ComfortMaxx™ Test-in Report (hvactoday.com/comfortmaxx).

This is a great way to show a client how their existing system is actually performing from a third-party application. The report provides a great breakdown of where the system has high pressure based on our data:

1. Supply
2. Return
3. Filter Pressure Drop
4. Coil Pressure Drop.

The report is a great visual aid with a gauge. It backs up the information you provided in the Performance Report.

PROPOSAL

In the proposal, we include all the recommendations from the Performance Report. We find that since we started this process, most of the time the customer goes with the best option, and no longer does things in stages.

EXAMPLE: THE BLANCHARD RESIDENCE

One of our team's biggest accomplishments was improving the comfort and efficiency of a newly renovated house. The Blanchard's just bought the home from a builder. They complained to us that the second floor was

significantly hotter than the first floor in the summer.

When Mr. Blanchard walked me throughout the house, I experienced it myself.

Turning the thermostat to cooling mode, I proceeded with my favorite part of any call — collecting the data. I measured static pressure, temperatures, and airflow. I checked out the duct sizes blower speeds. Then I captured the information from the furnace and air conditioner nameplates.

When Mr. Blanchard reached out to schedule the job, he asked me if zoning would work. He mentioned to me that he received another quote and the other company recommended adding zoning.

I explained to Mr. Blanchard that he didn't have ductwork dedicated to the first and second floor, plus with the measured high TESP, zoning would put a lot more pressure on the system.

The existing furnace and air conditioner installed in this home are about a year old. It is a variable-speed furnace, paired with a single-stage air conditioner.

This particular brand of furnace cannot have a media filter cabinet con-

nected to its side. It has about 8-in. of wasted space in the front where the air cannot be brought into the blower compartment.

I measured the following pressures:

- .74-in. w.c. return pressure
- .66 supply pressure.

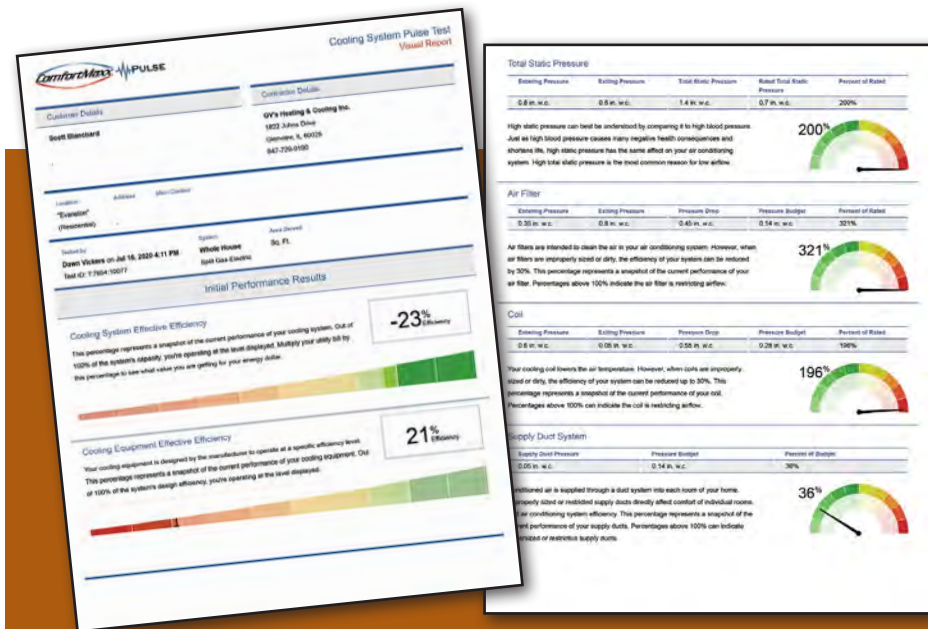
The supply and return ducts are undersized based on the amount of CFM needed for the system to run efficiently. So, we removed one of the ducts from one of the main supply trunks and brought it back to the supply plenum.

We also brought back a return to the return drop to bring more air into the furnace. We increased the return air-drop and installed the filter in the horizontal position.

After completing all the ductwork renovations and balancing the system, we retested it and found we had reduced the system to .70 TESP. This was exactly to the manufacturer's specs! We hadn't even finished the job on day one and the customer stated the next day that he already noticed a huge difference in comfort.

REVIEW

Professional, Punctuality, Quality, and Responsiveness are just some of



The ComfortMaxx™ Report is a great way to show customers how their systems are actually performing from a third-party application.

the words that Mr. Blanchard used to describe his experience with our company. After we completed the Blanchard job, we received the following raving review:

"I really enjoyed working with this company. From beginning to end, GV's excelled. We had issues with airflow in our home and the upstairs was significantly warmer than downstairs.

"They provided a free estimate and discussed the recommended ductwork with me at length. The installation was painless and thorough. They tested airflow at all parts of our home and made adjustments until everyone was satisfied.


"They made various fixes along the way to optimize our furnace, like adjusting the blower speed to match our

home's needs. Everyone I worked with was knowledgeable and professional.

"The way they worked with me made me feel like they truly cared about their work and making sure the air was right and that I had a good experience. Fair warning, they are not cheap, but it has been well worth the money."

WHERE WE ARE HEADED

GV's is never satisfied with where we are. We always strive for new ideas to avoid obstacles that may come our way. The COVID-19 pandemic did not stop us much. We worked harder and are currently financially ahead of last year. This also helped us regain our focus on our core values: Humble, Honesty, Integrity, and Hungry.

We strive as a team to bring GV's to the next level and become "The Performance Contractor" in the Chicagoland area! If it wasn't for the NCI Performance Coaches and the monthly Trailblazer team, we would not be where we are today. 



Dawn Mroczek is the comfort specialist at GV's Heating & Cooling in Glenview, IL. In 2007 she moved into the sales position. She is certified in Commercial Air Balancing, Duct System Optimization, and was recognized as one of the "Wonderful Women in HVAC Sales" with Sharon Roberts. She is also the 2020 recipient of **NCI's High-Performance Sales Excellence Award** that was presented to her at this year's Virtual Summit. If you would like to learn more about her Performance Report, reach out to her at ncilink.com/ContactMe.



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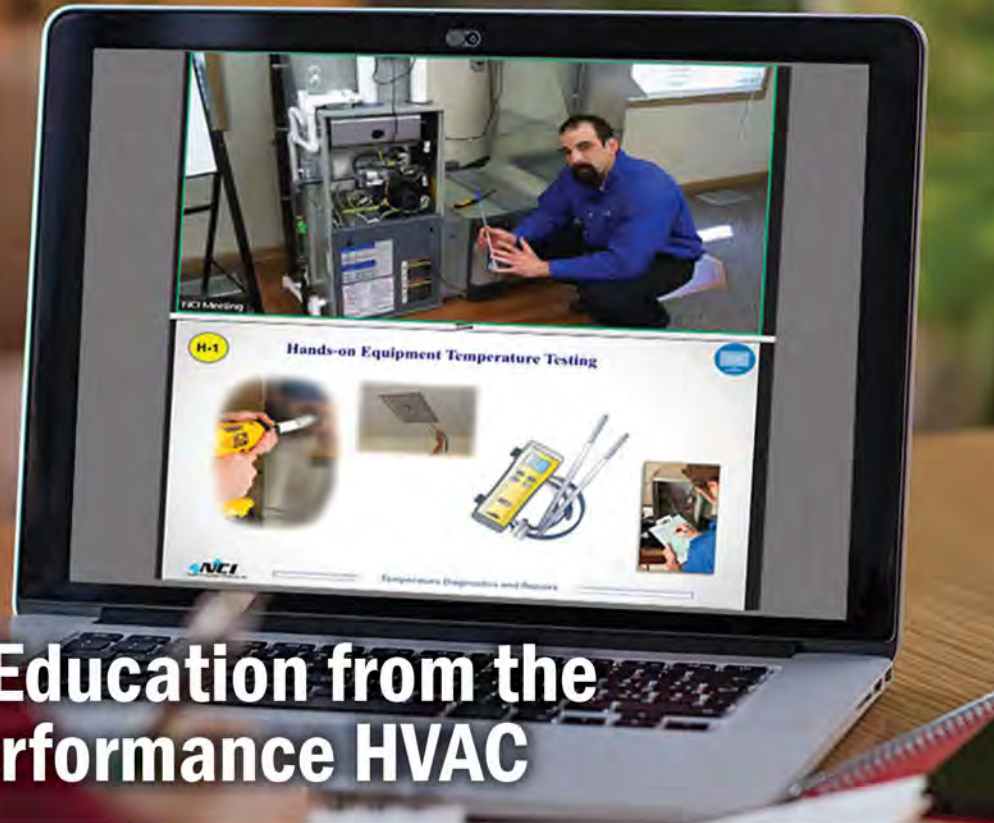
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TECHNICAL

By David Richardson

The PATH to Performance: PART 4

Temperature: The Third Step to Airside Performance

Temperature is the third step on the path to performance. Since many are already familiar with temperature measurement, the path to performance gets easier at this step. However, many of us limit our temperature testing to the equipment and fail to see its impact on the rest of the system.

As you move along the path to performance, you've already mastered the concepts of static pressure and airflow. Now it's time to consider temperature at the supply registers and return grilles. These temperature measurements often reveal a significant negative impact on the comfort of your customers which is critical to your system performance diagnostics.

Once you release the true potential of temperature testing, you'll quickly discover why oversized systems appear to work well, while properly sized systems often cannot provide comfort.

TEMPERATURE PRINCIPLES

It's helpful to review some temperature basics before we discuss how it ties into the performance path. First, hotter temperatures always move towards cooler temperatures, or hot goes to cold. Second, hotter air rises while colder air falls.

For those of you who've attended National Comfort Institute's (NCI) **Carbon Monoxide (CO) and Combustion Performance** course (ncilink.com/COtest), you've seen how we tie these principles into draft pressure and stack effect.

When you measure HVAC temperatures, you typically use two temperature types: dry bulb and wet bulb. Dry bulb temperature measurements help interpret the amount of heat in the air. It typically refers to the temperature you can feel such as

when a gas furnace kicks on and warms up the air. Use this temperature when testing heating and cooling systems.

You should use wet bulb temperature for cooling system testing. This reading accounts for both heat and moisture content in the air.

We rarely do much with wet bulb as a single temperature reading. Instead, we use it in combination with other measurements, like dry bulb temperature, to determine other air properties such as relative humidity.

Then there is something called dew point temperature. This is a third measurement that helps us understand at what temperature moisture in the air condenses on a surface.

For example, let's consider an uninsulated metal duct system in a crawlspace. As the cooling system runs on a humid summer day, the ducts sweat. The duct temperature is lower than the dew point temperature, so condensate forms. As soon as your back brushes against those ducts, you're soaked.

THIS IS THE FOURTH IN A SERIES OF ARTICLES BY DAVID RICHARDSON DISCUSSING THE PATH TO PERFORMANCE: PRESSURE, AIRFLOW, TEMPERATURE, AND HEAT.

The PATH to Performance: A Six-Part Series

We continue with our series of articles detailing the **PATH** (Pressure, Airflow, Temperature, and Heat) to Performance. In the first three installments, David Richardson provided an overview of PATH, detailed Step 1: Pressure, and covered Step 2: Airflow.

- Read Part 1 here: ncilink.com/PATH1 (Overview)
- Read Part 2 here: ncilink.com/PATH2 (Step 1: Pressure)
- Read Part 3 here: ncilink.com/PATH3 (Step 2: Airflow).

Remember, practice makes perfect. So, as 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.

In his next article, Richardson will address more details on the third step in the PATH: **Heat**. Stay tuned!

To find out more: Call 800-633-7058 or visit ncilink.com/DistLearn

TEST INSTRUMENTS

Before you can measure temperature, you need quality digital test instruments capable of measuring to a tenth of a degree (.10°F) inside the duct system. These instruments include:

- **Digital Thermometer** – for gathering heating and cooling dry bulb temperature readings
- **Digital Psychrometer** – for measuring cooling system temperatures such as dry bulb, wet bulb, and dew point. Additional air properties such as enthalpy and relative humidity are also available.

NOTE: Keep fresh batteries handy for your test instruments. Many digital temperature instruments lose accuracy when the battery charge is low. Reaction time is also important with any thermometer. They should adjust quickly to changing temperatures. If your thermometer or psychrometer is older and slower, consider investing in a newer model.

EQUIPMENT TEMPERATURE MEASUREMENTS

Your physician compares your temperature reading to a known standard to see where it compares. A healthy person should run a temperature of 98.6°F. If the measured temperature is out of range, it's an indicator that something could be wrong and further investigation is necessary.

Just as a medical professional has an acceptable test location and baseline to compare their readings, so should we as we follow a similar pattern with temperature testing. We need to test in the right locations and then compare our temperature measurements to known standards to see where we fall. Only then should we decide if we

need to take further actions.

The first step with equipment temperature testing is to assure your test locations are acceptable. A simple rule to follow is to place your test ports where the thermometer probe cannot "see" the heat exchanger or evaporator coil. It's also a good idea to avoid testing near any duct leaks or the blower motor. NCI recommends you test equipment supply temperatures in a branch duct close to the plenum.

As you measure and interpret equipment temperature changes, keep in mind it is always affected by the volume of airflow moving through the equipment.

If airflow is lower than specified, temperature change will be high. If airflow is high, temperature change will be low. Remember, "A" is before "T" in PATH. This is another reason why you should check airflow before you jump to temperature measurement.

When you measure equipment temperatures, begin with the dry bulb temperature difference or Delta T (Δt) between the air entering and exiting the equipment. Compare your readings to the specified Δt for the equipment you're working on. Gas furnace Δt is the easiest to find. The nameplate inside the furnace provides the temperature rise range.

Air source equipment, like heat pumps and straight cooling systems, have a varying Δt based on various conditions. Heat pump heating Δt ranges are usually between 10° to 35° depending on the outdoor air temperature. The warmer the outdoor temperature, the higher the Δt .

Cooling system Δt ranges are typically between 16° to 24°. Factors affecting

this range are airflow across the coil, indoor dry bulb temperature, indoor humidity, and outdoor air temperature.

If your airflow is within $\pm 10\%$ of manufacturer specifications and the equipment Δt is within range, chances are high the equipment is operating as designed.

However, just because the equipment airflow and temperatures are in range, it doesn't mean the system will maintain comfortable conditions. This is where system temperatures can help you see through a fresh set of lenses to identify hidden defects.

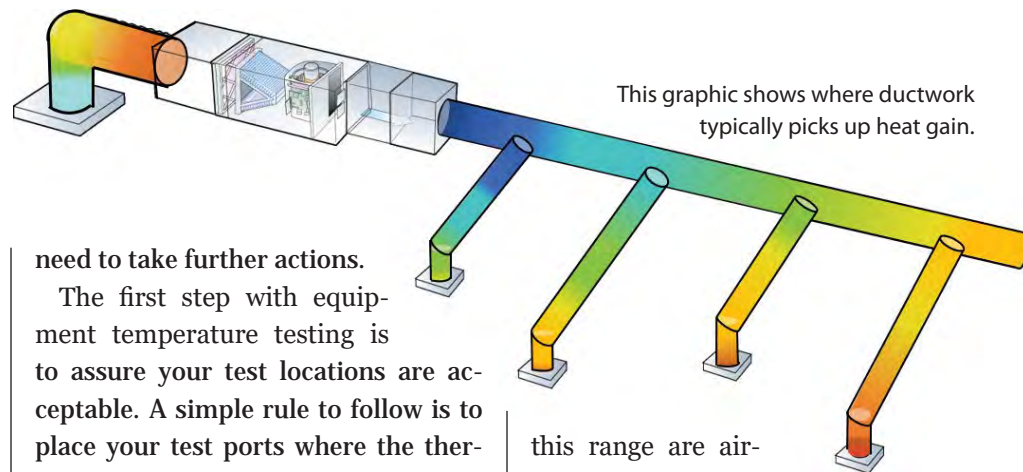
SYSTEM TEMPERATURE MEASUREMENTS

When your temperature measurement locations move beyond the equipment to the registers and grilles, you start to understand how duct system insulation influences performance. This test allows you to see the Δt your customer experiences in their home or office. Unfortunately, it is usually nowhere near the same as the equipment Δt .

In an ideal world, the equipment Δt and system Δt would be the same. However, we put duct systems in some rough locations. They are subject to extreme temperatures that change the conditioned air temperatures through them.

To account for these conditions, you can measure system temperatures at these common test locations:

- The temperature in the farthest supply register and return grille to determine worst-case system Δt



- The average of three supply register temperatures and two return grille temperatures to determine average system Δt (we'll discuss this concept more in the next article)

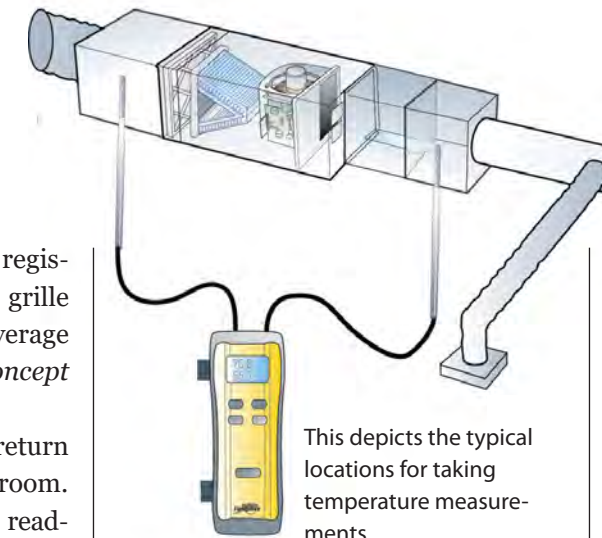
- At the supply register and return grille of the most uncomfortable room.

For your system temperature readings to make sense, you'll need a standard to compare them against. You could aim to duplicate the equipment Δt , but you will find yourself disappointed that you rarely hit that target. A more reasonable goal for a well-insulated duct system should be less than 10% loss of the equipment's Δt . That might sound like a lot until you see how hard it is to come in under that target. Here's how you can figure it out for yourself.

DIAGNOSE SYSTEM TEMPERATURE READINGS

Let's say you have a duct system installed in an attic. It is common in many parts of the country for attic temperatures to reach 130° to 140°F in extreme summer conditions. Combine that with ducts in the same attic space carrying 55°F conditioned air, and you have a recipe for an uncomfortable building. That's a 75° to 85°F Δt (temperature difference)! Ceiling insulation is often R-38 while duct insulation maxes out at R-8. There's a problem with this thinking.

You can use system temperatures to measure duct temperature gains. All you need are four temperature readings. Make sure the equipment has been running for at least 10 minutes before testing. Start at the air handling equipment and measure supply and return air temperature to determine equipment Δt . Next, measure the farthest supply register and return grille air temperatures to determine



the worst-case system Δt .

First, in cooling mode, **find the equipment temperature drop**. Subtract the equipment entering air temperature from the equipment exiting air temperature.

Next, **calculate your supply duct temperature gain**. Subtract the equipment exiting air temperature from the farthest supply register air temperature.

Then, **find your return duct temperature gain**. Subtract the farthest return grille air temperature from the equipment entering air temperature.

Finally, add together your supply and return duct temperature gains to **find total system duct gain**.

For example, let's say you measure a cooling system with a 20° Δt across the equipment and a 10° Δt across the duct system. That would be a 50% duct gain ($10^\circ \div 20^\circ = 50\%$)! If your equipment is rated at four tons, it would be the equivalent of a two-ton unit because of that duct temperature gain. You won't see this unless you measure system temperatures and equipment temperatures.

In heating mode, the principles are the same, but the temperature locations in these formulas flip flop.

The most applicable repairs for duct temperature gain are to add duct insulation and seal duct leakage. Be careful as you choose from various insulation

options available. Some insulation types offer exaggerated promises but don't perform in the field.

OBSTACLES IN THE PATH

As you move further along the Performance PATH, the obstacles you met with pressure and airflow are the biggest to overcome. If you've come this far, it's all downhill from here. Two of the most common obstacles you will find with temperature are:

- Testing too close to a heat exchanger or cooling coil
- Taking too much time between your temperature readings.

Both issues can cause your temperature readings to make no sense or look like the equipment and/or the system is operating better than they are.

Pay attention to these easy-to-correct obstacles.

OUR LAST STEP

Heat is the last step on the performance path. It is the combination of temperature and airflow and the true measurement of installed HVAC system performance.

In the next article, we'll look at what this step has to offer you and how it moves our industry beyond selling boxes to providing solutions. 



David Richardson serves the HVAC industry as a curriculum developer and trainer for National Comfort Institute, Inc. (NCI).

If you're an HVAC contractor or technician interested in learning more about airtight

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.

2020 Legislation and the HVAC Distribution Industry

COVID-19 has impacted virtually every sector of the economy through changes in consumer spending, a global recession, and in some states, full economic lockdowns.

Add in an election year full of presidential politics, the unexpected passing of a Supreme Court Justice, plus a divided Congress, and it is easy to see why the federal government hasn't moved forward with important issues to the HVACR industry such as the phasedown of HFC refrigerants.

But the industry is still hopeful for a resolution this year.

More than 100 nations have agreed to phase down the production of hydrofluorocarbon (HFC) products, including many common air-condition-

ants the industry has asked Congress to authorize the U.S. Environmental Protection Agency (EPA) to write new regulations allowing for the phase down. On October 30, 2019, Senator John Kennedy introduced the **American Innovation and Manufacturing Act** (AIM Act), S. 2754, to phase down the production and use of HFC products, including refrigerants, through 2036.

The legislation is supported by trade associations representing producers, manufacturers, distributors, and contractors across the HVACR industry. This broad support highlights the important role a structured phasedown plays in ensuring an orderly transition to the next generation of refrigerants.

The AIM Act provides a limited grant of authority to the EPA to regulate the production and consumption of HFCs, which paves the way for new technologies and further innovation. Furthermore, it protects U.S. jobs across the HVACR industry. S. 2754 would phase down the production and import of HFCs over 16 years to gradually reduce the availability of older refrigerants until a 15% baseline remains.

This baseline will provide time to find acceptable alternatives to current HFCs and prevent consumers from being forced into changing equipment before the end of its useful life.

While phasing down HFC production, the EPA would authorize the use of new refrigerants in air-conditioning and refrigeration applications. The bill would also call for training programs to be available for the safe handling and use of any new refrigerants.

The AIM Act quickly received support with more than one-third of the Senate becoming co-sponsors. To move the bill towards becoming law, Senator Kennedy submitted the AIM Act as an amendment to the **American Energy Innovation Act** while it was on the floor on March 4, 2020.

However, a disagreement by Senator John Barrasso, chairman of the Senate Environment and Public Works Committee over specific sections of the bill stalled progress on the amendment and the bill. Chairman Barrasso, Senator Kennedy, and lead co-sponsor Senator Tom Carper began working together to resolve the issues shortly after the bill failed to move forward.

INTRODUCTION OF HOUSE BILL 5544

Simultaneously to the Senate's AIM Act, the industry also supported introduction of the **American Innovation and Manufacturing Leadership Act** (AIM Leadership Act), H.R. 5544, in the House of Representatives.

The AIM Leadership Act was introduced by Congressman Paul Tonko on January 7, 2020. The bill is functionally the same, but slightly different from its Senate companion.

The AIM Leadership Act went through a subcommittee hearing on March 12, 2020, just before the impact of COVID-19 became evident and Congress shifted gears towards slowing the spread of the virus.

Senate negotiations and the House Subcommittee hearing showed promise of passage early in 2020, however, the onset of COVID-19 and the subsequent legislating of relief bills left a policy void on the HFC issue.

The lack of a finalized policy allowed states to continue their efforts to regulate HFCs. HARDI does not support a patchwork of state-by-state regulations on HFCs because this makes it harder – if not impossible – for distributors to conduct business across state lines.

If the AIM Act is not passed, consumers, contractors, wholesale dis-

tributors, and manufacturers will be forced to follow different sets of guidelines in some states and no guidelines in others.

Several states have pledged to regulate HFCs due to the lack of federal regulations. In that effort, most states attempting to regulate HFCs are developing their own laws and regulations based on EPA's SNAP Rule 20 and Rule 21.

So far California, Colorado, Connecticut, Delaware, Hawaii, Maine, Maryland, Massachusetts, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, Vermont, Virginia, and Washington have announced or started to regulate HFCs.

California is the only state to look beyond adopting SNAP Rules 20 and 21. Their overall goal is a 40% reduction in HFC emissions by 2030. This more ambitious commitment has led California to start drafting rules which will impact commercial refrigeration and air conditioning.

The California Air Resources Board plans to evaluate and possibly adopt proposed rules in December 2020. Current proposals would affect commercial refrigeration on January 1, 2022, and stationary air-conditioning on January 1, 2023.

HARDI is supporting an industry proposal to delay the air-conditioning effective date to 2025, however federal action is the best solution to continuing regulations of HFCs by states.

POTENTIAL FEDERAL SOLUTION

But there is some good news. Recent movement in the House and Senate bring hope to a federal solution. In September the House of Representatives passed a large energy bill con-

taining the AIM Leadership Act.

After months of Senate negotiations, Senators Barrasso, Kennedy, and Carper have announced they have reached an agreement to advance the AIM Act as an amendment to the American Energy Innovation Act.

However, additional hurdles with other sections of the energy bill must be resolved before the Senate can consider the legislation. Complicating this process is a fight to confirm a new justice to the Supreme Court and several Senators testing positive for COVID-19.

These complications will force the bill to be considered during the lame-duck period, the session taking place after the November election.

If both chambers can pass bills containing their respective HFC phase downs, Congress could negotiate a final package through a conference committee to resolve differences between the respective bills.

If Congress passes this negotiated conference report and it is signed by President Trump before Congress adjourns, the AIM Act would become law.

Unfortunately, the lame-duck session of Congress will move quickly and it's difficult to predict what will and won't be finished before it is forced to adjourn and a new Congress begins.

OTHER ISSUES

While there remains a lot of uncertainty as to when Congress will pass legislation phasing down the use of HFCs in 2020, the industry is making progress to ensure a smooth transition occurs in the future.

HARDI is currently participating in AHRI's Safe Refrigerant Transition Task Force which is organized to find issues relating to existing regulations



ing and refrigeration refrigerants in the coming years. To ensure the next generation of products is available, the HVACR industry has invested heavily in the development of new refrigerants.

Unfortunately, current federal regulations have not kept pace with this level of investment and innovation. This means the United States is at risk of innovating first and regulating last – and being left behind as a result.

INTRODUCTION OF THE SENATE BILL 2754

To make sure the U.S. market has a smooth transition from current HFCs to future refriger-

and prevent issues surrounding lower flammability refrigerants.

One of the largest concerns the Task Force has identified is limits on storage of refrigerant cylinders containing lower flammability gases. Under the current fire codes, which are adopted by states and localities individually, the maximum amount of flammable gases allowed to be stored is significantly lower than current storage practices.

Part of this issue comes from the single definition of flammable gases used in the code that does not differentiate lower-flammability gases like A2L refrigerants from high-flammability gases the public is more familiar with.


Recently, the **Global Harmonized System for Classification of Chemicals**, which is used by na-

tions around the globe, was updated to include new categories of flammability, but these changes need to be adopted into the fire code used by states and localities.

A working group of fire code experts is developing a proposed update to the code to include these new classifications. HARDI has been assisting this working group to determine how much storage of lower-flammability gases, including A2L refrigerants, should be allowed. The group is expected to provide a proposal to the International Code Council this winter for adoption next year.

HVACR distributors have been superb in working through the uncertainty of operating a business during a global pandemic and HARDI has been

working hard to ensure the uncertainty of this year's policy process does not add to the worries of distributors.

HARDI will continue to work on these issues in 2021 and member companies are encouraged to participate in the policy process. 



Alex Ayers is Director of Government Affairs at HARDI, a trade association comprised of nearly 1,000 member companies, nearly 500 of which are U.S.-based wholesale distribution companies. More than 80% of HARDI's distributor members are classified as small businesses that collectively employ over 35,000 U.S. manufacturing workers. They represent more than \$35 billion in annual sales and an estimated 80% of the U.S. wholesale distribution market of HVACR equipment, supplies, and controls. He can be reached at ncilink.com/ContactMe.



"Airflow Relief"

— **Joshua Hoffman, Hoffman Heating, Swartz Creek, MI**

"We discovered a drastically oversized system where zoning was installed after the fact to try to solve comfort complaints. The issue at heart was airflow, or lack thereof, and oversized equipment. After testing and measuring, we designed and installed this replacement. The customer is finally comfortable."

Joshua Hoffman from Hoffman Heating is the November 2020 winner of our Photo-of-the-Month contest, as voted on by the subscribers to the **High Performance HVAC Today** and visitors to the website (hvactoday.com). He 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 DECEMBER CONTEST OPENS ON NOVEMBER 9, 2020

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

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Did You Miss Summit 2020? No Problem!

National Comfort Institute's 2020 Summit is in the books, but that doesn't mean members who couldn't attend have to miss out on all the great content presented there.

The COVID-19 pandemic forced almost all live meeting events to go virtual and Summit is no different. But that created an opportunity to record and capture much of the proceedings, breakout sessions, and workshops.

For the very first time, we are pleased to announce that **members can access**

the recorded Summit for 90 days for the low price of \$95.

To learn more about the Summit and register today to access session recordings, downloads, our virtual tradeshow and more click on GoToSummit.com.

The November PowerPack is Here!

This month we once again provide you with some additional content to help you with conducting and marketing your performance testing capabilities.



These tools include access to some of NCI's recorded webinars and downloads. Be sure to share them with your team during the month of November.

Please Note: Some of the tools included in the PowerPack each month may not be normally accessible with your membership subscription package.

However, you will be able to access these tools through this PowerPack portal during the current month.

So without further ado, here is what the November 2020 PowerPack includes:

- **Performance Tune-Ups That Really Perform** (Recorded Webinar)
- **Two Minute Duct Performance Test** (Download)
- **Not Warm Enough Postcard** (Download)
- **How Do I Choose the Right Contractor? Brochure** (Download)
- **Downloading the AirMaxx™ App** (Download).

Go to ncilink.com/PwrPak to access it today. If you have any questions, or if you are unable to access any of the tools in this program, please contact us at 800-633-7058.

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

California Utility Hosted Online Live Training for HVAC Professionals



NCI High-Performance HVAC training is now available to HVAC professionals throughout California. Southern California Edison, San Diego Gas & Electric, and Pacific Gas and Electric have partnered with NCI to provide advanced training and certification through its online, live classes.

These NCI classes also qualify for NATE (North American Technician Excellence), and BPI (Building Performance Institute) Continuing Education Credits.

Here's how the training works:

Certification classes: These online, live classes are provided in 4-hour blocks. For example our Residential Duct System Optimization and Commercial System Performance classes each consist of four, 4-hour segments of training over a two week period. Students who participate in these classes will also qualify for online-proctored NCI certification exams after the training.




Recertification classes: NCI-certified professionals can recertify for two years by participating in these online classes taking place over two consecutive half-days. We currently offer recertification training towards NCI residential and commercial certifications.

In addition NCI is offering several technical and sales non-certification classes.

National Comfort Institute thanks the following Investor-Owned Utilities for hosting this training for HVAC professionals throughout California:



November/December California Training Calendar

 ncilink.com/sce	 ncilink.com/sdge	 ncilink.com/pge
November 12-13, 19-20 1-5 PM Pacific Commercial System Performance Certification Class** 16-hour training program Regular Price: \$690 Student fee: Just \$100 per student	November 5-6 8 AM -12 PM Pacific Airflow Testing & Diagnostics 8-hour training program* Regular Price: \$395 Student fee: Just \$50 per student	November 3-4, 10-11 8 AM - 12 PM Pacific Commercial System Performance Certification Class** 16-hour training program Regular Price: \$690 Student fee: Just \$30 per student
November 17-18 1-5 PM Pacific Combustion and Carbon Monoxide Recertification 8-hour training program Regular Price: \$395 Student fee: Just \$50 per student	November 19-20 8 AM -12 PM Pacific Residential Airside Recertification 8-hour training program* Regular Price: \$395 Student fee: Just \$50 per student	December 3-4, 8-9 8 AM - 12 PM Pacific Duct System Optimization Certification Class** 16-hour training program Regular Price: \$690 Student fee: Just \$30 per student
December 3-4 1-5 PM Pacific Airflow Testing & Diagnostics 8-hour training program* Regular Price: \$395 Student fee: Just \$50 per student	December 10 8-10 AM Pacific Explore HVAC Performance 2-hour training program Regular Price: \$95 Student fee: Just \$15 per student	

* Qualifies for 8 recertification hours

** NCI Online Certification Exam included

Take an NCI Course Today! Call 800-633-7058 or visit ncilink.com/DistLearn

This program is funded by California utility customers and administered by SCE, SDG&E, and PG&E under the auspices of the California Public Utilities Commission.



Interested in NCI Membership?
 Find out more at www.NCIMembership.com



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www.GoodmanBusinessToolbox.com

For questions, please email GBTB@goodmanmfg.com or call 713-856-1853.

The business toolbox programs are presented by Goodman® and administered by third-party training organizations. All training programs are designed to support independent HVAC contractors who sell Goodman brand products. Any costs for the training programs are determined and charged directly by the third-party training organizations.



Our continuing commitment to quality products may mean a change in specifications without notice.
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