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Ready for Fall?

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Go Beyond the Boiler**

**Why Contractors Choose
to Test, Diagnose, and
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TECHNICAL:

From the Field: A Day in the Life of an HVAC Technician

In a typical day, whenever an HVAC tech creates a scope of work, they should consider that for every action they take, there is always a reaction.

SERVICE:

Turn Disaster into Delight: Going Beyond the Boiler

Contractor Tom Soukup turns a hydronics nightmare into a customer delight outcome. He explains the problems and his solutions.



MANAGEMENT:

Why Contractors Choose to Test, Diagnose, and Upgrade Systems

Rob Falke explains the advantages of differentiation in a marketplace riddled with dissatisfied consumers.

DEPARTMENTS

Today's Word	5
High-Performance Product Reviews	6
Contractor Spotlight: Jerry Kelly Heating & AC	8
Photo of the Month	19

Member Update	20
HVAC Smart Mart.....	21
Ad Index.....	21
One More Thing	22

Get Ready for Fall: Keep the Learning Going

As you read this, the crazy busy summer season is starting to wrap up and Fall is peering out from those first few leaves beginning to change color. Is your business ready for the change in season?

A lot of effort goes into getting ready. That includes making the investment in time and money to keep your team's education going.

Yes, training, in all its forms, is an investment in the future. It's an investment for the creation of good times and to protect your company during bad ones. It's about learning how to do your job better, to keep your team's skills sharp, and to find better ways to make your products and services more appealing to customers.

Experts will tell you that training should be measured based on the business metrics you wish to advance. What do I mean? Let's look at the example of taking that first step in Performance-Based Contracting™: how to properly install static pressure test ports. Think about some results you could measure over, say, six months following training. You could look for increases or decreases in:

- Revenue generated by trained participants and measured static pressures
- Error rate or system errors done by trained participants
- Customer satisfaction as it relates to trained participants
- Retention rate of trained participants.

Being able to measure the results you achieve through training is key to shifting your perception from it being an expense to an investment in the growth and success of the business.

We all know that technicians often are not too keen on classroom training, so it is important to find ways to help them develop a desire to learn. That includes mixing things up by combining classroom and hands-on training. Your

training can also include having them work with and learn about the amazing and cool test instruments and tools necessary to conduct High-Performances services.

By the way, there is nothing wrong with helping build technician pride by showing them how no one else in the market can do Air Upgrades. You can share customer kudos when trained technicians help them really see their comfort problems and resolve them.

For you, training and certification offer other advantages including market differentiation, higher ticket sales, "more betta" problem-solving skills, less personnel turnover, and they can even act as a magnet to attract new talent to your team.

For example, take a look at Casey Contreras' article on a day in the life of a service tech (page 12 or at ncilink.com/DayInLife). He shows how training can make all the difference in a technicians day.

Contractor Tom Soukup talks about how training and technical expertise allowed him to move from being an HVAC company into a specialist in hydronics and how that changed his profitability. That's on page 14 or at ncilink.com/hydronics.

Also read Rob Falke's article on how to get your techs on board by helping them understand the "Why" behind Performance-Based Contracting. This can lead to them becoming more enthusiastic about their technical and soft skills training. Check that out on page 17 or at ncilink.com/Why?

When you change how you treat training — from an expense to an investment — you change the conversation and your bottom line. That is a win for your company, a win for your technicians, and most importantly, a win for your customers.

So are you ready for the Fall heating and training season? 



Mike Weil is editor-in-chief and director of communications and publications at National Comfort Institute, Inc. Contact him at MikeW@ncihvac.com.

OFF THE WALL [TECHNOLOGY]



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Written By HVAC Professionals for HVAC Professionals

FIELDPIECE JL3RH PSYCHROMETER

Gone are the days of racing around a house with a psychrometer trying to reduce the time between register and grille temperature measurements. Fieldpiece has created the JL3RH wireless psychrometer. In Fieldpiece's efforts to respond to contractors input on tool design, the JL3RH is designed with flexibility and ease of use in mind.

The flexible neck and sliding mounting magnet simplifies mounting and positioning the probe tip to eliminate room air entrainment that affects the readings.

Several of these psychrometers can



be connected at one time, minimizing testing time while increasing measurement accuracy. For larger commercial systems, you can use Fieldpiece's Job Link smart-phone app to receive data from additional psychrometers, if necessary.

Using the Job Link app, you can enter airflow from AirMaxx and live Btu calculations are displayed on the screen. This becomes a powerful way to display the operating efficiency of your customer's equipment.

For example, two probes can measure equipment heating capacity in the heating season, and the customer can see improvements in capacity as you improve

combustion efficiency.

During cooling season, the probes can verify evaporator operation and indicate externally whether gauges should be connected to the system.

Learn more about AirMaxx at ncilink.com/AirMaxx. It can be downloaded for free at both the Apple and Google Play stores.

If you're looking for a tool to speed up or discover new service opportunities, visualize performance loss to customers, or ease the sales process by providing more facts to the customer, then the JL3RH is the tool for you.

For more information or to buy this instrument from the NCI Store, go to ncilink.com/FieldpieceJL3RH.

— Justin Bright, National Comfort Institute Field Coach and Instructor

TSI/ALNOR VELOCITY MATRIX

Watching my son while he plays takes me back to when I was a kid. I remember how anything that was in the shape of a sword was the coolest thing ever! Well, you can get that feeling back while you're at work. Become the air balancing Jedi that you deserve to be.

The **TSI/Alnor 801090 velocity matrix** has always been my fall-back instrument when it comes to using other tools in undesirable locations. Like a ninja in the night, the velocity matrix increases your speed and accuracy.

The velocity matrix is the same grid found in the bottom of balancing hoods. The difference is, it's on a stick. This instrument is extremely beneficial for measuring economizers, kitchen hoods, or if you are just too tired to move furniture

out of the way to use your balancing hood.

The TSI/Alnor 801090 16" x 16" matrix has a leave-your-ladder-in-the-truck feature, using a pole that extends and retracts. Just like any other velocity measuring device, the EBT730 micromanometer (that's used with the matrix) can be set up to display CFM (cubic feet per minute) on the screen.

This saves you time on math calculations. The device averages 16-point air volume/air velocity measurements and has an air velocity range of 25 to 2500 fpm (feet per minute).

However, the velocity matrix has one downside. For those of you who measure economizer airflow, it isn't the best



tool to use on windy days. Because the test ports are open with no protection, there could be large fluctuations in velocity measurements. When used to measure open-area airflow, it works very well.

All in all, it's a great instrument.

For more information or to purchase the 801090 Velocity Matrix, visit the NCI Store here: ncilink.com/VelocityMatrix.

To learn more about EBT73 Micromanometer, go to ncilink.com/EBT730.

To learn more about how to use this manometer, NCI members can download a Tech Tip here: ncilink.com/EBT730TechTip.

— By Casey Contreras, National Comfort Institute Field Coach and Instructor

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Prevention is the key to avoiding Carbon Monoxide hazards in the home. Each year thousands of people in the United States become ill or die from CO poisoning. Without full combustion performance & CO safety training, there is no way of knowing whether a system is safe or efficient.

Not only will you be saving lives by becoming CO Certified, but you will be opening the door to new sales opportunities and greater profit.

Learn more and Register Today at ncilink.com/CO or call 800-633-7058

NCI
National Comfort Institute, Inc.

Professionalism and Performance Require Continuous Training

Jerry Kelly Heating and Air Conditioning is a family-owned business founded by Jerry and Janet Kelly in 1977. In those early days, the company had five technicians who drove used trucks to jobs throughout their St. Charles, MO market area. Jerry has since retired and his son-in-law, Steve Miles has taken over. The fact is, Miles, who joined the company in 1994 as a dispatcher, has been general manager of the firm since 1998.



Steve Miles

When he first joined the company, Jerry Kelly Heating did mostly residential service and replacement with a small percentage of commercial work.

“We’ve always been into retrofit, replacement, and repair,” says Miles. After my father-in-law retired some eight to 10 years ago, we went strictly residential repair and replacement. We had one or two legacy commercial customers.”

Miles, whose background is in electrical contracting (he even owned an electrical contracting firm once upon a time), says he sat down and did an analysis of the company’s business model.

“Service drives replacement. You can make money at service, but the big dollars really come from replacement,” he explains.

“So I analyzed how much of our service revenue was commercial and how much was residential. I also compared commercial replacement revenue to residential. I found that 85% of our

service revenue was residential and 15% commercial. Replacement revenue came in at 95% residential and only 5% commercial.

“Then I had to guesstimate what my opportunity loss was putting off possible residential replacement customers for our commercial customers who mostly wouldn’t even use us if they did need new equipment.”

His conclusion? He says, “In commercial work, most of the time you are dealing with a tenant-landlord situation where the tenant is responsible for maintaining equipment and making small repairs. “The landlord is responsible for equipment replacement. In our case, we had a relationship with the tenant, not the landlord. Realizing this, we decided to make the switch to focus only on the residential marketplace.”

SEVEN-DAY WORK WEEK

At the time of Jerry Kelly’s retirement, the company was pulling in around \$7 million in gross revenue and fielded eight to 10 service trucks and three or four installation trucks.



With a seven-day work week, the company needed to ramp up personnel and vehicles. Today the team consists of 67 people and 16 to 18 trucks to cover the hours.

Today, Jerry Kelly Heating is pacing to do around \$12.5 million. Miles explains that they’ve gone to a seven-day-per-week schedule, so trucks get shared and today they have 16 to 18 service trucks on the road and seven installation trucks.

The team now consists of 67 people. Steve Miles says when you go to a seven-day work week, you need to put on more personnel to cover the hours and keep them from burning out.

When it comes to sales, the company has evolved from having just Jerry Kelly and Steve Miles selling, to having a professional team that includes a sales manager and two salesmen – all of whom report to Miles. They also have ‘selling’ technicians.

Just three years ago they moved into a new 21,000 sq. ft. facility. It’s set up in a completely open format – no walls, only a few offices, lots of windows. Miles explains the idea was to create a more open, collaborative environment. The keyword here is collaborative.

He is always on the lookout to find talented people, not necessarily from within the HVAC Industry, who have a mechanical aptitude and solid attitude.



Jerry Kelly Heating has a large training room in the new 21,000 sq.ft. facility.

CONTINUOUS RECRUITING

“I think our growth is really due to the type of people we have on our front lines. It revolves around finding and hiring the right people, training them well, and paying them well,” Miles says.

“We also visit tech schools and market to ex-military people and so on. It’s difficult, but you have to keep after it.”

To help, Miles says he is toying with the idea of hiring a professional recruiter. He adds, “We very seldom hire people with HVAC Industry experience. We find in this economy, if they are in the job market, there is a reason. So, we try to recruit people from outside the industry who have some mechanical aptitude and a desire to learn.

“Then we train them to be maintenance techs, using Joe Cunningham’s Technical Arts Center ([facebook.com/SuccesstrackNetwork](https://www.facebook.com/SuccesstrackNetwork)) in Houston, TX, Ben Stark’s Go Time Success Group (gotimesuccessgroup.com), Jimmy Hiller’s Total Tech (totaltechschool.com) and Ultimate Technician Academy (ultimatetechnician.com). Those are the four schools we use regularly.”

CONTINUOUS TRAINING

Miles says their training program can best be described as creating career paths for his technicians. New hires go to one of the above-mentioned schools for two weeks, depending on the courses

es offered and given times.

He describes his training program for new hires in three steps:

- Two weeks at one of the four out-of-town training schools
- Two weeks of in-house training to learn how we do things and how it translates to the real world
- Two to four weeks riding with a more experienced tech.

“So now we’re into eight to 10 weeks of training. After that, they will go out and run their own maintenance calls under supervision. Gradually we give them more “rope,” Miles adds.

“That is just for one season. When the next season rolls around, we repeat the process. So, they get eight to 10 weeks of training each for the heating and cooling seasons.”



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The new building's open floorplan allows even the sheet metal workers to feel more part of the team. Pictured here is the new and improved sheet metal shop.

Existing technicians – whether they are on service or installation crews – are required to obtain and maintain their NATE certifications within six months of starting their employment.

“In addition, we are 100% NATE certified,” Miles says. “We are also 100% NCI (National Comfort Institute) Combustion and CO-certified, and 100% of our field staff are Heat Exchanger Experts certified.”

THE NCI CONNECTION

Fifteen years ago, Steve Miles realized how very little he knew or understood about the combustion process and Carbon Monoxide (CO) production after having a conversation with NCI CEO Dominick Guarino at an industry event.

“I decided THAT had to change,” he says. “At the time we were big into condemning heat exchangers and I felt that everyone in the company needed to understand CO. In that effort, we brought Jim Davis in to educate us.

“Actually, we brought him in several times. I myself went through the classes and became CO Certified just to learn more about it. I’ve kept it up to date ever since.”

In other words, testing, diagnosing, and resolving CO issues became part of the Jerry Kelly culture around 2005 and remains integral to how they go to market to this day. Miles says his field team took to it almost from the get-

go with very little pushback at adding testing to their regular maintenance repertoire.

“Once they took NCI’s Combustion Performance and CO Safety training and saw how little they really knew, they became excited. They wanted to learn more. And as they got more efficient at it, they realized it was so easy to keep our customers safe and that gave them a great sense of pride.”

In fact, Miles says over the years, mostly through word-of-mouth, Jerry Kelly became the de facto CO experts in their service area.

He adds, “This wasn’t something we marketed a lot. It’s really hard to make

being CO-certified sound sexy. We do have it on our website, in our company bio, and in all the literature we hand out to customers. But with regard to advertising and radio/tv promotions, it really is hard to communicate.

“But in face-to-face meetings with customers we talk about what being CO-certified means to them in terms they can understand. We use it as differentiation during the sales process.”

“Our successes, especially in light of our CO training and certifications” Miles continues, “is that we’ve been able to identify hazardous appliances and put them out of commission.

“The challenges have been mostly from others who don’t have the training. This includes other contractors, utilities, even distributors. They contradict our diagnoses causing confusion in the marketplace. Again, this happens because they DON’T have the training. This makes our job of educating the customer a little harder.”

In the end, Miles says he believes that you need to learn what you don’t know.

“In the HVAC Industry gas furnaces are very safe appliances, thank goodness. The industry has more than 100 years of experience building these appliances. However, there are things about the combustion process you might not be aware of and, as a professional, it is incumbent on you to learn about it.”

THE RIGHT TOOLS FOR THE JOB

Training isn’t the only factor in Jerry Kelly’s success. A well-trained technician is only as good as the tools and instruments he or she has and knows how to use properly. Their field teams own all their own tools and instruments, but they buy them through Jer-

ry Kelly using a tool fund.

“They buy their tools through us, so we know they are using the right tools,” Miles says. “They pay off the purchase or get them forgiven over time through a \$25/week tool allowance program we have. As they need new tools, they can buy them on their tool account and pay them off over time.”

In addition, Miles says the company provides each tech with a \$25 per

work and delivering what you promise. That means working on the business by improving internal and external efficiencies, creating and improving procedures for everything, and performing at the highest level without causing your team to burn out.

And their ability to do these things show in the form of local and national recognition. For the last 24 years, Jerry Kelly Heating and Air Conditioning



Collaboration is key, which is why Jerry Kelly Heating is set up with an open floorplan.

week Warranty Reserve Fund that gets settled annually.

“We are a Performance-Based Pay company. This fund is set up to pay for callbacks. If a tech has a callback, he or she can go out and resolve the issue on their own or not. If they choose NOT to go back, we pay another tech to make that fix out of the first tech’s Warranty Reserve,” Miles explains.

“Whatever is left in the reserve at the end of the year is used to pay off their tool fund. The remainder becomes their annual bonus.

PROFESSIONALISM AND PERFORMANCE

For Steve Miles, success means building a professionally-operated business, one that runs not on price-to-the-consumer, but one that seeks to satisfy customers by doing quality

has been recognized as the number one air conditioning contractor in the St. Charles area, based on a local newspaper’s reader poll done annually.

Furthermore, they have been recognized by their peers with the following awards:

- **2018 Ron Smith Leadership Award** from Service Roundtable
- Service Roundtable’s **2013 North American Comfort Contractor of the Year**
- Contracting Business magazine’s **2006 Residential Contractor of the Year**
- Excellence Alliance **1999 Contractor of the Year**

It is for these and many more reasons that **High-Performance HVAC Today** magazine has selected Jerry Kelly Heating and Air Conditioning as this month’s Contractor Spotlight.

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From the Field: A Day in the Life of an HVAC Technician

HVAC technicians create solutions day in and day out. It's a simple task when you know what you're doing. What escalates the difficulty is not knowing the outcome when you make system improvements. The next time you create a scope of work, consider this: for every action, there is always a reaction.

Take driving a car for example. Step down on the gas pedal and you increase the car's speed (that's the action). But getting a speeding ticket (reaction) is a potential outcome. Another outcome is that I get to my destination faster. Similarly, any renovations you make to an HVAC

system can result in either a good or bad reaction.

Good performance-based technicians can think on their feet and use small windows of time to test, diagnose, and repair problems. But within that small window, you should ask yourself if you're overlooking the outcome of the changes you make.

NEW OPPORTUNITIES

After my training and two years of doing high-performance testing, my mindset was either I totally fixed a problem, or I walked away. It was all or nothing. That meant walking away from jobs if I couldn't fix 100% of the system. That plan was a bust!

After dealing with enough rejections, I figured out this approach wasn't working. Then I learned about optional duct renovations. I began offering these to my customers and my outcomes changed for the better. Learning how to do this work, and then doing it, increased my closing rates and profits. It also created new opportunities.

My first duct renovation started out as a no-cooling call. When I arrived, the customer took me to the outdoor unit insisting that it needed to be "topped off." Here was my first opportunity. I took time to educate him on what first needed to be done and why, before checking the refrigerant charge.

I explained the importance of static pressure and airflow in relation to refrigerant flow. His tone soon changed and he wanted to know how well the airside of his system was operating.

Like many systems out there, his system suffered from high return-duct pressure. Furthermore, his system's filter pressure drop was in the clouds and supply duct pressure was nowhere to be found. Very quickly, the customer understood there was more going on than verifying refrigerant charge.

From my perspective, this job needed a simple air upgrade. I also felt it needed more filter area, and another return duct. It wasn't a high-dollar ticket job, but it was very profitable because the material was so cheap.

LEARNING CURVES

But I didn't consider how static pressure reacts when there's a change in design. I diagnosed the system with an undersized return and filter. I proposed installing a 16" return duct, plus a 30 x 20 return air box with a 30 x 20 return air filter grille. The customer agreed and I went to work.

The air upgrade took three hours plus an extra hour for testing. I was to-the-moon happy with the install and greatly anticipated my first duct renovation would be flawless. Man, I couldn't have been more wrong.

I fired up the system and saw immediate positive results. The noise from the previous return grille dropped considerably. The customer couldn't believe it was running and after 15 minutes he was beyond satisfied with the work.

Unfortunately, testing painted a different picture.

TEST IN

First, before starting the job, I measured static pressure to determine what system components needed ren-

TEST IN	Measured	Budget
Return duct pressure	.36 in.	.10 in.
Filter pressure drop	.26 in.	.10 in.
Coil pressure drop	.15 in.	.20 in.
Supply duct pressure	.10 in.	.10 in.

ovation. These are the readings I measured and recorded.

I compared static pressure for each

component to its corresponding budget. Whenever measurements exceeded the budget, a renovation is likely. When you find the static pressure below the budget, I assumed that you leave it alone.

TEST OUT

In the world of Performance-Based Contracting™, it is standard practice to test out after your renovation work is completed to ensure you achieved what you set out to do. Testing-out the system was my next step and I felt the outcome was going to be good.

TEST OUT	Measured	Budget
Return duct pressure	.10 in.	.10 in.
Filter pressure drop	.12 in.	.10 in.
Coil pressure drop	.32 in.	.20 in.
Supply duct pressure	.41 in.	.10 in.

Believe me, it came as a shock when the test-out measurements told a different story. Return duct and filter pressure drop showed huge improvements. Keep in mind, I didn't touch the supply side besides sealing plenums and collars. So where did the high supply static pressure come from?

WHAT I MISSED

Despite being well trained and certified in this work, I didn't quite remember everything I learned. One of those things is Fan Law Two. In essence, that law states that static pressure squares with an increase of airflow.

Confused? Look at the numbers again. There's a reduction in static pressure on the return side (filter drop, return pressure). Remember, anytime static pressure decreases, airflow increases.

Why did the return duct and filter pressure drop decrease? Because

when you increase the size of a duct or filter, it's easier for the fan to move air through the system.

Why did coil pressure drop and supply duct pressure increase? This happened because removing the pressure on the return side allowed the fan to circulate more airflow.

Now that the fan airflow increases, more air moves through the coil and supply duct causing higher static pressures. As it turns out, the coil was dirty and had undersized supply ducts. I couldn't tell that from the test-in because of low fan airflow.

OUTCOMES AND LESSONS LEARNED

As trained professionals, it's our job to correctly assess and test each situation to improve the quality of life for all parties involved. Part of that is learning from both your training and your mistakes. We have so many tools at our disposal and it's easy to forget them, especially if we are not using them on a daily basis. In this case, that tool is Fan Law Two. If I had remembered it, I could have better served my customer.

Life in the field is all about continual learning and this was the best learning experience I could have had. It was the first and last time I made this mistake. From that point forward, I always remember that using the fan laws helps to predict outcomes.

Continue testing my friends. 

Casey Contreras is a trainer and field coach for National Comfort Institute. If you would like Casey to email you a link to a free App for your phone to quickly determine the airflow of residential fans in the field, email him at caseyc@ncihvac.com or call him at 657-227-6188.



Turn Disaster into Delight:

Go Beyond the Boiler



Tom Soukup, president of Patriot Water Heater, arrives to the jobsite.

We used to do general plumbing and a variety of HVAC work in southeast Pennsylvania. But over the past few years, we've transitioned to a sole focus on hydronic work.

Hydronic heating, and cooling for that matter, is a truly universal form of space conditioning. What other medium has as much ability, and flexibility? I can heat your building, your spa, pool, your DHW, melt snow, create process water, and just about anything else. And I can do it with nearly any fuel source you can think of.

I got my start in the trades 25 years ago. Our recent move to all hydronic has been so deliberate that we've recently created two new brands, EcoDronics and Patriot Pool Heater Company.

EcoDronics is our 'unconventional' hydronic brand. Think greenhouses, snowmelt, etc. It's different than general home comfort, so the new brand reflects that. Patriot Pool Heater Company does exactly what you'd think, but we accomplish that with condensing boilers instead of dedicated pool heating units.

The move into unique water-based heating ap-

plications doesn't mean that we turn down "traditional" boiler projects. Last month, a nearby homeowner asked us to give a second opinion on a dying mechanical system.

Our answer was the same as the first company that visited the home: a complete system replacement was needed. The difference is how we came to that conclusion, and the results we could deliver throughout the home, not just the boiler room.

I make a point to spend a good deal of time asking what the customer wants in regard to the system as a whole. Where do they need improvement — noise, comfort, energy efficiency, control? Are there areas of the house that go unused? I need to know what the homeowner really wants so my team can deliver it.

MURPHY'S LAW

This customer's system was 25 years old, and it's a wonder it lasted that long. Anything that could have been installed wrong, had been.

There was no primary/secondary piping, no air elimination, no feed valve, and the pump was on the return side of the boiler. Water returning to the cast iron boiler was too cool and the heat exchanger was condensing. The combustion chamber had collapsed, sections were leaking, the flue pipe was rotten, oil use cost well over \$3,000 per year, and the home was horribly uncomfortable. Long piping runs and high head pressures created by strange piping were causing both condensation and comfort issues.

The house was zoned horizontally, right down the center, instead of being zoned upstairs and down. So, the upstairs was sweltering hot while

downstairs occupants froze. The parents ran an electric space heater in their downstairs bedroom so that the kids upstairs wouldn't sweat all night.

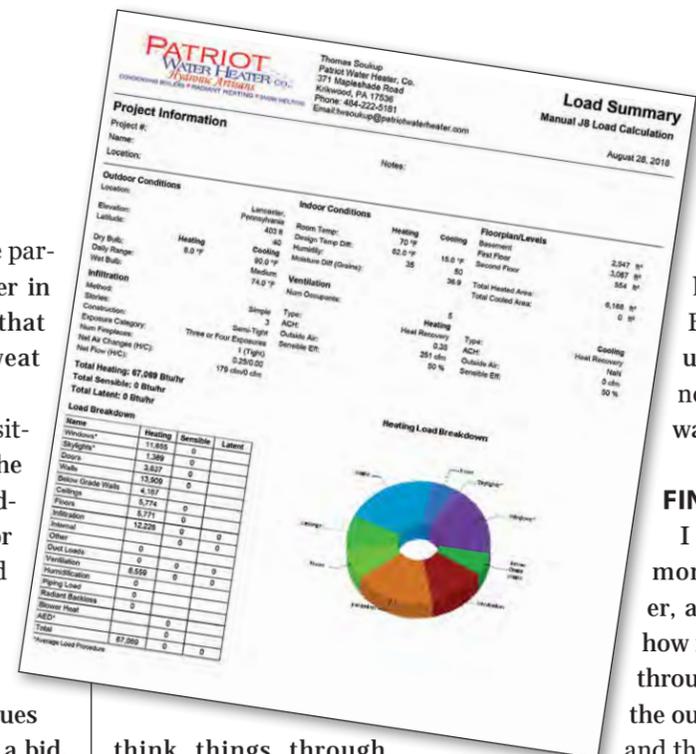
When the first contractor visited the home, they condemned the boiler but had no interest in addressing the comfort issues, or how the fin-tube radiation had been piped.

My apprentice and I had a combined 16 hours into analyzing and diagnosing all the issues with the project before we gave a bid. First we performed a Manual J and an EDR (equivalent direct radiation). An EDR calculation determines the amount of radiation in a system.

It's the standard method for determining replacement steam boiler sizing, but it's helpful on any hydronic retrofit.

RUBBER, MEET ROAD

Over the course of four days, we completely revolutionized the heating system. Aside from the baseboard and some copper pipe, everything was replaced. As is usually the case when you



think things through before grabbing a pipe cutter, the install was relatively straightforward.

My apprentice, Ben Dyson, and I installed a K2 condensing boiler made by U.S. Boiler Company. Considering the efficiency increase from 80% to 95% AFUE, and the fact that we actually sized it properly, we expected at least a 30% reduction in energy spend.

The existing supply and return piping were divided into six zones, separating the upstairs and downstairs and creating a few new zones in the process.

A seventh was added for domestic

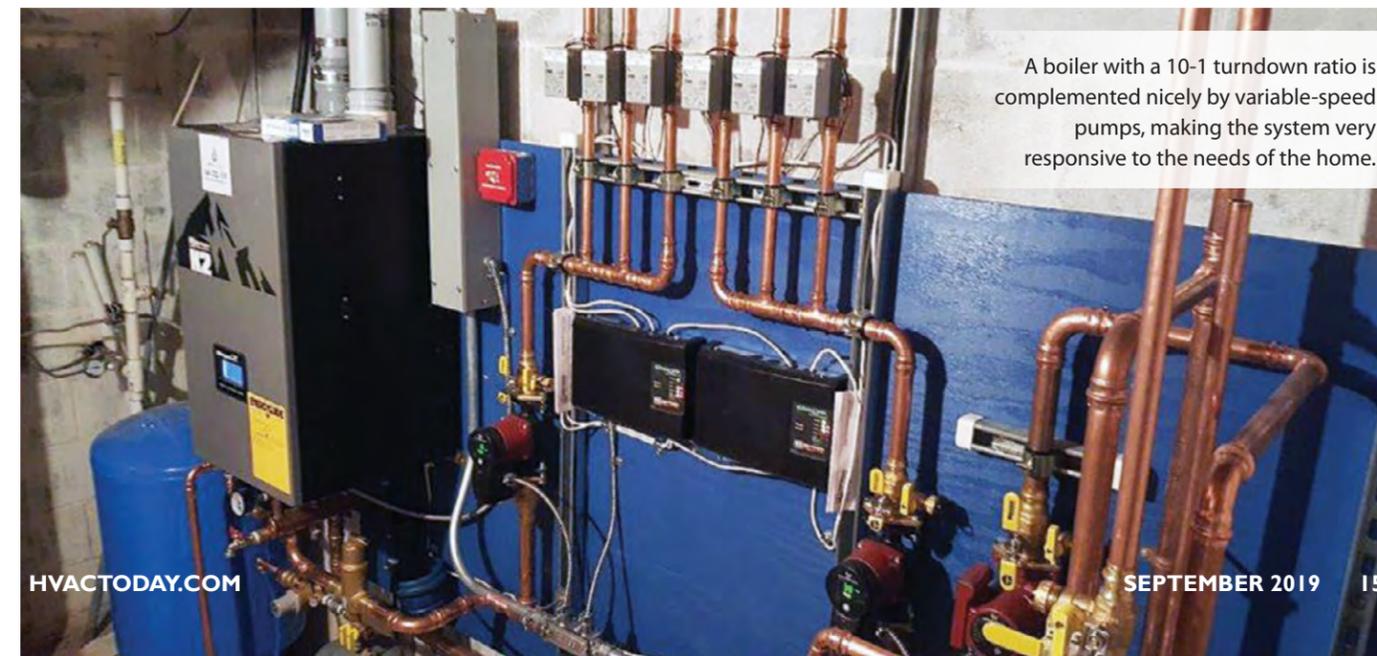
hot water. A 35-gallon U.S. Boiler Alliance SL tank was used because of its top connections. The existing electric water heater was removed.

FINE-TUNED SUCCESS

I visited the home on the morning after I fired the boiler, and the customer mentioned how nice it was to have even heat throughout the house. At the time, the outdoor temperature was 31°F and the boiler was running at 20% input. Nonetheless, there was still a little room for improvement."

Through the K2 boiler's touchscreen display, we accessed the zone-by-zone runtime data and noticed that the living room was calling for heat too often. So, we lowered the anticipated Btus slightly on the boiler's Sage Zone Control and set the programmable thermostat's temperature differential from one to two degrees. That solved the issue.

That's what I love about these. Once I program the control, I can get really granular by looking at individual parts



A boiler with a 10-1 turndown ratio is complemented nicely by variable-speed pumps, making the system very responsive to the needs of the home.

SERVICE



The final hydronic solution included a K2 boiler, Sage Zone Controls, and the Alliance sidearm tank.

of the system. This allows me to fine-tune the system. If you plan to install a modulating boiler, isn't fine-tuning the ultimate goal?

On commercial projects specifically, we've begun installing a meter on the gas valves of the systems we will be retrofitting, sometimes a year in advance. It's a fantastic way to compare the energy use before and after a

retrofit, and we can use those concrete numbers to sell the next project.

For residential jobs like this – which don't typically provide us with enough data collection time on the front end – we use the owner's records.

On this job, the owners knew they'd used 2,200 gallons of fuel oil (308,000 MBH) the previous year. The year following the retrofit required 800 gal-

lons of LP gas (73,600 MBH). Those numbers don't include DHW production either, as DHW had previously been supplied by electric, and are now provided by the boiler via the sidearm tank. And an electric space heater is no longer used in the master bedroom.

That's a staggering improvement, but at the end of a cold winter day, it is pretty hard to quantify comfort.



Tom Soukup is the principal of Patriot Water Heater Co. with over 20 years as a hydronic designer and installer. He specializes in high-efficiency and green technology, and brings his expertise to custom commercial work, pool heating, and agricultural projects. You can reach him at: twsoukup@patriotwaterheater.com.

MANAGEMENT

By Rob "Doc" Falke

Why Contractors Choose to

Test, Diagnose, and Upgrade Systems

Why an NCI technician chooses to pull out a manometer to peer into a system's performance is something I think about every day. This extra effort works like a key that unlocks unseen opportunities to solve problems, delight customers, and earn handsome financial rewards.

Let's take a look at four reasons why you may choose to grow a healthy company culture that tests and diagnoses your customer's HVAC system performance. We'll also look at the value a system upgrade brings to your customers and the beef it adds to your bottom line.

DELIVER VALUABLE SOLUTIONS OTHERS CAN'T

Air conditioning systems have been around more than 100 years. Fortunately for us, only a handful of people are aware of how poorly installed air conditioning and heating systems perform. The opportunity to harvest this work is ever increasing as equipment efficiency continues to improve, while installed system efficiency continues to decline.

Fortunately, the family of NCI professionals is among the few who are qualified and able to discover and improve installed system efficiency. The fact is, this service is needed everywhere and invisible to your competitors. These solutions earn far higher margins than service or installa-

tion rates if you develop the confidence to offer them for what they're worth to your customers.

For example, Henry Ford had a boiler problem and factory production screeched to a halt. He called Nikola Tesla for help. Tesla arrived, diagnosed the problem and placed an X on the boiler. He smacked it with a hammer and the factory geared back up. Tesla sent Ford an invoice for \$10,000. Ford, surprised at the cost for the short service visit, asked him to detail the invoice. Tesla wrote, "Use of the hammer, \$1. Knowing where to strike with the hammer, \$9,999."

When you build a company culture that tests, diagnoses, and upgrades HVAC system performance, your company moves from offering labor to delivering professional services. You are paid for your superior knowledge and skill, which earns far more than hammer smacking.

HVAC SYSTEMS DON'T HAVE SPEEDOMETERS

Say you buy a new car, which you're confident can drive down the highway at 70 miles per hour all day. You take it on the road and find everyone's passing you while your pedal is to the metal. You read the speedometer and see the car will only go 35 mph. Of course, you'd head straight back to the dealership and get your money back.

An air conditioning system has no speedometer, and you can't see other systems passing you



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on the road. Its performance is invisible and unknown, except for a few bothersome annoyances your customers have complained about for years without receiving a solution.

When a technician uses a combustion analyzer or another test instrument, it acts as a speedometer making system performance problems visible to the technician. At that moment, your company enters a market without competition, having earned the right to be paid what you're worth. The value solutions can bring is two to four times the hourly labor rates you typically earn. The work is thoughtful and challenging, which means you will begin to employ sharp minds, not just strong arms and backs.

And yes, someday, you'll use your mad skills to actually install speedometers on the systems you build, upgrade, and service. Your customer's system performance will appear on your dispatcher's dashboard to identify breakdowns and predict performance improving repairs around the clock.

RECRUIT, ELEVATE, AND RETAIN TECHNICIANS

Recent discussions with owners of Performance-Based Contracting™ companies revealed the key to their success is training and enlisting technicians to test, diagnose, and upgrade poorly performing HVAC systems.

With the support and leadership of company management, technicians are the front line. Remember, this work begins when the certified technician pulls out his or her test instruments to peer into a system's performance.

Successful performance-based contractors agree the company must be

fully committed to training technicians and other co-workers. This creates knowledgeable team members and an elevated culture where testing, diagnostics, and system upgrades thrive. Technicians can't help but test when immersed in such a culture.

Engaged technicians quickly understand the mission of performance. They have danced around it every day of their careers but had no speedometer or a target. They have been unable to properly measure or improve installed system performance.

Performance-Based contractors report trained technicians are more engaged in their jobs and that creates stronger company loyalty. As confidence grows, their ability to explain and sell more services to their customers skyrockets. Your customers love being educated by a technician.

As recruiting new techs is becoming critical in our industry today, training and having a high-performance mission becomes a magnet for new talent. This is true inside and outside the industry. Trained techs love to contribute to a cause and many feel they belong more and are motivated to improve themselves and others.

Techs take great pride in knowing they are among the best in the country. Being certified in the tenets of Performance-Based Contracting™ is often considered the highest professional credential they have earned. The very nature of their job changes when they find hidden problems, upgrade performance, and then verify they delivered what was promised to their customers.

DELIVERING A UNIQUE PRODUCT

Imagine a product that your company creates from scratch and is needed

and wanted by nearly every customer you have. This product is system-improving performance upgrades. You specify it, design it, build it, and then verify it delivers the promised results. You keep nearly 80% of every dollar earned by this product and the cash remains in your company. Often, less than 10% of the job cost is paid out to a manufacturer.

You set the system upgrade value without competition because every system-performance upgrade is a custom project. This product often increases system performance by more than 35%. What's that worth and what other product can top those results?

Beef to the bottom line is earned by adding \$2000 to \$4000 system upgrades, with a 50% to 70% gross profit to most of your equipment change-outs. There are zero advertising costs and the expense of job mobilization is already covered in the equipment installation cost.

Before your company can sell and earn the high net profit that system upgrades deliver, first you must possess the ability to deliver the goods to your customers. Which is why each year NCI improves its ability to support and help you build the culture of testing, diagnostics, and upgrading system performance into your company or career.



Rob Falke co-founded National Comfort Institute in the early 1990's and leads the technical training and curriculum development teams of the company. Rob's vision is that the performance of an HVAC system can be effectively measured and diagnosed under live operating conditions in the field. He can be reached at RobF@ncihvac.com.



“Now that is a Downflow Installation!”

— Joe Lozano, Liberty Air, Covina, CA

Whoever installed this furnace really had a strange idea of downflow. No wonder Liberty Air was called in, eh?

This is a WTH moment. Joe Lozano from Liberty Air wins the September 2019 Photo of the Month contest, as voted on by the subscribers to the [High-Performance HVAC Today magazine](#) and visitors to the website.

He will receive a \$50 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 OCTOBER CONTEST OPENS ON SEPTEMBER 14, 2019.

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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MEMBER REWARDS

Training Incentive Partner Program

Convert incentive dollars into NCI Bucks for immediate use to train your Performance-Based Contracting team.

Why is this such a great benefit? Let's face it, training is a big investment in terms of time and money. TIPP is designed to earn incentive dollars toward training through purchases of equipment, products, and services that you already buy from NCI industry partners. So when you do have the time to train your team, the dollars are already banked, ready to be used.

Put your TIPP incentive dollars to work! Call **1-800-633-7058**

National Comfort Institute, Inc.

Your September PowerPack is Ready!!!

NCI membership offers an experience you just can't find anywhere else. There are too many benefits to elaborate here, which is why NCI recently introduced the monthly **PowerPack**. This was created to help you become more familiar with all that NCI membership has to offer.

Each month's PowerPack is designed to help you explore different tools you can use in your High-Performance contracting business.

For September 2019 we feature the following:

- ▼ **Create the Ultimate Fall Marketing Strategy** (Webinar)
- ▼ **Important Test Results** (Download)
- ▼ **NSI 3000 CO Monitor Sales Ideas** (Download)
- ▼ **Why Should I Demand a CO Test Brochure** (Download)
- ▼ **Introduction to Carbon Monoxide** (Online Training).

Be sure to share your PowerPack with your entire team!



Each monthly PowerPack is only available for 30 days. So be sure to go online and get started today at ncilink.com/PwrPak.

If you have any questions, or if you are unable to access any of the tools in this program, please contact your Customer Care team at 800-633-7058.

Summit 2020 Early-Bird Deadline is November 1

If you haven't already done so, mark your calendars for April 6-9, 2020. That's when the National Comfort Institute (NCI) **High-Performance HVAC Summit 2020** (gotosummit.com) returns to the We-Ko-Pa Resort & Conference Center in Phoenix, AZ.

And be sure to register before November 1st and take advantage of our incredible Early-Bird rate.

Summit 2020 is shaping up nicely. Its theme is "Coach Your Team to High Performance." Attendees will learn skills to better communicate with co-workers

the expectations and goals of becoming performance-based.

We're also bringing back the popular



golf-outing. Plus there will be additional training/education opportunities from our partners.

The core NCI conference includes two days of breakout sessions topped off with the annual NCI Awards Ceremony. And the best part – you can register right now for the conference and save hundreds! Plus, as members you can apply your NCI Bucks towards the event and earn Bucks back on money you do spend.

So don't miss out. Simply click on the **REGISTER TODAY** link (ncilink.com/Summit2020Reg) to take advantage of the Early-Bird rates and get your team set for April 2020. Once pre- and post-con options are available, you'll be the first to know.

Questions? No problem. Call Customer Care at 800-633-7058.



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AD INDEX

Advertiser Index

Baker Distributing Company BakerDist.com	19
Dwyer Instruments, Inc. www.dwyer-inst.com	2
Goodman Manufacturing www.GoodmanMfg.com	4
Jackson Systems www.JacksonSystems.com	6
Lazco Corp. www.LazcoCorp.com	10
R.E. Michel Company www.REMichel.com	16
The New Flat Rate www.TheNewFlatRate.com	21
To Your Success ToYourSuccess.com	21
United Refrigeration Inc. www.uri.com	9

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HIGH-PERFORMANCE HVAC TODAY

Publisher
Dominick Guarino

Editor-in-Chief
Mike Weil

Art Director
Connie Conklin

Online Development Director
Brian Roseman

Circulation Manager
Andrea Begany- Garsed

Editorial Assistant
Marge Smith

Email us at contactus@hvactoday.com with your comments and questions.

Uncover New Opportunities This Fall



Dominick Guarino is publisher of HVAC Today magazine and CEO of National Comfort Institute, Inc. He can be reached at domg@ncihvac.com

For most of the country, Fall means maintenance agreement visits and heating system tune-ups. Your Fall marketing should be in full swing and you are likely getting your techs ready for the heating season.

Fall is also a phenomenal opportunity to generate new business from testing systems during your maintenance visits. If done right, a large percentage of these visits can be converted to additional opportunities for improving HVAC systems. This includes duct renovations, accessory sales, and equipment replacements.

The secret to these additional sales is equipping your technicians with the tools, knowledge, and training to succeed. A crucial component is effectively communicating to your team the processes you want them to follow. This starts with the testing they should perform and in what sequence.

It's important to reach agreement with your field people on how they should collect and interpret test data, and communicate their findings to your customer. Next, you must have a process in place to follow up on these opportunities. You will need to communicate how handoffs should occur with everyone involved in the process, both in the field and your office.

Sound like a tall order? It can be if you don't practice good communications within your company. Effective communications are at the heart of implementing any new process in an organization. We often think that shooting off a memo declaring "this is how we will do this," somehow magically gets absorbed by everyone in the company, and they know exactly what to do, and when. The truth is you must take the time to effectively communicate and train your people on what you expect to happen.

A good sign you are effectively communicating is when your team members repeat back to you what they think they heard, and even better, challenge some of the details of the approach and make constructive suggestions. Some people call this "buy-in," others call it empowerment, or participative management. The bottom line is when your people

are part of the solution, your chances of success rise exponentially.

So where do you begin? Since most leaders in HVAC businesses are salespeople at heart, think of it as preparing and executing a sales call for a new product. The only difference is you are selling internally. Start with the 30,000 foot view. How would you communicate your vision of the new approach? In this example, it's "Generating opportunities for new business through performance testing."

Microsoft PowerPoint™ can be a great tool to gather your thoughts in short concise statements or bullet points. Just don't overdo it – keep it short and simple – think of it as talking points for a presentation. Once you've outlined the high-level view, break it down to how you want to roll the process out. This is where more detail is appropriate.

A flowchart is a great way to show who should do what, and in what sequence. It doesn't have to be fancy – it could be on a white board. If you want to do something more formal, there are some simple and inexpensive software tools like Lucidchart (lucidchart.com), that allow you to quickly create flowcharts to illustrate the process.

Don't be inflexible on how the details might work. In fact, you should encourage dialogue on how the new process could be better tweaked. Again, this invites buy-in. As you roll out the process, try to identify "champions" who get the most excited about it. Your champions will help keep things going as some team members will inevitably start to run out of steam.

Once you have a good process outlined and communicated effectively with your team, the next step is to equip them with the training and tools to succeed. As their leader, your role should be to remove as many roadblocks as possible to help ensure their success and your company's.

The great thing about this process is you can apply it to anything you want to implement or improve. If you aren't doing this already, give it a try. You'll be very happy with the results. 



Cutting-edge Training from the Industry leader in Performance-Based Contracting™

Think you know airflow? Think you know carbon monoxide safety? Think you know how to solve your customer's comfort issues? Be sure. Don't guess. Find the training and expertise you need from the National Comfort Institute (NCI). Only at NCI will you find certification courses like Duct System Optimization and Combustion & Carbon Monoxide Safety, taught by leaders and innovators in the HVAC industry. Find out why NCI says "If You Don't Measure, You're Just Guessing!™" Visit the link below or call 800-633-7058 to find classes near you.

Upcoming 2019 NCI Training Schedule

Airflow Testing & Diagnostics

Oct 8: San Diego, CA
Oct 22: Los Alamitos, CA*

Refrigerant-Side Performance Certification Program

Oct 9-10: San Diego, CA
Oct 23-24: Los Alamitos, CA*

Airflow Testing & Diagnostics and Refrigerant-Side Performance Bundle

Oct 22-24: Los Alamitos, CA

Duct System Optimization & Residential Air Balancing Certification Program

Sept 10-12: Arlington Hts., IL
Sept 17-19: Howell, MI
Oct 1-3: Los Alamitos, CA*
Oct 8-10: Sheffield Lake, OH

Commercial HVAC System Performance Certification Program

Sept 10-11: Los Alamitos, CA*
Oct 8-9: Carrollton, TX
Oct 22-23: White Plains, NY

Residential HVAC System Performance & Air Balancing Certification Program

Sept 17-19: San Antonio, TX
Sept 17-19: Charlotte, NC
Sept 24-26: Los Alamitos, CA*
Sept 24-26: Halethorpe, MD
Oct 1-3: Tampa, FL
Oct 29-31: South Plainfield, NJ
Oct 29-31: Las Vegas, NV

Combustion Performance & Carbon Monoxide Safety Certification Program

Sept 10-12: Chantilly, VA
Sept 17-19: Somerville, MA
Sept 17-19: Sheffield Lake, OH
Sept 24-26: Golden Valley, MN
Sept 24-26: Sandy, UT
Oct 1-3: Mobile, AL
Oct 1-3: Hauppague, NY
Oct 8-10: King of Prussia, PA
Oct 15-17: Phoenix, AZ
Oct 22-24: Austin, TX
Oct 22-24: West Allis, WI
Oct 29-31: Sacramento, CA
Oct 29-31: Omaha, NE

*NCI training subsidized by Southern California Edison

Commercial Air Balancing Certification Program

Sept 10-12: Florence, KY
Sept 17-19: Los Alamitos, CA*
Oct 22-24: Union City, GA
Oct 29-31: Irwindale, CA*

Performance-Based Selling Bootcamp

Oct 15-17: Los Alamitos, CA*

Introduction to Hydronic Testing, Adjusting, & Balancing

Oct 8-9: Los Alamitos, CA*

Optimize Economizer Performance with Certification

Sept 12: Los Alamitos, CA*

National Balancing Council Commercial Balancing with Certification

Sept 23-27: Sheffield Lake, OH



It's All About Your Success.

Your key to success in Performance-Based Contracting™ is a strong support network – always there when you need it. NCI helps its members overcome the typical hurdles associated with implementing this measured performance approach.

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Find-A-Certified Professional Lead Generator	✓	✓	✓
i-NCI: Mobile-Friendly Technical & Sales Tools	✓	✓	✓
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Members-Only Newsletter	✓	✓	✓
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Live & Online Training and Conference Discounts	✓	✓	✓
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Training Incentive Partner Program Dollars	Maximum	Maximum	✓
NCI Online Store Discounts	✓	✓	✓
ComfortMaxx Air™ - Airflow Testing Software	✓	✓	✓
Unlimited Online University Courses	✓	✓	
Unlimited Webinar Access	✓	✓	
Bonus Annual NCI Training Bucks Earned	\$4200	\$1200	
ComfortMaxx Pulse™ - Air & BTU Testing Software	✓	✓	
ComfortMaxx Verify™ - Full System Testing Software	✓		
Free Print Subscription to High-Performance HVAC Today	✓		
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