2018 OUTLOOK

Experts Predict HVACR's Future

VRF, tech training, smart technologies, A/C and refrigeration trends top panel's list of predictions.

A panel of HVACR experts from across North America have weighed in on where they think the industry is headed for 2018 and beyond.

The veteran panel touched on numerous hot topics, including supermarket-residential-light commercial refrigeration, A/C and building automation, training, online learning, residential trends, smartphone technology, Variable Refrigerant Flow (VRF) systems, technician availability, codes and standards, demand control kitchen ventilation, and more.

Predictions for 2018

Bill Artis, Consulting Sales Engineer, Daikin Applied:

→**VRF systems**—These are continuing to advance in efficiencies, product portfolio and application capabilities. With just about every manufacturer carrying a VRF line now it is expected that the competition for market share will continue to get tougher.

→**Demand Control Kitchen Ventilation (DCKV)**—With many of the major energy conservation measures having been done already (lighting retrofits are so 2012), energy consultants and Energy Service Companies (ESCOs) are looking for new ways to further reduce building energy consumption, and they are finding it in DCKV, which is showing excellent potential as a major energy retrofit to facilities with long hours of operations for their kitchens with varying demand throughout the day.

According to the EPA's Energy Star Emerging Technology Award, "DCKV provides control over the ventilation system by modulating the speed depending on cooking activity. Traditionally, commercial kitchen ventilation systems operate at their maximum designed speed/volume throughout the duration of the kitchen's operating hours, or provide manual control over two speeds. In contrast, DCKV provides automatic, continuous control over fan speed in response to temperature, optical or infrared (IR) sensors that monitor cooking activity or direct communication with cooking appliances."

→**Variable Speed Everything**—While VRF systems were the first system type outside of chillers to significantly promote variable speed compressors, not counting digital scrolls, we are seeing this change with the technology being included in many other system types, including water source heat pumps and rooftop units.

In addition to the improved part-load energy performance, variable speed compressors are reducing reliance on hot gas bypass and reducing the potential for coil freeze-ups with variable air volume DX systems. The downside is that while the equipment's part-load performance is improving greatly, the rating standards for testing these different equipment types has not quite caught up yet, and as a result there is no AHRI certified performance/efficiency data for many of these systems.

→**Codes and Standards—**We are seeing the energy codes becoming more and more stringent in their requirements for things like economizers, variable speed control, and efficiencies. One very interesting aspect will be the economizer requirements in future editions of ASHRAE 90.1 and the International Energy Conservation Code (IECC), as they pertain to systems like VRF. In its current wording, the IECC makes the application of VRF systems extremely difficult, but does not seem to factor in the actual lifecycle cost of using these systems. While I do not speak for ASHRAE 90.1 or their Mechanical Subcommittee, having attended some of their recent meetings I can say they are considering the affects of utilizing heat recovery VRF systems in place of economizers and may have prescriptive requirements to guide applying these systems in the future.

James Bowman, National Technical Manager-HVACR, Rectorseal:

→**Training—**As a trainer, my insights will be most expansive in this arena. To try to see future trends I will have to digress into what I am actually seeing in my trainings and travels.

Licensing Continuing Education (CE) requirements: Some states have strict requirements while others do not have any requirements for HVAC licensing, let alone CE. Some of those attending training are only there to gain the required credits while the majority actually wants to learn new things. Most distributers and many manufacturers have full-time trainers and training rooms. A lot of focus I see in HVAC media is on OEM-specific training and less on general training. By the same token a lot of "technical" classes are not that technical. A lot of cities have independent training agencies, in addition to local ACCA affiliates, PHCC, RSES or other local trade groups.

→**Online Learning—**The big growth I am seeing is in the form of online training. YouTube, podcasts, TED Talks, etc. are emerging more and more. This is not exactly a great thing, as I am seeing that anyone with a smartphone and an opinion is teaching some not so good/inaccurate stuff online. However, I also see a trend of some good quality educational opportunities through online portals. The secret is finding a way for those seeking education to figure out the difference. As the need for more technicians continues to grow and the resulting influx of inexperienced people join the trade, more quality and easily accessible training is vital. And it appears to me that online/digital training is posed to fulfill the need, albeit like anything, we will get the bad with the good.

→**Technology—**It will continue to expand its capabilities with smart/connected devices and equipment. I do believe, although maybe not in 2018, we may hit a plateau in technological advances. Advanced tools and test equipment will continue to grow as more young people enter the market that will be willing to pay for the advanced technology that many of us older guys will not.

→**New Refrigerants/Higher Efficiency Commercial Equipment—**This will be a mixed bag. Due to the uncertain political and regulatory environment, some manufacturers will double down on new products/refrigerants and technologies aimed at energy efficiency and climate change, while others will pull back and wait, depending on how far they have already invested in this category.

Brynn Cooksey Sr., CMS RCT, HVACR Instructor, DTE Energy:

→**Technology—**The smartphone is an increasingly useful tool for HVACR technicians. Here some key smartphone trends that will help techs be more effective and efficient:

→**Instrument Tools—**Several HVACR tools on the market connect to smartphones via Bluetooth or Wi-Fi technology. Most measuring instruments are now compatible with smartphones; either directly or by interfacing with a smart device and compiling the information it produces. Using a smartphone this way may help keep files organized and available for future use.

→**Mobile Apps—**Manufacturers have developed mobile applications that deliver useful information—installation and operation manuals, wiring diagrams, parts and availability and warranty—to a tech's fingertips in seconds. The list of helpful information available via apps continues to grow. Some apps even show the nearest location where a part can be found and if it is in stock. Fast Tech Mobile, Totalline, and East Coast Metals are a few mobile apps available for free.

→**Precise Controls—**Manufacturers have taken a bite out of the commercial HVACR controls arena and made HVACR system control from remote locations viable. There are many products, including thermostats, controllers and other equipment, with internet connectivity that allows techs to control and monitor HVACR systems from anywhere in the world. The benefits of these technologies are undeniable, so do not be surprised if a customer asks about applying them to existing systems.

→**Education and Training—**Continuous improvement and professional development are critical for HVACR techs. For 85 years now, RSES has provided innovative training on all aspects of the HVACR industry. Here are some key education and training trends:

→**HVACR Skills Gap—**There are not enough qualified HVACR service or installation techs. All skilled trades are experiencing a worker shortage, but the HVACR industry seems to be at the top of the list. For more information, visit the Department of Labor's website at www.bls.gov. HVACR technicians can look for increased wages and benefits because

of the skills gap. Despite the high demand, the key factors behind landing the best gigs will forever be a well-rounded skillset and the willingness to keep up-to-date with the latest technology and acceptable trade practices.

→**Low Enrollment at Trade Schools and Community Colleges**—Some community colleges and trade schools are experiencing all-time low enrollments. This is a prime opportunity to talk to young people who are looking for a new and exciting career.

→**New Technology, New Skills**—Ever-evolving technology from HVACR manufacturers means that techs and contractors must continually update their training to provide the best-quality service to customers. RSES was founded to help the everyday service person learn and better understand the equipment he or she is working on.

→**Equipment market changes**—High-efficiency demand: The demand for high-efficiency equipment will ultimately drive manufacturers to design only equipment containing ECMmotors, larger heat exchanging surfaces, or even transition to geothermal systems. Take a browse through the Sustainability Series publications in the RSES online store www.rses.org/onlinestore.aspx). There are some great publications written by industry experts that will give you a leg up on the competition.

→**Performance Verification**—Performance Verification Documentation is becoming a mandatory task for HVACR techs. This includes verifying that the equipment being installed or serviced can meet the load and airflow requirements for which it was designed. Operational and safety verifications must also be performed. All of this is done through field measurements and calculations. Some locations already require Performance Verification Documentation, but it is a good idea to start doing this as everyday practice.

Dave Demma, National Accounts Manager, United Refrigeration:

→**Technician Availability**—First and foremost is technician availability and how the lack of supply might affect wages. Will this have any impact on existing techs seeking out additional training, or make them more complacent because of the technician shortage?

→**Smartphone Interaction**—How smart phones interact with controllers, equipment, thermostats, etc.; will this be continuing trend? If so, who is leading it and what is available?

→**VRF-VRV Systems**—These will continue to displace commercial package units and chillers in small to medium commercial applications. When will we start seeing this technology in refrigeration systems?

Jeffery Smith, Owner, J.A. Smith Heating and Air Conditioning, Inc.:

→**Residential Trends**—The residential trends that will continue in 2018 will be a continued push towards connected control systems and remote access via Wi-Fi. We will also see an increased percentage of systems going with zone damper systems to improve comfort and reduced energy consumption.

A higher percentage of variable speed compressors will be installed compared to 2017. The mini split market will continue to mature with a higher percentage of multi-zone systems being installed. Geothermal HVAC will continue on higher-end residences but at a reduced volume due to the elimination of the tax credit.

→**Light Commercial**—Growing light commercial installations include variable frequency drives, VRV/VRF mini splits and communicating controls.

→**Tech Education**—There will always be manufacturer update classes with some limited hands-on training, but the vast majority will transition towards web-based training.

Wes Taylor, CMS, Consultant, Mechanical Systems Consultant, LLC:

→**Supermarket Refrigeration**—Large supermarket chains that want to look "green" are seeking new and mysterious systems that reduce operation costs. They often forget that the main goal is to refrigerate and preserve food, but they are seeking so many bells and whistles that it outstrips the attained knowledge of the servicing technician.

The result has been a plethora of experimental systems emerging from the floors of the rack and case manufacturers. Large supermarket chains have already tried a lot of them, but the technical staff of the big box stores seem to be totally in the dark on the maintenance and understanding of the new and trendy products.

→**HVACR Training**—Public institutions that offer career and technical college educations seem to be wholly inadequate to produce well-trained technicians. There is an institution in Atlanta that offers effective training, but where are the others?

→**A/C and Building Automation Education**—Building Automation education looks to be on the rise. There are four leading facilities popping up in that field, in Wisconsin, Maryland, on the West Coast and in Atlanta.

The apparent reason for the sparse quantity may well be the very high expense of a well-equipped lab. Professional associations relating to and supporting such facilities include the Association of Controls Professionals' (ACP) Building Efficiency for a Sustainable Tomorrow (BEST) and the National Science Foundation (NSF). Having toured one of those establishments, I was dumfounded at the complexity of the facility. The miniature functional systems of every variety controlled by an array of specific controls tied to individual learning stations with extensive computers made clear the costs of those institutions.

→**Residential/Light Commercial A/C**—We will see a plethora of refrigerant products and lubricants available to the market. The technician arriving on a job has to wonder what was admitted to the system and what "refrigerant" was approved by the component manufacturer in the system. What to do in the midst of following the EPA guidelines and safety of the attending technician? There is a dearth of fluids being utilized in systems with cost the prime, and in some cases, the only consideration. That has led to issues like an explosion with the building being literally blown off of the foundation and an individual being severely burned. The result was a lawsuit against the facility owners, the technician and the refrigerant manufacturer.