Air Raid

With energy costs on the rise, recent efforts from both not-for-profit industry organizations like ASHRAE, as well as HVAC/R equipment manufacturers, have helped create facelifts for some of the industry's oldest, most operationally critical equipment.

Founded in 1894, ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) is an international organization of 55,000 volunteer members. The group describes its mission as the advancement of heating, ventilation, air conditioning, and refrigeration “to serve humanity and promote a sustainable world through research, standards writing, publishing and continuing education.”

According to the organization, “ASHRAE helps policymakers address the institutional, political and regulatory barriers that can prevent the market from obtaining cost-effective energy efficiency.”

Efforts Towards Improvement

Specifically ASHRAE—with 119 standards and guidelines that establish recommended design and operation practice—is one of only five standards-developing organizations in the U.S. that can self-certify that its standards have followed American National Standards Institute’s (ANSI) standards development procedures.

In addition, ASHRAE's research program, established in 1912, supports 69 research projects with a combined value of more than $8 million. Research focus includes energy and resource efficiency, indoor environmental quality, design and operation and management tools, alternative technologies, and materials and equipment.

Recent efforts have included:

- The Advanced Energy Design Guide Series: In 2005, ASHRAE began producing a series of publications known as the Advanced Energy Design Guides. Application of the recommendations in the series should result in 30 percent energy savings when compared to the same buildings designed to meet minimum code requirements.
- Federal law mandates ANSI/ASHRAE/IESNA Standard 90.1 as the basis for state energy codes. ASHRAE is currently working towards improving energy efficiency by 30 percent relative to the current standard by 2010.
- ASHRAE GreenGuide: The ASHRAE GreenGuide was published by the Society in 2003, with an updated version released in Fall, 2006. The book addresses architectural design impacts, conceptual engineering design, space thermal/comfort delivery systems, energy distribution systems, energy conservation systems, energy/water sources, lighting systems, plumbing, and fire protection systems and controls. It also features a special section on LEED, as well as some 30 ASHRAE GreenTips, which are sidebars containing information on techniques, processes, measures, or systems.

The Technology Response

From a product development and manufacturing side, companies like Thomas & Betts have been improving energy efficiency in HVAC equipment over the past sixty years. One of the typical hurdles to overcome when promoting these new energy efficient technologies is the relative comfort level some manufacturers have with their existing equipment. "That is a very difficult thing to overcome," says John Pas, Product Manager, Thomas & Betts. "Some customers say 'I've had these units in my warehouse for 15 years and I haven't had any problems with them so I want to buy the exact same thing.'
"Sometimes they're leery of the newer technology. That's where you have to actually sit down and do the calculations to show what their savings are going to be."

The ROI Calculator

"Usually—depending on the industry—the heating costs (fuel costs) are the largest expense they'd have in operating a building," says Pas. "For instance, say you have a warehouse, which needs to be heated. There's no assembly line in there; all you're doing is storing product and moving it in and out, so you have virtually no costs as far as machinery goes, but it still costs to heat that building to keep the fire protection system from freezing or to avoid damaging the stored products.

“Or take a manufacturing facility with assembly and production equipment, for example: The heating loads may go up to keep people more comfortable, but the costs become smaller as a percentage of the total operational costs, but it is still an area that is ripe for improvement.

“We have tools available on our website that make it easy to run the numbers and, based upon the particulars of their building, calculate both heat losses and energy usage. Take those calculated heat losses and put them in an energy calculator. There you can compare specific units—say they have older gravity vent style units that are 75 to 80 percent efficient; it’s probably 15 year-old technology,” continues Pas. “So they’re got 80 percent efficient gravity vented units (best case)—plug that into the calculator and it will tell you what your calculated heat costs are going to be for that specific building. Then you can pick higher efficiency units, and it will tell you what your calculated heat costs are going to be with that. In some cases, you can show users that they will save $20,000 to $40,000 in heating costs in a year. With these types of numbers, smart building owners are considering these newer technologies.”

The Rebate Question

In addition, says Pas, many gas and power companies are providing rebates back to building owners for buying energy efficient units—meaning, they can actually get some of the purchase cost of the hardware subsidized by the local energy companies. “More and more companies are becoming aware of these opportunities. Some of our agents are actually working with the local power companies to get these rebates put into place,” he says.

Integration Of Future HVAC

“There are more arenas that people are getting into now,” says Pas. “With today’s energy and health conscious society, standards are requiring makeup air for buildings based on their occupancies. There are changes happening in ventilation and makeup air equipment, so we’re looking to see higher efficiencies and alternate technology. Thomas & Betts just came out with a high efficiency indoor packaged unit for makeup or ventilation air.

“There is also energy recovery,” Pas explains. “Companies are using the exhausted air from the building and running it across an air to air heat exchanger, where you extract the heat out of that exhausted air and put it back into the building. It’s probably logical that with today’s move towards greener technology, energy recovery will be mandated at some point in time. So, while we may be hitting the limit as far as combustion efficiency is concerned, there are future technologies being explored every day by the HVAC industry.”

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