

Small Leaks Lead to Big Costs

When it comes to energy efficiency, the dollars are in the details. And those details can be easily overlooked, especially when multiple small system leaks start to add up in a large facility.

System leaks of any kind can represent small efficiency gaps that can place a big drain on efficiency. An individual leak might not seem overly costly, but taken as a whole they can add up quickly.

Two words should be on the lips of every facility owner when it comes to saving money in operating costs: efficiency and implementation.

Keith Nienhaus, project manager at Hixon Architecture, Engineering, Interiors, recommended a variety of energy-savings costs during a recent

“If the leak is even bigger, say a solenoid valve that’s not closing, that cost can really climb.”

Compressed air leaks should also be regularly monitored, Nienhaus added. He pointed out that the average facility has up to five percent of its compressed air usage coming from leaks in the system. The issue is especially costly on weekends when production is low, yet leaks cause air compressors to work overtime in order to maintain system pressure.

Nienhaus said it’s important to pay special attention to water leaks. Water leaks are particularly costly, because in addition to paying for the cost of incoming water, a facility is also being hit with the expense for wastewater, he said. Compounding the problem, water that



Even a microscopic 1/32-inch pinhole leak can cost \$150 per year, which doesn’t sound like much unless you consider there could be dozens of such leaks in a facility.

webinar hosted by Food Engineering Magazine entitled “Saving Energy Without a Capitol Investment.”

One of his suggestions was to search for those money-draining leaks, which can appear throughout the facility on a number of systems. “It can be due to [many] factors,” he said. “Pinhole leaks, excessive bleed off, faulty solenoids [not closing completely] or even poorly seated flange connections.”

And those kinds of small leaks are a certain way to bleed money. Even a microscopic 1/32-inch pinhole leak can cost \$150 per year, which doesn’t sound like much unless you consider there could be dozens of such leaks in a facility. Steam leaks, most commonly found with steam traps, waste approximately \$1,500 per year for each leaking steam trap. A water leak will drain up to two gallons per minute, which translates into 130,000 gallons in 60 days.

“If leaks go unchecked, they can really grow on you,” Nienhaus said.

leaks onto a hot water system will waste all the energy used to heat the water.

The implementation of a maintenance and repair program for system leaks is critical for all utility systems. Nienhaus suggests regularly monitoring all piping valves and equipment. Because large facilities include so many systems, that task can seem overwhelming. But Nienhaus said, “It’s important to stay on top of it. It should be done on a routine basis, because you probably are not going to get through everything in one day.”

He points out that one facility traced down every foot of pipe and inspected every piece of equipment. The result of their due diligence was to reduce leaks to five percent of system capacity. “Now the trick is to make sure to remain at that level,” Nienhaus said. “It should be an ongoing effort. Once you fix all the leaks, if you start ignoring everything, [they] will probably resurface.”

Another important step toward reducing costs is through the maintenance and repair of insulation. All hot and cold piping, valves, equipment and ancillary components should be properly insulated and regularly monitored for damage. Damaged insulation allows moisture into the system, which will spread.

Each 100-foot section of pipe not insulated means \$1,500 per year in heat loss. “Just because a pipe is still able to run the system doesn’t mean you should ignore damage to the insulation,” Nienhaus said.

Nienhaus recommends insulating new piping when installed and also insulating long runs of existing piping if needed. “That requires additional capitol but the payback is relatively short,” he said.

For more generalized leaks, there are a number of obvious ways to save money and become more efficient. One of the easiest is by checking that doors fit tightly and are appropriately sealed. That includes overhead doors, sliding doors and all entryways to coolers and freezers.

Dock doors are the first line of defense for keeping ambient air from infiltrating the facility, he said. Poor seals will cause extra load on the refrigeration system. It’s also important to caulk and seal any gaps in the building envelope, especially at pipe and conduit penetrations.

Finally, a clean system is a happy system. Dirty equipment lowers efficiency, mainly via buildup that reduces the amount of air flow through the condenser. “A regular schedule of system maintenance and cleaning will improve your bottom line,” Nienhaus said. ■