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Understanding Electrical Systems at Your Facility

Maintenance How To Articles

By:

Matt Alderton

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Facility managers are used to talking about energy. Back when “green” was just another color, many of them already were installing upgraded HVAC systems, low-flow toilets and fuel-efficient boilers.

Facility managers normally focus on heating, cooling and plumbing, and often do not consider narrowing their conversation from energy in general to electricity in particular, suggests former facility manager Carolyn Sarno, who is now a senior program manager for the Northeast Energy Efficiency Partnerships (NEEP), a Lexington, Mass.-based nonprofit that facilitates regional partnerships to advance the efficient use of energy in homes, buildings and industry.

According to Sarno, many commercial buildings spend more than \$1 million per year on electricity. So cutting their electric bill by just 10 percent could save facility managers as much as \$100,000 a year, which they could use to hire new maintenance staff, upgrade their facilities or invest in renewable energy sources like photovoltaic systems and wind turbines, which could save the facility even more money.

Understanding electricity

To save money and lower electricity consumption, facility managers must first understand electrical systems.

The best way to gain that understanding, according to Sarno, is by getting a Building Operator Certification (BOC). “Part of BOC training is ‘Electrical Systems 101,’” she says, adding that many utility providers offer BOC tuition scholarships to their commercial clients. “You learn what electricity is and how it works, and you learn a comprehensive approach for managing your buildings.”

Learning about circuit breakers and transformers can help facility managers fine-tune their building knowledge. Because energy efficiency is more about energy consumption than energy delivery, however, facility managers are likely to accomplish more by studying what plugs into the wall than they are by studying what, exactly, it plugs into.

“If you want to save energy, you have to look at controlling the consumption of devices when they’re plugged in,” says Gus Ezcurra, CEO of Advanced Telemetry, a San Diego-based energy management firm. “Awareness of consumption is the key to saving electricity.”

Track your targets

Sarno agrees with Ezcurra. “You’ve got to develop an energy management plan so that you can track and measure your utility data,” she says, adding that because facility managers typically don’t see their bills—utility bills often go to a clerk or an admin person, instead—step one is looking at your bills and watching for trends. “You can track your electricity usage very easily in a spreadsheet and look for anomalies over time. There are programs out there that will even track and manage your bills for you, then automatically e-mail you when there’s a spike.”

Looking at your utility bills is the easiest and most affordable way to track consumption, but not always the most reliable, as power-bill information often is 45 to 60 days old. This makes isolating and explaining specific reasons for spikes difficult.

For that reason, Ezcurra recommends installing a special digital energy meter that facility managers can use to track consumption in real time, either on site or remotely via PDA. “The best way to achieve energy efficiency is to monitor your consumption in as close to real time as possible,” he says.

Eliminating wasted energy

If step one is tracking consumption, step two is lowering it, suggests Sarno, who says a good, achievable goal is to reduce one’s electricity consumption by 10 percent in the first year.

To do exactly that, Sarno offers the following tips:

- *Target “phantom” loads:* Facility managers should recommend building tenants unplug devices, such as toasters, copiers and computers, at the end of the day to eliminate the “phantom” power these electronics draw even when in “sleep” mode.
- *Prioritize preventative maintenance:* Facility managers should perform regular preventative maintenance on their building systems, according to Sarno, and should consider hiring a firm to perform retro-commissioning on your facility in pursuit of high-efficiency operations.
- *Ask for help:* Many utility companies offer complimentary energy-efficiency consulting, and some will even help commercial buildings upgrade their least efficient equipment.
- *Perform regular “energy drills”:* Perform annual energy drills—like a fire drill—to teach tenants about electricity consumption and reduction.
- *Automate as much as possible:* Rather than rely on tenants to turn lights and devices off, facility managers should invest in smart power strips and building automation systems that automatically turn off lights, computers and more after hours.

