ASK RUSS

For October 2015

by Russ Simons | *Published: October 1, 2015*

Text Size

What do public assembly facility operations professionals need to know about “Vampire Loads”?

Vampire loads, also known as “Phantom Loads” or “Plug-Loads,” are coming to the attention of facility operators of all venue types.

A Plug-Load is stand-by energy used by products that are powered by means of an ordinary AC plug (e.g., 100, 115, or 230 V) that is switched off. This generally excludes building energy that is attributed to major end uses (HVAC, lighting, water heating, etc.). It has been reported that the percentage of energy use from plug-loads is increasing. Plug loads are some of the fastest growing sources of energy use in commercial buildings today. In offices, they count for 15-20 percent of electricity use. In offices that have already addressed and improved their energy efficiency, they can account for up to 50 percent of the electrical cost.

Plug and Process Loads (PPL’s) account for 33 percent of U.S. commercial building energy consumption. The remaining 66 percent is found in overhead lighting and HVAC systems.

The introduction of Building Automation Systems (BAS) and a commitment to understanding and utilizing the data available to facility operators has led us to make great strides in managing the energy and efficiency of major systems in public assembly facilities. In understanding the large-scale electricity costs in our facilities, it became clear that this previously ignored electrical usage was playing a much larger role in our usage and cost than previously thought.

According to the U.S. Department of Energy, office equipment consumes nearly 7 percent of commercial electricity, costing commercial buildings across the country approximately $1.8 billion dollars each year.

The sources of these loads are devices, which still use electricity even when they are turned off. In fact, any electrical device with an external power supply connected to it will still use electricity. Examples include computers & monitors, radio chargers, TVs, copiers, fax machines (I know right now you are saying what the heck is a fax machine), coffee makers, printers, refrigerators, icemakers, microwaves, etc.

In the state of California, plug-loads consume at least 3,000 gigawatt hours annually (a gigawatt is equal to 1 billion watts, a watt measures the amount of work electricity does in one second) costing Californian’s over $400 million per year.

California is one of six states, along with the city of Seattle among others that currently have adopted regulations that address the need to manage plug-loads.

ASHRAE Weighs In

ASHRAE 90.1-2010 targets the local receptacle, attempting to reduce the ever-growing “vampire” plug loads both during downtime and after hours.

120-V outlets: Fifty percent of 120-V outlets that serve private offices, open offices, and computer classrooms must be provided with automatic receptacle control. Buildings are encouraged to put parasitic loads (i.e., printers, chargers, heaters, etc.) on half of the outlets so they can be switched off with occupancy, as plug-in loads can account for 15-50 percent of a building’s electricity. To reach the next level of performance, efficiency requirements must trickle down to building inhabitants and their behaviors.

Many energy codes now require Receptacle Control or Plug Load Control. Both ASHRAE 90.1-2010 and California Title 24 2013 require controlled receptacles to have the same automatic shutoff function as lighting using either occupancy sensing or schedule based control. Plug-in strips and devices cannot be used for code compliance. Title 24 and NEC also require the controlled receptacles to be permanently marked to differentiate them from uncontrolled receptacles. Occupancy Sensing Based Receptacle Controls are electrical plugs that monitor a space’s state of occupancy and will energize and de-energize a controlled receptacle based on occupancy.

What can you do?

When it comes to energy reduction, the best rule of thumb is to simply turn off or unplug equipment when it’s not in use.

One way to make it easier to power down is to use an advanced plug strip or occupancy sensing plugs.

Load-sensing plug strips use a master/slave approach. They can be set so that when you turn off your computer, everything else in the plug strip also turns off.

Occupancy-sensing plugs detect the presence or absence of a user and automatically turn equipment on and off in response.

The Bottom Line

Vampire loads can make up a significant
portion of a facility’s total energy use. For institutions concerned with their environmental impact, plug-load consumption of new and existing buildings must be considered, especially when it comes to vampire energy loss. As mentioned above, there are solutions to these problems that can make a big impact environmentally and financially on your bottom line.

Russ Simons is...

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