

# New Technologies Provide Options for Making Escalators More Energy Efficient

by John Hurst

Everyone knows that reducing energy consumption has become a priority for the U.S. Many new methods of reducing electricity are being considered, including new technologies for escalators. Legislation regarding energy-saving technologies has been discussed as recently as a year ago, and with the recent change in political power in Washington, such proposals are likely to arise again.

In general, there are three alternatives to reduce escalator energy consumption:

- ◆ Turn the escalator off.
- ◆ Make all escalators "intermittent-run escalators" by installing a variable-frequency drive and numerous sensors to reduce the speed of the escalator when no one is on it.
- ◆ Install a specially designed energy-saving soft start, such as the one manufactured by Power Efficiency Corp. This technology leaves the speed of the escalator unchanged, but reduces the power it consumes when fewer people are on it.

Approximately 355,000 escalators were in operation worldwide in 2005. According to U.S. Representative Louise Slaughter (D-NY), who in 2005 proposed that all

escalators in the U.S. should run intermittently: "Escalators are used more than 90 billion times a year in the U.S. The amount of energy consumed by their continuous operation is the equivalent of powering 375,000 homes. The energy cost to the nation is around US\$260 million per year." Congresswoman Slaughter estimates that replacing all of the nation's escalators with intermittent escalators would save the country US\$104-130 million per year. With increasing calls for national energy independence, proposals such as Congresswoman Slaughter's may come back to the forefront.

According to U.S. Representative Shelley Berkeley (D-NV), a congressional leader on alternative and renewable energy matters, "Expanding renewable energy sources, increasing energy efficiency and rewarding conservation must all be a part of the solution."

So what options do we really have for saving energy on escalators?

The first option that comes to mind is that low-tech solution: the power switch. There's no denying that the best way to save energy is to shut off the escalator. On the other hand, an escalator that doesn't move is really just a very expensive set of stairs. In fact, safety codes in a number of jurisdictions require that non-functioning escalators be blocked off – so that brand-new set of high-tech stairs wouldn't even be usable.

*Continued*

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Intermittent-run escalators are another option. Equipped with a variable-frequency drive (VFD) and numerous sensors, intermittent escalators slow down or stop when no one is using them and speed up when a rider appears. By slowing or stopping the electric motor driving the escalator, energy is saved. However, there are several problems with intermittent-run escalators. First, retrofitting an escalator to run intermittently or replacing it with a new intermittent-run escalator is expensive. The equipment required includes a VFD, sensors for incoming passengers and enough room for a corridor (or a gate/turnstile) to prevent passengers from stepping on the escalator before it is up to full speed. According to the National Institute of Building Sciences' GSA Intermittent Escalator Study, the design, construction and equipment costs range from US\$15,000-32,000 per escalator. Second, changing an escalator's speed increases potential liabilities for escalator manufacturers and property owners, due to the increased potential for individuals to fall and blame the escalator for changing speeds. The last problem with intermittently operated escalators is that they do not presently meet U.S. safety codes. All escalators in the U.S. should be manufactured and installed in compliance with ASME A17.

This leaves Power Efficiency's soft start, an energy-saving device that leaves the speed of the escalator

unchanged but reduces the power used by the escalator when fewer riders are on it. The device incorporates a solid-state soft starter with patented energy-saving technology that constantly monitors the workload of the motor. The technology matches the voltage to the motor load in order to supply the precise amount of energy required to maintain the escalator at normal operating speed. Power Efficiency's soft start is privately labeled by major elevator and escalator manufacturers.

In a recent test by Nevada Power Co., the electric utility for southern Nevada, on an escalator motor at a major Las Vegas casino, Power Efficiency's technology reduced average power consumption by 33%. The device meets U.S. safety codes, is CSA B44.1/ASME A17.5 certified and is CE certified for sales in Europe.

In early 2007, Power Efficiency will release a new version, which can be installed in place of a starter inside the escalator control box. Smaller and equipped with auto-adjusting energy savings, the next-generation product will ultimately include such features as load-profile monitoring and reporting capability, remote-monitoring capability and full intelligent software control to monitor soft start, shutdown and energy savings. The product is also being designed to save energy on motor-generator-set elevators. Power Efficiency ([www.powerefficiencycorp.com](http://www.powerefficiencycorp.com)) is headquartered in Las Vegas. 

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