

Load-Shedding Ballast System Demonstration

Electric utilities often face periods of peak demand that exceed available supplies, especially during the summer. This can result in blackouts that can affect entire regions of the United States.

LRC researchers have developed a prototype for a new lighting control system that allows electricity customers to reduce their monthly utility bills by controlling their own peak demand.

Demonstration

To demonstrate this new system, the LRC installed 150 special load-shedding ballasts at Consolidated Edison's division headquarters in Rye, N.Y. The ballasts, manufactured by OSRAM SYLVANIA, are a modification of the LRC's original design. They respond to a signal sent by the utility or the customer's energy management system, reducing power to the lighting by one-third.

Earlier lamp life tests and human factors studies at the LRC concluded that dimming lighting by one third does not affect lamp life and is acceptable to most building occupants.



ConEd headquarters in Rye, New York (demonstration site)

Load-shedding ballasts installed in ceiling fixtures



Office Lighting Levels with Load-shedding Ballasts

Power reduced from 85 W to 56 W (34.1 percent)

Area	Illuminance (footcandles) Load Shed Off	Illuminance (footcandles) Load Shed On	Percent Decrease
Exterior private office SE exposure (shades open)	99.4	67.7	31.9
Interior private office	75.5	48.3	36.0
Open office 12 feet from window SW window (shades open)	79.3	58.8	25.9
Interior hallway	16.6	11.5	30.7

Sponsors

New York State Energy Research and Development Authority

Consolidated Edison

OSRAM SYLVANIA

Behind the Technology

The design of the system is based on common instant-start ballast technology already used in nearly 80 percent of commercial lighting installations. A signal injector on the building's lighting circuits controls the ballasts, eliminating the need for extra wiring.

Results

The new load-shedding system offers an alternative to costly and highly polluting peak power generation. It can reduce power consumption immediately and predictably in response to peak demand alerts.

The system will pay for itself in as little as six months for new construction projects within New York City. Elsewhere, payback is expected to take about three years.

A survey conducted after the ballasts were installed indicated that most of the building's occupants did not believe the dimmed lights affected their productivity.



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Lighting
Research Center