

Dimming Ballasts: As Good as We Think?

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Background Information

SMUD's Customer Advanced Technologies Program

Mission: "Work with researchers, customers, and others to develop, test, evaluate and promote new and underutilized energy efficiency technologies."



What if?

You finally convinced your CEO to invest in a state-of-the art lighting control system, and told her that the system would reduce lighting energy consumption by 50%...

but the actual savings were only 30%?

What if?

You initiated a demand response signal to reduce lighting energy consumption by 25%, and...

nothing happened?

Intel Project

- Retrofitted 1,048 fluorescent troffers with dimmable ballasts and Enlighted controls
- T8 fluorescent lamps
- Full range dimmable ballasts (100 to 3%) with 0-10Vdc input
- Task tuning set for 70% maximum output
- Daylight harvesting in perimeter zones
- Occupancy sensors set for bi-level operation



Project Results

- Savings were lower than expected despite multiple attempts to correct.
- Actual problem was not the control system...



... it was the ballasts!



Problems at the Top End...



Light Output

Problems in the Middle...



Problems at the Lower End too...



Light Output

What About Other Ballast Manufacturers?

ADM's mission: obtain performance data for 0-10Vdc dimmable ballasts from all major manufacturers



Power Curves for 0-10Vdc Ballasts Show Consistent Gaps



Serious Issue for Demand Response



SMUD Dimming ballast report: <u>https://www.smud.org/en/business/save-</u> energy/rebates-incentives-financing/customer-advanced-technologies.htm

Some Tips

- Ask ballast manufacturers to provide performance information.
- Demand response: watch out for ballasts with dead bands in the top end of the spectrum.
- Avoid cathode heating set points when choosing task tuning set points.
- Turn off ballasts at lower end of operation.

Also...

Read our white paper Read our ballast and project reports

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