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…

Power consumption at 90% output is the same as 100%
Problems in the Middle…

Power consumption at 70% output was higher than at 76%
Problems at the Lower End too…

Power consumption at 3% output is about 15% of max.
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


Note: no change in power consumption from 7.5 to 10Vdc
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

SMUD Dimming ballast report:
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