Do luminaire level lighting controls live up to their promise?

Slipstream evaluated ENERGY SAVINGS, COST, AND OCCUPANT AND OPERATOR SATISFACTION of the Cree SmartCast lighting system. This system integrates occupancy and photosensor controls into each fixture, and also includes task tuning.

**PROBLEM**

Lighting retrofits traditionally focus on LEDs without controls.

We tested the system BY REPLACING THE FLUORESCENT SYSTEMS IN THREE DEPARTMENT OF DEFENSE OFFICE BUILDINGS at two Air National Guard Bases.

**RESULTS**

**ENERGY SAVINGS: 69% OF LIGHTING ENERGY, 2.5 kWh/ft²**

Through analyzing the daily profiles across each space, we calculated that 48% of the energy savings was attributable to the switch to LEDs. THE REMAINING WAS FROM THE CONTROLS; 9% from tuning light levels, 3% from occupancy and 9% from daylighting.

Note that savings would be different in spaces with more variable occupancy or different daylight availability.

**COST SAVINGS: UTILITY BILL SAVINGS: $0.42/ft²**

However, cost effectiveness for demonstration project remains challenging.

20-year simple payback.

Other demonstration projects show more favorable economics (approaching 8 years). Trend is continued reduction in cost, which will continue to improve economics.

**OCCUPANT SATISFACTION**

The results of our occupant satisfaction survey have been overwhelmingly positive, even with the overall light levels generally being reduced. Here are the pre- and post-retrofit results when we asked how satisfied occupants were with their light levels.

- **PRE-RETROFIT**
  - Extremely satisfied: 13%
  - Somewhat satisfied: 22%
  - Neither satisfied nor dissatisfied: 17%
  - Somewhat dissatisfied: 5%
  - Extremely dissatisfied: 4%

- **POST-RETROFIT**
  - Extremely satisfied: 61%
  - Somewhat satisfied: 39%
  - Neither satisfied nor dissatisfied: 4%
  - Somewhat dissatisfied: 4%
  - Extremely dissatisfied: 4%

Overall score improved from 2.5 to 18 (1 = Extremely satisfied, 5 = Extremely dissatisfied)

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