LCF
LIGHTING
CALIFORNIA'S FUTURE

Retrofit Integrated Classroom Lighting System

Marc McMillan – Finelite

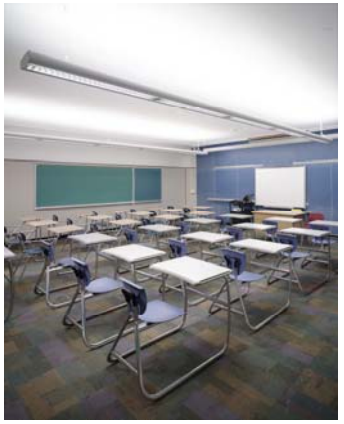
Wes Morgan - CLTC

October 10, 2007

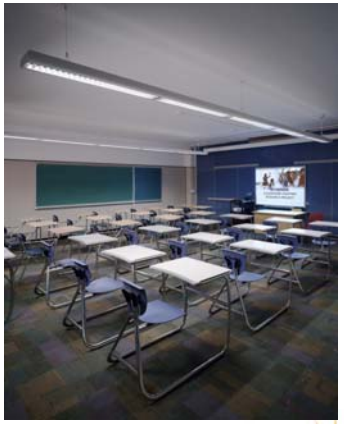
PIER
PUBLIC INTEREST ENERGY RESEARCH
"Research Powers the Future"

Goals

- Bring the benefits of the ICLS system to the retrofit market.
  - Meet the needs of today's teaching methodology.
  - Use an integrated system that meets CHPS and LEED standards for classroom lighting
    - General & AV Modes
    - Whiteboard illumination
    - Teacher Controls
    - Ease of installation
    - Integrated occupancy and daylight sensors.



General Mode



Audiovisual Mode

Goals

- Deliver energy savings that is 20% better than Title 24
- Provide the functionality needed for today's teaching technology.
- Develop "Good", "Better" and "Best" solutions to meet different payback requirements.
  - Good: De-lamp existing luminaires where possible, perhaps change reflector.
  - Better: retrofit luminaires with new optics and lamps. Add a whiteboard luminaire, and teacher controls.
  - Best: Assumes project where the ceiling will be changed\breached and thus justifying the use of pendant ICLS system
- Install and test different solutions in real world classrooms and monitor usage and energy performance.

Current Activities

- Team Development
  - Addition of EE to Finelite engineering team
- Market Research
  - Currently surveying the retrofit marketplace
  - Understanding the wireless controls
- Product Development - Better
    - Recessed luminaire currently being developed
    - Using high-efficiency 96% reflective matte white paint
    - Lamps are positioned below the ceiling plane to achieve high quality light distribution typical in indirect luminaires
    - Luminaire performance looks extremely promising

Planned Demonstrations

- 15 Demonstration Sites
  - Will split up sites between Good and Better
  - “Best” will be the current ICLS pendant indirect/direct system. Enough data exists.

Input

- Luminaire Cost
  - The challenge is understanding the cost targets for the systems.
- Installation Cost
  - How do we keep contractor costs low?
- Lighting Uniformity and performance
  - Are we willing to be flexible with performance?
  - Will we need to create a new best practice for retrofit?