Lighting Energy Conservation in Army Barracks….and Other Facilities

Templates for Lighting System Efficiency Improvements

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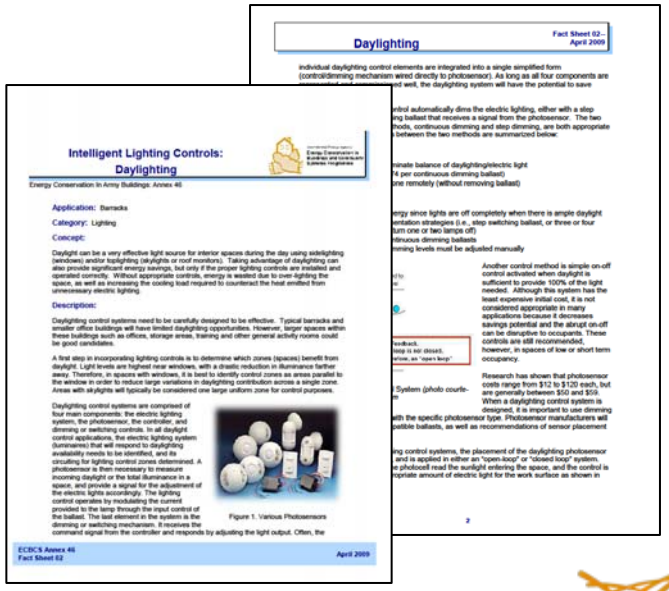
Templates for Lighting Efficiency

- Templates developed for specific lighting opportunities
- Focused on Barracks but can be applied to other facilities
- From relatively simple retrofits to more complex issues
- Include energy savings calculation guidance
- Provide practical application guidance
- Five topics covered:
  - Incandescent to CFL retrofits
  - Occupancy Sensors
  - Daylighting control
  - Exterior lighting control
  - Retrofitting to correct light levels



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Incandescent to CFL Retrofits

Common retrofit…."been doing it for years"….but….

- Color – wide variety in CFL technology compared to Inc.
- Output/intensity – CFL is not a point source!
  - May not be effective for highlighting (hard to focus a beam)
  - Still need to check output compared to incandescent
- Hardwired vs. screw-in. Initial cost vs. "takeback" loss
- Environmental issues beyond simple incandescent
  - Mercury
  - Additional components/mass
- Heat – excessive heat can degrade performance
  - Avoid enclosed recessed applications
  - Check manufacturer's listed applications

Effective Occupancy Sensor Lighting Control

- Occupancy sensing….but with a focus on “effective”
- The right technology
  - Infrared – “sees motion” – not as good with obstructions
  - Ultrasonic – “feels motion” – will sense everywhere
  - Hybrid for better control
- The right location/installation
  - Check area limit
  - Watch obstructions and occupant patterns
- Maximize energy savings settings
  - Sensitivity
  - Timer
  - Consider “manual-on” technology

Effective (Intelligent) Daylighting Control

The Sun can look real simple…..Daylighting control is not!

Daylighting design issues:

- Continuous vs. Step dimming
- Open vs. Closed loop control
- Glare issues…..side and top lighting
- Individual space design elements:
  - window size and location
  - Building orientation
  - Window type

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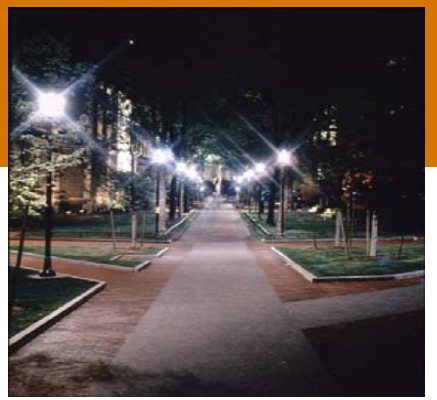
Exterior Lighting Control



Going beyond the photocell or timeclock…..

- Start with photocell or timeclock control….then consider:
- Photocell (dawn to dusk) **+** timeclock for after closing
- Occupancy sensing where (technology) appropriate
  - Switching
  - Dimming
- Address safety concerns - Light quantity is NOT the sole metric of safety/security

Retrofitting to the Correct Lighting Levels

"***We have over time, overlighted everything in America***", Howard Brandston

- Identify lighting needs based on space type and function
- Follow measurement protocols for verifying light levels
- Application Technologies – many options
  - Better technology - replace older T12/T8 with newer lamps and ballasts
  - Replace standard with low factor ballasts
  - Complete new system
- Develop retrofit strategies – user acceptance planning
  - "don't take my light away" - avoid de-lamping
  - Provide "new, better lighting" that "meets guidelines"

- Questions?
- Suggestions?