

“Going Beyond T8’s”

NAESCO

San Francisco Regional Meeting

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NAESCO



Daylight Harvesting & Controls

■ Why

Lighting comprises 24% of California's connected load

Power Utilities are at max capacity

New generation for peak loading too costly

New rate structures are coming – ALL customers >150kW
can expect exposure to some form of real-time pricing



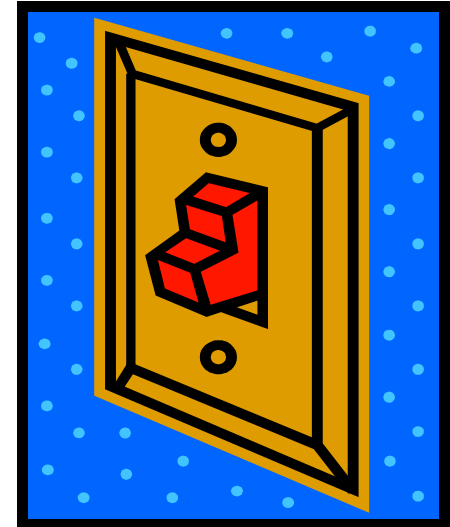
■ Market Drivers

Title 24 Code – 'BigBox' buildings >25,000 sq.ft. under roof with >15 ft. ceilings, and with lighting power density of >0.5W/sq.ft.

Peak-load Mgt - California is seeking solutions for 441MW of controllable load this year...and larger load targets in '07, '08 and beyond

Traditional Options Switching To Reduce Load???

- A/B Switching – Turning off every other light fixture or row requires additional wiring
 - Must be planned as part of initial installation
 - Can be difficult to retrofit
- Controllable Breakers or Relay Panel Switching scheme turns all lights off
 - Must be planned as part of initial installation
 - Hard to retrofit
 - Driven by time-clock or integrated with Bldg Automation System



Traditional Options

How About Switching Part of Each Fixture???

- California Title 24 requires some type of partial lighting switching
- Added cost for wiring and additional ballasts
- Still a manual system
- “Dark” sections within each fixture (aesthetics)



Traditional Options

Dimming/Controllable Systems

- Install lighting panel reducer
 - Dims rather than turning off the lights
 - Incompatible with self-regulating (active PFC) ballasts
- Install dimming system
 - Added cost for wiring and additional ballasts
 - Lower efficiency system than non-dimming
 - Typical dimming “penalty” is 15-20%
 - Added labor to calibrate photosensors

Where Do We Go From Here?

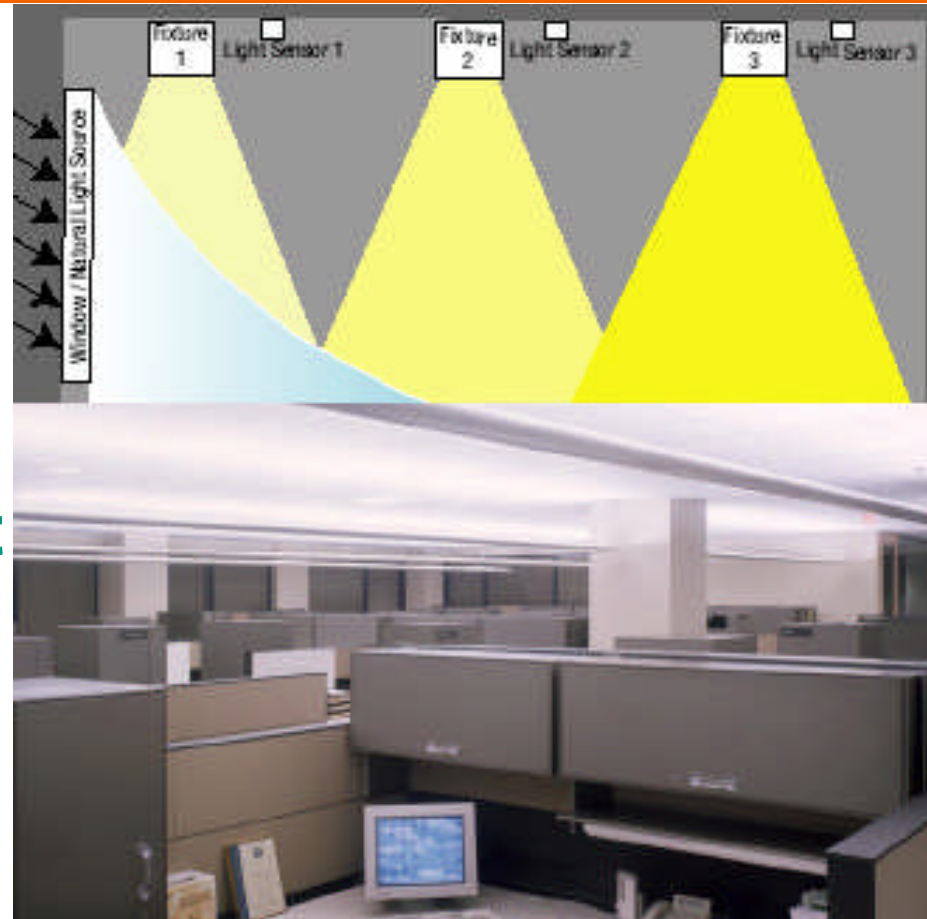
- Daylight Harvesting
- Sensor Technology
- More Efficient Dimming Systems
- Integrated “Systems”
- New Technologies

Daylight Harvesting

Daylight Harvesting

A strategy to reduce artificial illumination by switching or dimming the lighting system

- Sun gets brighter ...
- less power required to light office
- Sun goes behind cloud ...
- more power required to light office



Sensors

■ Passive Infrared Technology

- Senses the difference between heat of a human body and the background space
- Clear line of sight necessary; breaks room down into “zones”

■ Ultrasonic Technology

- The sensors “bounce” ultrasonic waves off of objects in an area (Doppler)
- Motion in the space causes the sound waves to be returned at a different frequency

■ Dual Technology

- Provides better coverage without “false triggers”
- Can allow for greater energy savings

New Options

Dimming/Controllable Systems

- New generation dimming system components address the objections of wiring, efficiency and labor
 - Can utilize powerline controllers
 - Easy to retrofit with no added cost for control wiring
 - Ideal for smaller areas such as conf. room or private office
 - Comparable efficiency to non-dimming ballasts
 - High-efficiency designs with coil cut-off technology
 - e.g. 2-lamp T8 DIM @ 58W
- Integrated lighting “systems”
 - Lamps, Ballasts & Controls
 - Fixture “systems”



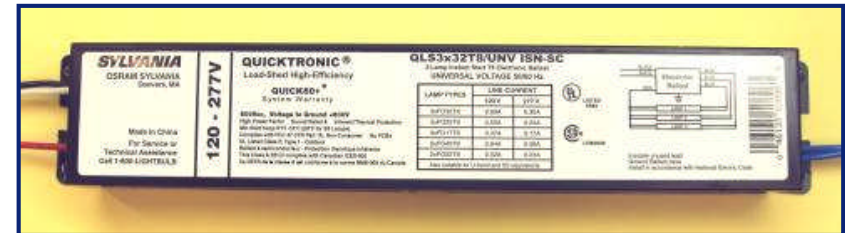
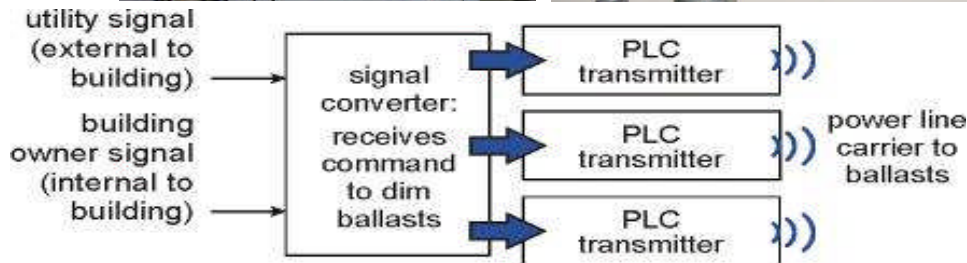
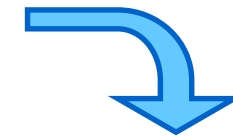
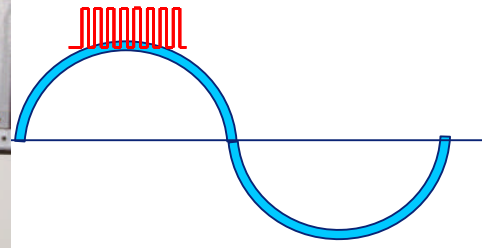
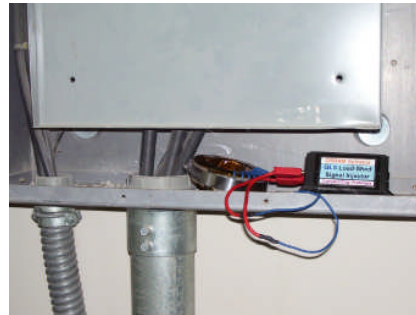
Emerging Options

Loadshed Lighting Systems

- Feasibility of cost-effective demand response technology
 - New York State Energy and Development Authority (NYSERDA) and US Dept. of Energy (DOE) funding effort
 - Lighting Research Center – Program Manager
 - Consolidated Edison – Utility partner & demo site host
 - Intech21 – Controls partner
 - CEC & DOE also sponsoring project with the California Ltg Technology Center for project at UCSB
- Project targets
 - NO Control wires to ballasts & Easy to install
 - High-efficiency ballast
 - Prove reliability & effectiveness of concept
 - Price adder of \$9.00 vs. std ECG

Loadshed Control Architecture


■ Demand Response “Loadshed” system



Simple installation
same as QHE, no control wires

Peak load reduction
33% of I_{tg} pwr – Up to 200hrs/yr




 the system solution®



Loadshed Control Architecture

- Performance example
 - 3-Lamp T8
 - Universal-voltage
 - High-efficiency

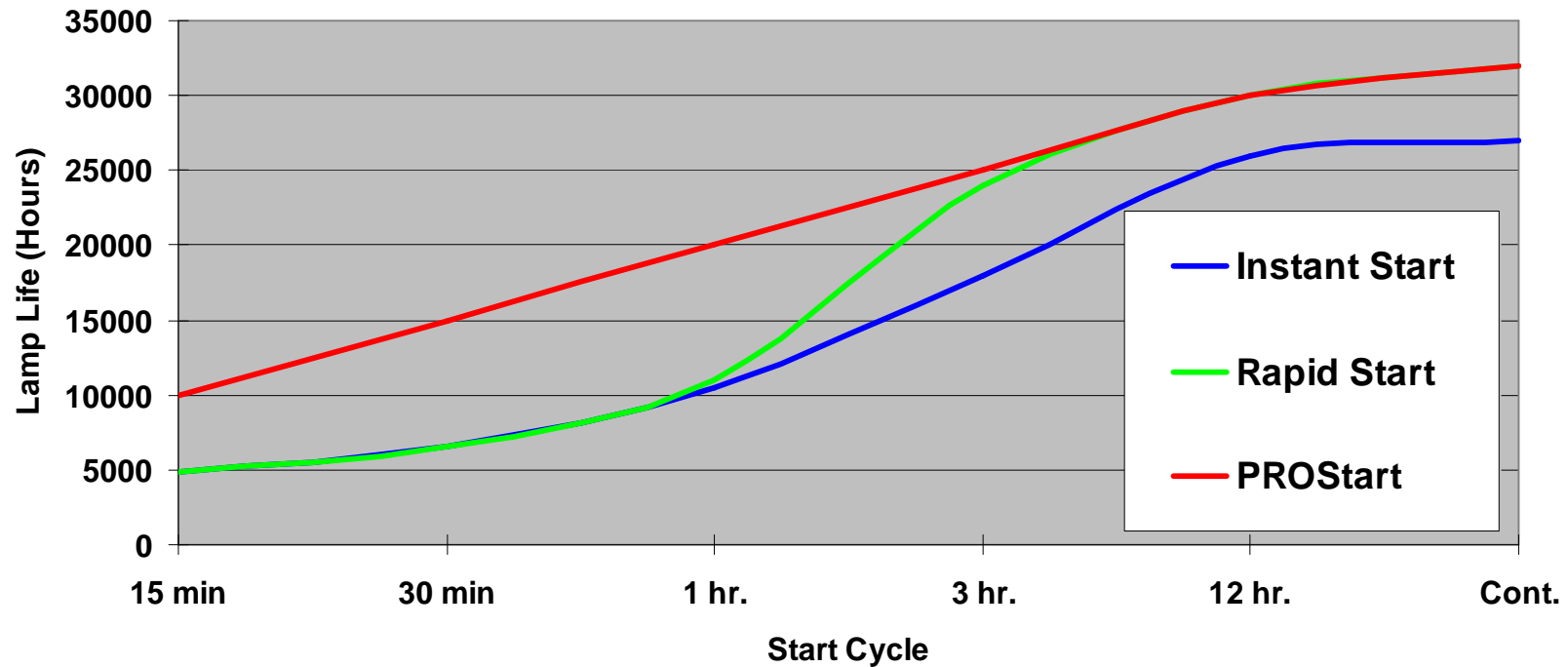


	3x FO32 lamps	3x FO32 lamps, load shed mode
Ein (V)	240.2	240.3
Iin (mA)	348.2	239.7
Pin (W)	83.3	57.2
Percent of nominal input power	100.0	68.7
PF	0.996	0.993
THD (%)	4.9	6.3

Starting Method Comparison

Fluorescent Lamp Life Comparison (standard T8)

(Number of **STARTS** is key, moreso than life of lamp)



QUESTIONS ??????????????

THANK YOU !!!!