ASHRAE Electricity Savings – Elevator Lighting and Ventilation

CEC Pre-rulemaking Workshop, June 12th, 2014

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Pre-rulemaking Workshop: Agenda

• Code Change Overview
• Proposed Code Change Language
• Measure Impacts
• Code Change History
• Summary of Current Code Requirements
• Typical Practices
• Methodology
• Initial Data and Findings
• Stakeholder Meeting Feedback
• Specific Stakeholder Requests
Proposed Code Change Overview

• Elevator Lighting and Ventilation
• Will require elevator cabins to turn off lighting and ventilation when unoccupied for more than 15 minutes.
• Will require all cab lighting systems to have an efficacy greater or equal to 60 lumens per Watt. (ASHRAE 90.1 is only 35 lpW).
• Cab ventilation fans for elevators without air conditioning shall not consume over 0.33 W/cfm at maximum speed.
SECTION 120.16 – MANDATORY REQUIREMENTS FOR COVERED PROCESSES

(e) Requirements for Elevators

For the luminaires in each elevator cab, not including signals and displays, the sum of the lumens divided by the sum of the Watts shall be no less than 60 lumens per Watt.

Cab ventilation fans for elevators without air-conditioning shall not consume over 0.33 W/cfm at maximum speed.

When stopped and unoccupied with doors closed for over 15 minutes, cab interior lighting and ventilation shall be de-energized until required for operation.
• All new construction elevators and retrofits starting 2017

• Will impact all multi-level buildings with elevators.

• Anticipated to be mandatory
This measure is being proposed in order to reduce electricity use in elevators when they are unoccupied, as well as reducing the energy used during operation.

The proposal is from Section 10.4.3 of ASHRAE 90.1 2013.
Current Code Requirements

• There are currently no existing requirements for elevator lighting and ventilation in Title 24.
Typical Practices

• It is already industry standard practice for all new construction elevators to be installed with the sleep mode technology.

• Most older elevators do not have sleep mode or LEDs installed. Most of the savings will result from upgrading older elevators during retrofits that trigger code. (Assumed to be 5% of elevators each year)
Methodology for Savings Analysis

- **Energy and Demand Impacts**
  - Energy savings and Demand Impacts are determined by comparing the energy usage of the proposed conditions to the energy usage of the existing conditions.
  - Lifecycle lighting savings consider the reduced hours of operation & kW reduced from the baseline lamps to LEDs.
  - Ventilation savings are determined by the reduced hours of operation of the fans.
Methodology for Cost Analysis

- Controls cost estimate obtained from RS Means Catalog.

- There is no difference between current cost and post adoption cost, as the technology is already industry standard practice.

- Requesting additional input from stakeholders.
Initial Data and Findings

• Current Assumptions
  – Cost to implement, approx. $1,300
  – Average unoccupied hours per year: 3,504 hours
  – Average lamps per cabin: 9
  – Switching from 20 W Halogen lamps to 3 W LEDs
  – Halogen lamp life: 5,000 hours
  – LED lamp life: 50,000 hours
  – Ventilation fan power: 40 W
  – Useful life of elevators: 20 years
– LED lamp cost: $19.50
– Halogen lamp: $14.95
– Cost of maintenance per lamp: $13.90
– Approximately 1,452 new constructions and 4,344 retrofits in California 2017.
California Estimates

- Elevator installation projections are based on a 2005 study of national projections for the year 2015, and then modified by an estimated growth factor of 1.7% to obtain projections for 2017.

- National projections were multiplied by population ratio of California to the U.S. (12%) to get a rough estimate for the 2017 elevator projections of California.
Feedback From IOU Stakeholder Meeting

• Stakeholder meeting held May 7, 2014
  – The original lighting efficacy requirement of 35 lpw is low. LEDs and linear fluorescents achieve 70 lpw and above.
    • IOUs revised proposal to 60 lpw.
  – Would proposed code change apply to existing elevators?
    • Routine repairs will not trigger code.
    • Major controls and machine upgrades would trigger code.
Feedback From IOU Stakeholder Meeting (continued)

- There needs to be guarantee that lighting and HVAC will remain operational if elevator gets stuck.
  
  • Code proposal does not address HVAC requirements in cab when cab is occupied, HVAC requirements for the elevator shaft, or regeneration from the elevator system.

- For more feedback from the meeting, visit Title24Stakeholders.com
Request For Additional Feedback

• We would greatly appreciate any information you are able to provide to assist our efforts
  – technical information
  – market trends and forecast
  – cost data
• Visit Title24Stakeholders.com and respond to the RFI.
• Send feedback direction to:
  – Jbaffa@aswb-engineering.com
Questions?

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