Proposal Summary

Elevators

Updated: May 12, 2023
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Introduction

The document summarizes proposed revisions to the California Energy Code (Title 24, Part 6) that will be discussed during a utility-sponsored stakeholder meeting on May 23, 2023. The Statewide Utility Codes and Standards Enhancement (CASE) Team is seeking input and feedback. To provide your comments, email info@title24stakeholders.com by May 31, 2023.

Measure Description

Elevator Energy Efficiency

This measure would modify and add to Section 120.6(f) in Title 24, Part 6 to incorporate additional mandatory performance requirements for elevators. The new code language would require all elevators with a rise of 33 and greater to be a traction elevator with regen motors.

Data Needs/Stakeholder Information Requests

Costs

The cost-effectiveness analysis was performed using very conservative (high) maintenance costs and modernization costs for our elevators. If you feel that our costs are still not representative for the proposed traction elevator types, please let us know.

Code Changes

We provided an exception to the regenerative drive requirement if it interferes with the building load; please let us know if the code language is ambiguous or challenging to interpret.

Life Cycle

The elevators were assumed to require an overhaul / modernization every 25 years, with standard maintenance needed yearly. If your maintenance or modernization timelines are different, please let us know.

Data may be provided anonymously. To participate or provide information, please email DJ Joh, DJoh@energy-solution.com directly and cc info@title24stakeholders.com.

Draft Code Language

1. Power conversion system**.** New passenger elevators with capacities 4,000 pounds or less, with a rise of 33 feet or more, in new buildings shall have a power conversion system that complies with the following requirements:

A. Hydraulic elevators shall not be used.

B. Traction elevators shall be either:

i. A geared traction machine with AC Induction motor, or

ii. AC Gearless Traction permanent magnet synchronous machine, or alternative technologies that have equal or better efficiency

C. Regenerative Drive. Potential energy released during motion shall be recovered with a regenerative drive that supplies electrical energy to the building electrical system. Drives must meet or exceed a 96% power factor.

EXCEPTION to 120.6(f)1C: Where the Electrical Engineer of Record has calculated that there is insufficient building load to absorb the regenerated power under normal or standby power operation, regenerative drives are not required. This exception shall only be used after efforts have been made to modify the elevator system, including the use of alternate drives that allow for the diversion of regenerated energy, operating elevators at slower speed during standby power operation, and reducing the number of elevators in service during standby power operation.

2 ~~1~~. The light power density for the luminaires inside the elevator cab shall be no greater than 0.6 watts per square foot.

Exception to Section 120.6(f)2 ~~1~~: Interior signal lighting and interior display lighting are not included in the calculation of lighting power density.

3 ~~2~~. Elevator cab ventilation fans for cabs without space conditioning shall not exceed 0.33 watts per cfm as measured at maximum speed.

4 ~~3~~. When the elevator cab is stopped and unoccupied with doors closed for over 15 minutes, the cab interior lighting and ventilation fans shall be switched off until elevator cab operation resumes.

5 ~~4~~. Lighting and ventilation shall remain operational in the event that the elevator cabin gets stuck when passengers are in the cabin.

6 ~~5~~. Elevator Regenerative Drive, Lighting and Ventilation Control Acceptance. Before an occupancy permit is granted for elevators subject to 120.6(f), the following equipment and systems shall be certified as meeting the Acceptance Requirement for Code Compliance, as specified by the Reference Nonresidential Appendix NA7. A Certificate of Acceptance shall be submitted to the enforcement agency that certifies that the equipment and systems meet the acceptance requirements specified in NA7.14.

EXCEPTION to Section 120.6(f): Elevators located in healthcare facilities.

Standards

Reference Appendices

Nonresidential Appendix NA7

Appendix NA7 – Installation and Acceptance Requirements for Nonresidential Buildings and Covered Processes

NA7.14 Elevator Regenerative Drive, Lighting and Ventilation Controls

NA7.14.1 Construction Inspection

Verify and document the following prior to functional testing:

a) Elevator has regenerative drive enabled or has documentation indicating the drive is exempted due to insufficient building load to absorb the regenerated the regenerated power under normal or standby power operation

b) The occupancy sensor has been located to minimize false signals, and the elevator cab does not have any obstructions that could adversely affect the sensor's performance.

~~b~~ c) For PIR sensors, the sensor pattern does not enter into the elevator lobby.

~~c~~ d) For ultrasonic sensors, the sensor does not emit audible sound.

Note that some elevators are able to use weight sensors to provide occupancy sensing. In this case, document that the elevator uses weight sensing to provide occupant sensing and proceed to the functional test.

NA7.14.2 Functional Testing

For each elevator cab being tested, confirm the following:

a) Verify that the lighting and ventilation controlled inside the elevator cab turn off after 15 minutes from the start of an unoccupied condition.

b) Verify that the signal sensitivity is adequate to achieve desired control. The sensor should not detect motion in the elevator lobby.

c) Verify that lighting and ventilation immediately turn "on" when an unoccupied condition becomes occupied.

d) Verify that the lighting and ventilation will not shut off when occupied. Stand in the elevator with the door closed.