

# CECD1-26-22

IECC: C405.2, C405.2.1, C405.2.1.1, C405.2.1.5 (New)

Proponents: Michael Jouaneh, representing the IECC CE Electrical power, lighting, and renewables subcommittee

## 2024 International Energy Conservation Code [CE Project]

Revise as follows:

**C405.2 Lighting controls.** Lighting systems powered through the energy service for the building shall be provided with controls that comply with Sections C405.2.1 through C405.2.9. Interior exit stairways shall only comply with the requirements of Section C405.2.1.

**Exceptions:** Lighting controls are not required for the following:

1. Spaces where an automatic shutoff could endanger occupant safety or security.
2. ~~Interior exit stairways, interior~~ Interior exit ramps and exit passageways.
3. Emergency lighting that is automatically off during normal operations.
4. Emergency lighting required by the *International Building Code* in exit access components which are not provided with fire alarm systems.
5. Up to 0.02 watts per square foot (0.06 W/m<sup>2</sup>) of lighting in exit access components which are provided with fire alarm systems.

**C405.2.1 Occupant sensor controls.** Occupant *sensor controls* shall be installed to control lights in the following space types:

1. Classrooms/lecture/training rooms.
2. Conference/meeting/multipurpose rooms.
3. Copy/print rooms.
4. Lounges/breakrooms.
5. Enclosed offices.
6. Open plan office areas.
7. Restrooms.
8. Storage rooms.
9. Locker rooms.
10. Corridors.
11. Warehouse storage areas.
12. Interior exit stairways subject to C405.2.1.5
- ~~12-13.~~ Other spaces 300 square feet (28 m<sup>2</sup>) or less that are enclosed by floor-to-ceiling height partitions.

**Exception:** Luminaires that are required to have specific application controls in accordance with Section C405.2.5.

**C405.2.1.1 Occupant sensor control function.** Occupant sensor controls in warehouses shall comply with Section C405.2.1.2. Occupant sensor controls in open plan office areas shall comply with Section C405.2.1.3. Occupant sensor controls in corridors shall comply with Section C405.2.1.4. Occupant sensor controls in interior exit stairways shall comply with Section C405.2.1.5. Occupant sensor controls for all other spaces specified in Section C405.2.1 shall comply with the following:

1. They shall automatically turn off lights within 20 minutes after all occupants have left the space.
2. They shall be manual on or controlled to automatically turn on the lighting to not more than 50-percent power.
3. They shall incorporate a manual control to allow occupants to turn off lights.

**Exception:** Full automatic-on controls with no manual control shall be permitted in corridors, interior parking areas, stairways, restrooms, locker rooms, lobbies, library stacks and areas where manual operation would endanger occupant safety or security.

Add new text as follows:

**C405.2.1.5 Occupant sensor control function in interior exit stairways.** Lighting in exit access stairways, exit stairways and their landings, where the applicable building code or life safety code requires a minimum illuminance of 10 footcandles on the walking surface shall uniformly reduce

lighting power to no more than 50 percent of full power within 20 minutes after all occupants have left the space.

**Reason:** Stairwells are the most vacant spaces in commercial buildings (vacant 90% of the time). This proposal provides energy savings by requiring the lighting to be reduced to 50% when the stairwells are vacant. Consistent with language that has been in Title 24 and 90.1 for years. And this consistent with PLR committee proposal CECD1-20 for exit stair power. This proposal simply adds the controls that the IBC intended. By saying “when the stairway is in use”, the IBC intent is to allow for light switches at each floor level landing or occupants sensors. They did not intend for the stairway to be illuminated to 10 fc at all times the building is occupied.

**Cost Impact:** The code change proposal will increase the cost of construction.

Will increase the cost of construction but the energy saving from the controls offsets the cost. We conservatively estimate that stairwell are unoccupied 90% of the time and thus a dedicated sensor controlling a 30 Watt luminaire would save approximately 118 kWh/yr (half off) and save approximately \$13/yr (half-off). With a lifetime of 15 years the scalar limit is 11.7 present valued years. Thus, the present valued savings of such a control is \$152 (half -off). Luminaire level occupancy controls are substantially less in cost. Thus, this is cost-effective.