**EE 13:**

**USE MANUAL ON-AUTO OFF LIGHTING**

*New York City Building Code*
Proposal developed by the Lighting & Daylighting Committee

**Summary**

**Issue:**
Occupancy sensors turn on lights when a room is entered, then turn them off after people have departed. This does not maximize energy savings because light is not always needed at entry, if the use is transitory or daylighting is available.

**Recommendation:**
Require vacancy sensors, which contain a manual On switch, coupled with an occupancy sensor that turns lights off after a period of vacancy.

**Proposed Legislation, Rule or Study**

*Amendments to ANSI/ASHRAE/IESNA 90.1 (2007), as incorporated in Chapter 13 of the New York City Building Code:*

1. Add a new definition to Section 3.2 as follows:

   **Vacancy sensor:** An occupant sensor for which the lights must be manually turned on but the sensor automatically turns the lights off soon after an area is vacated that meets the following requirements:
   a. Shall not turn on the lighting automatically, except that they shall have a grace period of 15 seconds to 30 seconds to turn on the lighting automatically after the sensor has turned off the lighting; and
   b. Shall not have an override switch that converts occupant sensors from manual on to automatic-on functionality.

2. Amend paragraph (a) of Section 9.4.1.2 as follows:

   **9.4.1.2 Space Control.** Each space enclosed by ceiling height partitions shall have at least one control device to independently control the general lighting within the space. Each manual device shall be readily accessible and located so the occupants can see the controlled lighting.
   a. A **vacancy sensor** [An occupant sensor] shall be installed that automatically turns lighting off within 30 minutes of all occupants leaving a space[, except spaces with multi-scene control,] in
      1. classrooms (not including shop classrooms, laboratory classrooms, and preschool [through 12th grade] classrooms),
      2. conference/meeting rooms, [and]
      3. employee lunch and break rooms, and
      4. offices smaller than 200 square feet.

**Supporting Information**

**Issues – Expanded**
Occupant sensors have been used for decades, saving tremendous amounts of energy, and are required under the Energy Code. These sensors automatically turn on lights when a person enters a room and then automatically turn the lights off when the room is vacant. Unfortunately, occupant sensors sometimes turn lighting on when it is not needed, such as when a room is already sunlit or when someone is only passing briefly through a room. Once turned on, occupant sensors typically do not turn lights off for 30 minutes.

A variation of occupant sensors, known as a “vacancy sensor,” addresses this problem. Whereas occupant sensors turn automatically on and off, a vacancy sensor requires a person to manually turn the lights on and then automatically turns the lights off when the room is vacant.

This proposal would require vacancy sensors in the place of occupancy sensors for several building areas that are typically lit by natural light or that people often enter only briefly. It would also require vacancy sensors in small offices.
where no sensors are currently required under the Energy Code.

**Environmental & Health Benefits**
Vacancy sensors will reduce energy use, leading to reductions in greenhouse gas emissions and improvements to air quality.

This proposal was found to have a low, positive environmental impact per building and to impact a large number of buildings. It was thus given an environmental score of 2.

This proposal was found to have no significant positive health impact.

**Cost & Savings**
As described in the Executive Summary, Bovis Lend Lease prepared cost estimates for each Task Force proposal in the context of well-defined construction projects in specific buildings. Where possible, members of the Technical Committees prepared savings estimates for some of these projects and buildings. These cost and savings estimates are presented in the February 1st draft version of Appendix A. The innate uncertainty in how construction and operation will vary from one building to another, the complexity of the Task Force proposals, and the wide range of applications in which the proposals may be realized mean these figures are truly estimates.

This proposal is not expected to have any significant impact on capital costs. This proposal was also estimated to generate financial savings that will pay for the capital costs in less than three years depending on the building type.

**Precedents**
There are no known precedents for this proposal.

**LEED**
This proposal may facilitate achieving the following LEED Energy and Atmosphere credits:

- LEED NC-EA cr.1 Optimize Energy Performance;
- LEED EB-EA cr.1 Optimize Energy Performance;
- LEED CI-EA cr.1.2 Optimize Energy Performance, Lighting Controls;
- LEED ND-GCT cr.2 Energy Efficiency in Buildings;
- LEED for Schools EA cr.1 Optimize Energy Performance;
- Additional credits under LEED pilot programs.

**Implementation & Market Availability**
There are no implementation issues with this proposal. Vacancy sensors are widely available from manufacturers of lighting controls.