CTC Meeting #27
JUNE 17 – 18, 2013
Elevator Lobby

The following 2013 Group B changes have been compiled for the above noted CTC Area of Study. Code changes with an (*) indicate CTC sponsored code changes. These changes are intended to serve as the agenda for the CTC in order to establish CTC public comments, if any, for the upcoming 2013 Group B Final Action Hearings. THIS REPORT ONLY INLCUDES THOSE CODE CHANGES FOR WHICH CTC HAS TAKEN A POSITION ON A CODE CHANGE.

F185-13*
F189-13
F194-13

F185 – 13 CTC position was Support & Testify
CAH ACTION: AS

F185 – 13
909.4 (IBC [F] 909.4, IMC [F] 513.4), 909.4.7 (New) [IBC [F] 909.4.7 (New), IMC [F] 513.4.7 (New)]

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee (cbaldassarra@RJAGroup.com)

Revise as follows:

909.4 (IBC [F] 909.4, IMC [F] 513.4) Analysis. A rational analysis supporting the types of smoke control systems to be employed, their methods of operation, the systems supporting them and the methods of construction to be utilized shall accompany the submitted *construction documents* and shall include, but not be limited to, the items indicated in Sections 909.4.1 through ~~909.4.6~~ 909.4.7. [F]

909.4.7 (IBC [F] 909.4.7, IMC [F] 513.4.7) Smoke control system interaction. The design shall consider the interaction effects of the operation of multiple smoke control systems for all design scenarios.

Reason: The focus of this proposal is related to the interaction of multiple mechanical smoke control systems by asking for a specific analysis of the interaction of such systems similar to that required for the interaction of HVAC systems. The study of hoistway pressurization as an option for compliance with enclosed elevator lobby provisions drives the need to understand these interactions as stair pressurization will almost always be present in these buildings as well.

The CTC studied the need for elevator lobbies for traditional elevators (Section 713.14.1), FSAE (3007) and Occupant Evacuation elevators (3008). The Study Group assigned by the CTC conducted a technical analysis that concluded with several recommendations for the need for such lobbies and in addition provided a recommendation on the need for a closer analysis of buildings with more complexities. From this technical analysis the following excerpt is relative to this proposal.

> *In fact in many cases a traditional enclosed elevator lobby was determined to be unnecessary but for unusual building configurations there was more of a concern for interaction of systems and the negative impact of stack effect based upon the findings of the analysis. For instance, high-rise buildings may contain an atrium and will also use stair pressurization. In some cases hoistway pressurization could also be used as an option for compliance with the enclosed elevator lobby requirements. These are three smoke control systems that when running simultaneously may not work as intended. Below is recommendation 5 from the technical analysis.*

5. Elevator hoistway pressurization design

- ***The design of pressurization systems for elevator hoistways shall be based on a rational analysis in accordance with Section 909.4 that utilizes a network model approved by the AHJ and which includes an analysis of possible interactions between building shafts pressurized by different systems, and between pressurized and unpressurized shafts that exceed 420 feet in height.***

  Add guidance to commentary for 909.4 that the rational analysis should show that the pressurization design will maintain the estimated Fractional Effective Dose (FED) below 0.5 and the estimated visibility distance above 25 feet within the stairway for 1.5 times the estimated evacuation time for each of the design fires selected.

  - *Rationale: Taller buildings with more complex flow paths require analysis utilizing a network model that can account for these interacting flow paths. The criteria suggested for commentary represents the standard of practice for a fire hazard analysis performed as the required rational analysis.*

This proposal is one of several proposals submitted by the CTC Elevator lobby SG. The ICC Executive Board directed the Code Technology Committee (CTC) to study the issue of elevator lobby separations in November 2010 due to the number of code change proposals submitted addressing this issue over a number of code change cycles. The Code Technology Committee formed a study group on the elevator lobby separation issue in December 2010. Note that this subject had been previously addressed by CABO/BCMC in 1986 with a similar conclusion. The code change proposals submitted are the result of the CTC's study of the issue. Note that the scope of the activity was as follows:

Scope

- ☐ Review the need for elevator lobbies, with emphasis on building use, building and hoistway height, active and passive fire protection features associated with the aforementioned.
- ☐ Review the differences and specific needs when dealing with elevator lobbies of traditional-use elevators, fire service elevators, and occupant evacuation elevators.
- ☐ Review related code provisions, such as egress from and through elevator lobbies.
- ☐ Review the appropriate use of alternatives including pressurization of hoistways, additional doors, roll-down style barriers, and gasketing systems.
- ☐ Review with members of elevator industry to scope the requirements of applicable elevator reference standards as it deals with elevator lobby design, use and construction.
- ☐ Review design and construction requirements for elevator lobbies, including but not limited to dimensions, location and separation.
- ☐ Review applicable code change history, technical studies and loss statistics as part of this review.

Several proposals were submitted during the Group A Cycle and discussion of the content and outcome of these proposals and the full content of the technical analysis can be found at the following link. http://www.iccsafe.org/cs/CTC/Pages/ElevatorLobbies.aspx

Cost Impact: This proposal will increase the cost of construction where such analysis are not currently undertaken. It can be argued that such an analysis may possibly decrease the cost of construction. Potential delays can be avoided by reducing the need for rework after problems arise during commissioning as result of an upfront analysis. Also the upfront design analysis may eliminate possible excess capacity in the equipment.

.

F185-13 REPORT OF HEARING

Committee Action: **Approved as Submitted**

Committee Reason: The interaction of various smoke control systems such as stair pressurization, hoistway pressurization and atrium smoke control need to be addressed to make sure the systems will perform as designed . It was noted that this particular problem is dealt with on a regular basis.

Assembly Action: **None**

SUGGESTED PUBLIC COMMENT: None

F189 – 13 CTC position Oppose
CAH ACTION: AS

909.6.3 (New) [IBC [F] 909.6.3 (New), IMC [F] 513.6.3 (New)]

Proponent: Bob D. Morgan, P.E., Fort Worth, TX Fire Department representing Fire Advisory Board to North Central Texas Council of Governments

Revise as follows:

909.6.3 (IBC [F] 909.6.3, IMC [F] 513.6.3) Pressurized stairways and elevator hoistways. When stairways or elevator hoistways are pressurized, such pressurization systems shall comply with Section 909 as smoke control systems, in addition to the requirements of the Building Code Sections 909.20 and 909.21.

Reason: Section 909.6.3 specifically requires that stairway pressurization systems must comply as smoke control systems. Currently, Sections 909.20 and 909.21 of the Building Code are not copied into the Fire Code, leading to inconsistency with regards to design and controls for such systems, as well as, uncertainty on the part of designers as to the appropriate authority with regards to such. These are complicated systems and involve coordination between fire alarm systems and mechanical components – such should be a coordinated effort between Building and Fire Code Officials.

Cost Impact: The code change proposal will not increase the cost of construction.

REPORT OF THE COMMITTEE HEARING

F189-13

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's reason statement that the code change provides needed correlation with the IBC.

Assembly Action: **None**

SUGGESTED PUBLIC COMMENT:

F194 – 13 CTC position was oppose
CAH ACTION: AS

[B] 909.21 (New)

Proponent: Joanne T. McCaughan, Code Specialist, Washington State Building Code Council, representing Washington State (joanne.mccaughan@des.wa.gov)

Add new text as follows:

[B] 909.21 Elevator hoistway pressurization alternative. Where elevator hoistway pressurization is provided in lieu of required enclosed elevator lobbies, the Pressurization system shall comply with Sections 909.21.1 through 909.21.11.

[B] 909.21.1 Pressurization requirements. Elevator hoistways shall be pressurized to maintain a minimum positive pressure of 0.10 inches of water (25 Pa) and a maximum positive pressure of 0.25 inches of water (67 Pa) with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all elevator cars at the floor of recall and all hoistway doors on the floor of recall open and all other hoistway doors closed. The opening and closing of hoistway doors at each level must be demonstrated during this test. The supply air intake shall be from an

outside uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet.

[B] 909.21.2 Rational analysis. A rational analysis complying with Section 909.4 shall be submitted with the construction documents.

[B] 909.21.3 Ducts for system. Any duct system that is part of the pressurization system shall be protected with the same fire resistance rating as required for the elevator shaft enclosure.

[B] 909.21.4 Fan system. The fan system provided for the pressurization system shall be as required by Sections 909.21.4.1 through 909.21.4.4.

[B] 909.21.4.1 Fire resistance. When located within the building, the fan system that provides the pressurization shall be protected with the same fire-resistance rating required for the elevator shaft enclosure.

[B] 909.21.4.2 Smoke detection. The fan system shall be equipped with a smoke detector that will automatically shut down the fan system when smoke is detected within the system.

[B] 909.21.4.3 Separate systems. A separate fan system shall be used for each elevator hoistway.

[B] 909.21.4.4 Fan capacity. The supply fan shall either be adjustable with a capacity of at least 1,000 cfm (0.4719 m3/s) per door, or that specified by a registered design professional to meet the requirements of a designed pressurization system.

[B] 909.21.5 Standby power. The pressurization system shall be provided with standby power from the same source as other required emergency systems for the building.

[B] 909.21.6 Activation of pressurization system. The elevator pressurization system shall be activated upon activation of the building fire alarm system or upon activation of the elevator lobby smoke detectors. Where both a building fire alarm system and elevator lobby smoke detectors are present, each shall be independently capable of activating the pressurization system.

[B] 909.21.7 Special inspection. Special inspection for performance shall be required in accordance with Section 909.18.8. System acceptance shall be in accordance with Section 909.19.

[B] 909.21.8 Marking and identification. Detection and control systems shall be marked in accordance with Section 909.14.

[B] 909.21.9 Control diagrams. Control diagrams shall be provided in accordance with Section 909.15.

[B] 909.21.10 Control panel. A control panel complying with Section 909.16 shall be provided.

[B] 909.21.11 System response time. Hoistway pressurization systems shall comply with the requirements for smoke control system response time in Section 909.17.

Reason: In the 2012 IBC, a new sub-section, 909.21 Elevator hoistway pressurization, was provided in Chapter 9. This same sub-section was not added to the 2012 IFC. For code consistency between these two codes, this sub-section should be located in both codes. Instead of the IBC being the primary code for this section, it should be maintained under the Fire Code. Currently, there is

potential conflict between Building and Fire Code enforcement and interpretation of the Codes in relation to these provisions. Adoption of this language into the 2015 IFC would eliminate the potential conflict.

Cost Impact: The code change proposal will not increase the cost of construction.

REPORT OF THE COMMITTEE HEARING

F194-13

Committee Action: **Approved as Submitted**

Committee Reason: This proposal was approved as it will provide more consistency between the IBC and IFC. Currently the provisions are only located with the IBC. It was noted that perhaps these provisions could be located before the maintenance provisions in current IFC Section 909.20.

Assembly Action: **None**

SUGGESTED PUBLIC COMMENT: