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December 1, 2009

TO: PARTIES INTERESTED IN VERTICALLY ACTING, EGRESS FIRE-DOOR ASSEMBLIES

SUBJECT: Proposed Acceptance Criteria for Vertically Acting, Egress Fire-door Assemblies, Subject AC421-1209-R1 (BB/GN)

Dear Madam or Sir:

A proposed new acceptance criteria, as presented in the attached criteria draft, is being posted on the ICC-ES web site to allow public comment.

An acceptance criteria is needed to provide direction in writing evaluation reports on vertically opening, egress fire-doors, since the code does not provide guidance for this type of product. The criteria deals with two very important issues - fire and egress. Furthermore, the product under consideration is very innovative, and therefore untried. For this reason, the criteria scope needs to be as narrow as possible to prevent the inclusion of products with specifications that have not been fully considered. The criteria can be expanded later, if need be, to accommodate a wider range of products.

The code currently does not include provisions for vertically acting doors. The reason for this might be that there has not yet been a market for these doors, or that technology had not yet advanced enough to provide reliable mechanisms for such doors. Whatever the reason, this type of door could provide a clear, unobstructed, full-width opening in just 80 inches of travel (straight up) and, therefore, merits consideration.

The proposed criteria was developed based on a set of enabling assumptions, which must be verified before the criteria can move forward. Therefore, after reading the criteria, please consider the following questions and provide comments to help direct our efforts:

1. Can vertically acting doors be egress doors under certain conditions?
2. If yes, should vertically acting, egress fire-doors be subject to the requirements of IBC Section 1008.1.4.3?
3. Section 1008.1.4.3 of the IBC requires that the doors be power-operated and capable of being operated manually in the event of power failure. Does manually require "human effort to lift the door," or could it mean "human effort to push a button to cause the door to lift by battery power"?

4. Could it be argued that if the possibility of power failure were very remote, then “human effort” operation would not be required?
5. Are 50 opening and closing cycles enough to show this?
6. If, in emergency mode, the battery power used to operate the door reaches a critical point of discharge, where it should no longer be used for egress, should the door automatically rise to egress height and then disengage from the power source so that the possibility of egress is maintained?
7. Would this be acceptable if, under this state, the door could close if a fusible link were broken because of excessive heat, at which time the opening would be unsafe to use for egress anyway?
8. Does causing a fire-door to stay in a partially open position while in emergency mode violate the requirement for a door to close to retard the passage of smoke?
9. Does NFPA 80, 11.4.2.2.1, which requires automatic-closing, rolling doors to remain closed until reset, exclude rolling doors from egress use?
10. Does the last paragraph of IBC Section 1008.1.2, due to its placement in the code (being after the exceptions), require all egress doors to swing if serving more than 50 occupants?
11. Should the last paragraph of IBC Section 1008.1.2 be interpreted to mean that all doors serving larger occupant loads must “swing”? Or simply that, if the doors swing, that they must do so “in the direction of egress travel”?
12. Does Item 4 under IBC Section 1008.1.4.3, requiring functionality even when the door is subjected to a 250-pound force, deal with the same issue as Item 11 above, for sliding doors?
13. Do provisions for panic or fire-exit hardware need to be included in the criteria?
14. What might constitute panic hardware for this type of door?
15. Should these doors be excluded from use where panic hardware is required?
16. Is the intent of panic hardware to provide for continuous motion of a crowd (not slow down a crowd) bent on egress?
17. Must vertically acting egress fire-doors comply with BHMA A156.10 and/or UL 325?

You are cordially invited to submit written comments, within 30 days of the date of this letter. Please use the comment form on the web site attaching any letters to the form. An explanation of the alternate criteria process can be found on our web site at http://www.icc-es.org/Criteria_Development/alternative_criteria_process.shtml.

All comments received in the 30-day comment period will be considered in preparing a proposed criteria that may be considered at a future Evaluation Committee meeting. Comments received will be posted on the web site shortly after the close of the comment period.

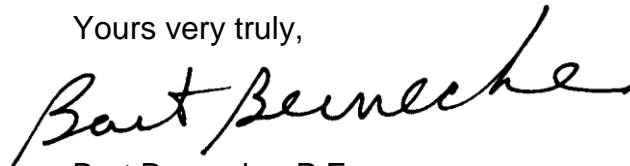
Correspondence received and a memo outlining staff's resolution of the comments in the correspondence will be posted on the web site shortly after the close of the comment period.

Your cooperation is requested in forwarding to the Los Angeles business/regional office all material directed to the Evaluation Committee. Parties interested in the deliberations of the committee should refrain from communicating, whether in writing or verbally, with committee members. The committee reserves the right to refuse communications that do not comply with this request.

Newly approved acceptance criteria may involve test methods or test protocols that are not currently included in the scope of testing services offered by accredited testing laboratories. As noted in the ICC-ES Rules of Procedure for Evaluation Reports, the scope of the laboratory's accreditation must include the type of testing that is to be reported to ICC-ES. We encourage accredited laboratories to expand their scopes of accreditation to include testing under newly approved acceptance criteria. Please note that testing laboratories must be accredited by the International Accreditation Service (IAS) or by another accreditation body that is a signatory to the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement. For further information, please contact IAS at (562) 699-0541, extension 3309, or send an e-mail to pmccullen@iasonline.org.

Please submit all comments using the form on the web site. Attach any letters to the comment form. If you have any questions (not comments), please contact the undersigned at (800) 423-6587, extension 5593, or Gary Nichols, at extension 5684. You may also reach us by e-mail at es@icc-es.org.

Yours very truly,



Bart Berneche, P.E.
Staff Engineer

BB/raf

Enclosure

cc: Evaluation Committee

PROPOSED ACCEPTANCE CRITERIA FOR VERTICALLY ACTING, EGRESS FIRE-DOOR ASSEMBLIES

AC421

Proposed December 2009

PREFACE

Evaluation reports issued by ICC Evaluation Service, Inc. (ICC-ES), are based upon performance features of the International family of codes and other widely adopted code families, including the Uniform Codes, the BOCA National Codes, and the SBCCI Standard Codes. Section 104.11 of the *International Building Code*® reads as follows:

The provisions of this code are not intended to prevent the installation of any materials or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

Similar provisions are contained in the Uniform Codes, the National Codes, and the Standard Codes.

ICC-ES may consider alternate criteria, provided the report applicant submits valid data demonstrating that the alternate criteria are at least equivalent to the criteria proposed in this document, and otherwise meet the applicable performance requirements of the codes. Notwithstanding that a product, material, or type or method of construction meets the requirements of the criteria proposed in this document, or that it can be demonstrated that valid alternate criteria are equivalent to the criteria in this document and otherwise meet the applicable performance requirements of the codes, ICC-ES retains the right to refuse to issue or renew an evaluation report, if the product, material, or type or method of construction is such that either unusual care with its installation or use must be exercised for satisfactory performance, or malfunctioning is apt to cause unreasonable property damage or personal injury or sickness relative to the benefits to be achieved by the use of the product, material, or type or method of construction.

Acceptance criteria are developed for use solely by ICC-ES for purpose of issuing ICC-ES evaluation reports.

PROPOSED ACCEPTANCE CRITERIA FOR VERTICALLY ACTING, EGRESS FIRE-DOOR ASSEMBLIES

1 1.0 INTRODUCTION

2 **1.1 Purpose:** The purpose of this acceptance criteria is to establish requirements
3 for vertically acting, egress fire-door assemblies to be recognized in an ICC Evaluation
4 Service, Inc. (ICC-ES), evaluation report under the 2009 *International Building Code*[®]
5 (IBC) since the building code does not include provisions for this type of product. Basis
6 of recognition is IBC Section 104.11. Applicable code sections are IBC Sections 715
7 and 1008.

8 **1.2 Scope:** Vertically acting, egress fire-door assemblies are used as opening
9 protectives in fire-resistance-rated wall assemblies, as smoke-and-draft-control
10 assemblies, and as a means of egress. Vertically acting egress fire-door assemblies
11 may remain open normally, and close only to provide fire and smoke protection, or they
12 may be kept closed to provide security, and be opened and closed on demand to
13 provide a means of egress.

14 1.3 Codes and Referenced Standards

15 **1.3.1** 2009 *International Building Code*[®] (IBC), International Code Council.

16 **1.3.2** ANSI/UL 10B-1997, UL Standard for Fire Safety Tests of Door
17 Assemblies, Underwriters Laboratories Inc.

18 **1.3.3** NFPA 80-07, Standard for Fire Doors and Other Opening Protectives,
19 National Fire Protection Association.

20 **1.3.4** ANSI/UL 325-02, UL Standard for Safety for Door, Drapery, Gate, Louver,
21 and Window Operators and Systems, Underwriters Laboratories Inc.

22 **1.3.5** ANSI/UL 864-96, UL Standard for Safety for Control Units for Fire-
23 protective Signaling Systems, Underwriters Laboratories Inc.

24 **1.3.6** BHMA A156.10-06, Power Operated Pedestrian Doors, Builders Hardware
25 Manufacturer's Association.

26 **1.4 Definitions:**

27 **1.4.1 Vertically-acting, Egress Fire-door Assembly:** A vertically-acting,
28 egress fire-door assembly is a fire door complying with IBC Section 715, hardware and
29 other accessories which provide for power operation as an alternate to egress doors in
30 compliance with IBC Section 1008, and a frame. These together provide a specific
31 degree of fire protection to an opening as well as provide for the use of the door as a
32 means of egress.

33 **1.4.2 Integrated Standby Power Supply:** The supply of power, which is part of a
34 nominally-functioning operating system (one that is working properly under normal
35 conditions), that is available for use by the operating system to continue normal
36 operations. The standby power is sufficient to operate the door for a minimum of 50
37 door opening and closing cycles, after the building power system has failed to deliver
38 the power necessary to keep the operating system in a nominally-functional state.

39 **1.4.3 Critical System Faults:** Critical system faults are conditions that would keep
40 the door from closing to protect the opening. These include interruptions of the closing
41 cycle caused by obstructions in the pathway of the door, standby power being below
42 nominally-functional strength during normal operation, and the intentional disabling of
43 power operation by the power operator due to depletion of standby power to below the
44 emergency operation threshold strength.

45 **1.4.4 Knowing-act Activation:** The act of operating a door operator by pressing a
46 switch or other similar action, with the knowledge of what will happen.

47 **2.0 BASIC INFORMATION**

48 **2.1 General:** The following information shall be submitted:

49 **2.1.1 Product Description:** The following details shall be submitted:

50 **2.1.1.1** General information on each component of the vertically-acting, egress
51 fire-door assembly.

52 **2.1.1.2** Complete information concerning assembly dimensions, configuration,
53 and material specifications.

54 **2.1.1.3** Manufacturing process.

55 **2.1.1.4** Dimensioned scaled drawings of the assembly with significant
56 components of the assembly identified.

57 **2.1.2 Installation Instructions:** Installation shall be in accordance with NFPA 80
58 and the instructions shall be in accordance with the instruction requirements of UL 325.
59 Installation details shall be submitted and shall include the following:

60 **2.1.2.1** Instructions on the installation of all assembly components and
61 configuration of the automatic closing system.

62 **2.1.2.2** Electrical schematics for all applicable assembly components. The
63 installation instructions shall specify that the assembly and the automatic closing system
64 shall be installed in accordance with the applicable requirements of the IBC, the
65 National Electrical Code, and NFPA 80, and that the local code official shall be
66 consulted for applicable requirements before installing.

67 **2.1.2.3** Instructions on field-testing the installed assembly for proper operation.
68 The installation instructions shall specify the need for electrical supervision of the power
69 supply and to consult with the local code official for applicable requirements at the time
70 of installation.

71 **2.1.2.4** An inspection shall be performed on each door, at installation, and
72 successful testing shall be documented in writing by the installer and a copy provided to
73 the local code official and building owner's representative. The documentation shall
74 state the requirement for not less than annual inspection by a trained door systems
75 technician in accordance with the requirements of NFPA 80. Written records of all

76 testing shall be maintained and shall be made available to the local code official upon
77 request. The door system technicians must be trained and approved by the door
78 assembly manufacturer, and the training and approval program documentation shall be
79 submitted to ICC-ES as part of the quality control documentation.

80 **2.1.3 Packaging and Identification:** A description of the method of packaging and
81 field identification of the vertically-acting, egress fire-door assemblies shall be included.
82 Identification of each assembly shall include the evaluation report number, the name or
83 logo of the inspection agency, and the serial number for each assembly; the
84 manufacturer's name and location; the model number; and the fire-resistance and
85 smoke rating of the assembly. If an assembly is manufactured at several locations, each
86 component shall be distinctively marked to identify its place of manufacture. The logo of
87 the inspection agency, if used as part of the identification, must be included in the report
88 under this acceptance criteria.

89 **2.1.4 Field Preparation:** Details shall be submitted of field preparation for
90 installing a vertically-acting, egress fire-door assembly. Details or minimum criteria for
91 field preparation of the surrounding construction that provides structural support to the
92 assembly and its components, shall also be submitted.

93 **2.2 Testing Laboratories:** Testing laboratories shall comply with Section 2.0 of the
94 ICC-ES Acceptance Criteria for Test Reports (AC85) and Section 4.2 of the ICC-ES
95 Rules of Procedure for Evaluation Reports.

96 **2.3 Test Reports:** Test reports shall comply with AC85.

97 **2.4 Product Sampling:** Sampling of vertically-acting, egress fire-door assemblies
98 for tests under this criteria shall comply with Section 3.1 of AC85.

99 **3.0 TEST AND PERFORMANCE REQUIREMENTS**

100 **3.1 Assembly Components:**

101 **3.1.1 General:** Vertically-acting, egress fire-door assemblies qualified in
102 accordance with this acceptance criteria shall be constructed as described in the
103 approved quality documentation. The assemblies shall comply with the applicable fire
104 protection rating in accordance with IBC Section 715. The door shall also comply with
105 the reliability and ease-of-use characteristics outlined in this criteria.

106 **3.1.2 Door:** The door shall be power operated and the operator shall have an
107 integrated standby power supply. The door shall be operable from both sides without
108 special knowledge or effort, using a force not to exceed 15 pounds (67 N) on the
109 actuating device of the door operator, even when the door is subjected to a 250 pound
110 (1100 N) force applied perpendicular to the door adjacent to the opening device.

111 **3.1.3 Door Operator:** Only labeled power operators and motors specifically
112 listed for use with the door shall be used. Listed power operator systems and motors
113 shall comply with the requirements of ANSI/UL 325. Operator motors shall be protected.

114 **3.1.4 Integrated Standby Power Supply:** Standby power shall be provided as
115 part of the door operating system. The standby power shall pick up its connected loads
116 within 10 seconds of failure of the building's normal source of power. The standby
117 power shall have a capacity of 50 opening and closing cycles, from fully closed - to a
118 minimum of 80 inches (203 cm) above finished floor to allow egress - to fully closed
119 again to protect the opening.

120 **3.1.5 Releasing Device:** The door shall be automatic-closing by smoke
121 detection in accordance with IBC Section 715.4.8.3, and shall be self-closing when the
122 temperature reaches 500°F (260°C) on either side of the door. After self-closing, the
123 door shall remain closed until reset.

124 **3.2 Performance Testing:** The door assembly and operating system shall be tested
125 in accordance with the UL 10B and UL325 standards. Testing shall be submitted
126 verifying the following performance characteristics:

127 **3.2.1** The door must be easily recognized as being a door and must be operable
128 without a key or special knowledge or special effort. The door assembly shall have

129 signage meeting the intent of UL 325 and BHMA A156.10 requirements for sliding
130 doors, and the specifications shall be submitted by the manufacturer to ICC-ES for
131 approval. The actuating device shall function by knowing-act activation. If a force is
132 required to activate the device to signal the power operating system to open the door,
133 the force shall not be more than 15 pounds (67 N). On the side of the door from which
134 egress is made, the force shall be applied normal to the plane of the door in the
135 direction of egress travel. The door shall be operable as specified even when a force of
136 250 pounds (1100 N) is applied perpendicular to the door adjacent to the opening
137 device.

138 **3.2.2** Closing speed shall be not less than 6 inches (152 mm) per second to
139 assure timely protection of the opening, and not more than 24 inches (61 cm) per
140 second, in accordance with NFPA 80. The door assembly shall have entrapment
141 protection meeting the intent of the requirements of Section 29 of UL 325 and BHMA
142 A156.10 for sliding doors and these specifications shall be submitted by the
143 manufacturer to ICC-ES for approval.

144 **3.2.3** The assembly shall be self-closing or automatically closing upon signal from
145 a separately supplied UL 864 listed building alarm system or from a listed smoke-
146 automatic fire detector, fire alarm equipment, or approved signaling device installed in
147 accordance with NFPA 80.

148 **3.2.4** While in a fire alarm condition, the door shall open to a minimum of 80
149 inches (203 cm) above finished floor within 10 seconds of actuating the operating
150 device and shall not have more than a 10 second delay after the opening is cleared of
151 pedestrians before the door starts to re-close.

152 **3.2.5** The door shall be equipped with integrated, standby power and shall be
153 subjected to cycle testing to verify the reserve power capacity. One cycle shall be
154 defined as the time to completely open the door to a height of 80 inches (203 cm)
155 minimum, from a fully closed position, and return it to the fully closed position. The

156 integrated standby power supply shall have sufficient capacity to operate the door 50
157 cycles without the aid of building power.

158 **3.2.6** The door assembly shall include heat responsive links for fire protection
159 service complying with UL 33 or temperature-sensing releasing devices complying with
160 864 installed at the door opening as required by NFPA 80. The temperature-sensing
161 devices shall cause the door to self-close when the temperature reaches 500°F (260°C)
162 on either side of the door. Once self-closed due to excessive temperature at the
163 opening, the door shall remain in the closed position until operation of the assembly is
164 reset.

165 **3.2.7** The assembly shall include sensors to stop the door from closing beyond
166 an obstruction during a power closing cycle if the pathway is obstructed. If the door is
167 stopped as a result of sensing an obstruction, the door shall re-open to full egress
168 height, and resume closing within 10 seconds if in the alarm condition, at which point
169 the door would stop at the obstruction. When the obstruction is removed, the door shall
170 resume closing within 10 seconds to the fully closed position.

171 **3.3 Fire-resistance Testing:**

172 **3.3.1** The fire-resistance rating of the vertically-acting, egress fire door assembly
173 shall be established by tests conducted in accordance with UL 10B.

174 **3.3.2** The fire-resistance rating of the assembly shall be compatible with the fire-
175 resistance rating of the opening into which it is to be installed in accordance with IBC
176 Section 715.

177 **3.3.3** The vertically-acting, egress fire door assembly shall be installed in the test
178 door opening in the manner in which it is intended to be used. The tested door
179 assembly shall be subjected to the fire-endurance test with the door's bottom bar resting
180 on a non-combustible floor surface.

181 **3.3.4** Nonsymmetrical assemblies shall be tested with both faces exposed to the
182 furnace, and the assigned fire resistance rating shall be the shortest duration obtained

183 from the two tests. When evidence is furnished to show that the door was tested with
184 the least fire-resistant side exposed to the furnace, the assembly need not be subjected
185 to tests from the opposite side, subject to acceptance by ICC-ES.

186 **3.4 Transmission of Alarms and Faults:** Critical system faults shall cause an
187 audible and visible alarm signal to be activated at the door location. The assembly shall
188 have the capability of signaling critical system faults to a constantly attended location as
189 required by the code official. The fire-door assembly's status, both the alarm condition
190 and state (open and closed), shall be capable of being remotely monitored as required
191 by the code official.

192 **4.0 QUALITY CONTROL**

193 **4.1** Vertically-acting, egress fire door assemblies shall be manufactured under an
194 approved quality control program with inspections by an inspection agency accredited
195 by IAS, or otherwise acceptable to ICC-ES.

196 **4.2** Quality documentation complying with the ICC-ES Acceptance Criteria for
197 Quality Documentation (AC10) shall be submitted.

198 **5.0 EVALUATION REPORT RECOGNITION**

199 The evaluation report shall provide the following information:

200 **5.1** Drawings and details of the vertically-acting, egress fire-door assembly, including
201 a list of all components qualified under this criteria.

202 **5.2** A description of the fire-resistant construction in which the vertically-acting,
203 egress fire-door assembly was qualified in accordance with the test requirements
204 specified in Section 3.2 of this criteria.

205 **5.3** The minimum and maximum door sizes allowable for the door assembly.

206 **5.4** The following conditions of use shall be included in the evaluation report:

207 **5.4.1** Use only those components described in the evaluation report - every
208 component used with the door assembly is listed specifically for its intended use.

209 **5.4.2** The door assembly must be installed and tested by trained installers
210 approved by the door assembly manufacturer.

211 **5.4.3** The door must be kept clear of obstructions at all times.

212 **5.4.4** The door must be inspected and tested at least once each year to verify
213 proper working condition. Records of these yearly inspections and tests shall be kept
214 and shall be made available to the code official for inspection. ■