AGENDA
NFPA Technical Committee on Fundamentals
NFPA 101 and NFPA 5000 First Draft Meeting

Thursday-Friday, July 30-31, 2015
InterContinental Milwaukee
Milwaukee, WI

1. **Call to order.** Call meeting to order by Chair Chip Carson at 8:00 a.m. on July 30, 2015 at the InterContinental Milwaukee Hotel, Milwaukee, WI.

2. **Introduction of committee members and guests.** For a current committee roster, **see page 03.**

3. **Approval of May 22, 2013 second draft meeting minutes.** S**ee page 06.**

4. **The process – staff PowerPoint presentation. See page 09.**

5. **Correlating committee minutes with direction for 2018 editions. See page 26.**

6. **Multi hazards (other than fire) task group and FPRF report.** Norm Groner – Chair, Amy Cheng, Scott Laramee and Jake Pauls. **See page 33.**

7. **Hazardous materials task group report** (affects 101 PIs assigned to FUN)**. See page 124.**

8. **Formatting Task Group report (re: No Requirement, No Special Requirement, Reserved).** Jonathan Humble – Chair, Scott Laramee and Jim Lathrop.

9. **Definition of *renovation* dropped from NFPA 101 Chapter 3 - reinsert. See page 132.**

10. **Special structures 11.1.1 application – fix last sentence re: high-rise buildings. See page 133.**

11. **Require *fire barriers* for separated occupancies so Chapter 8 can be referenced. See page 134.**

12. **NFPA 5000 annexes errors. See page 137.**

13. **Fire safety directors proposed standard. See page 146.**

14. **Referenced publications edition updating. See page 147.**

15. **Action on 2015 edition TIAs. See public inputs 101 PI-33 and 5000 PI-16.**

16. NFPA 101 First Draft preparation. For Public Input, **see page 150.**

17. NFPA 5000 First Draft preparation. For Public Input, **see page 281.**

18. Other business.

19. Future meetings.

20. Adjournment.

Enclosures

Address List No Phone

07/06/2015
Ron Coté
SAF-FUN

Fundamentals

Safety to Life

Wayne G. Carson **SE** 1/1/1988
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Safety to Life

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MINUTES
NFPA Technical Committee on Fundamentals
NFPA 101 and NFPA 5000 Second Draft Meeting

May 22, 2013
DoubleTree Hotel
San Diego, California

1. **Call to Order.** Meeting called to order by Chair Chip Carson at 8:00 a.m. on May 22, 2013 at the DoubleTree Hotel, San Diego, California.

2. **Introduction of Committee Members and Guests.**

TECHNICAL COMMITTEE MEMBERS PRESENT

NAME	ORGANIZATION/REPRESENTING
Chip Carson, Chair	Carson Associates, Inc.
Ron Coté, Secretary	National Fire Protection Association
William Adams, Alternate to Jack McNamara	Apollo America Rep. National Electrical Manufacturers Assn.
Amy Cheng, Principal	Clark County Department of Development
Salvatore DiCristina, Principal	Rutgers, The State University of New Jersey
Helen DiPietro, Principal	North Carolina Department of Insurance
Tod Doebler, Principal	Menomonee Falls Fire Department Rep. International Fire Marshals Association
Robert Eugene, Principal	Underwriters Laboratories LLC
Thomas Hammerberg, Alternate to Rodger Reiswig	Automatic Fire Alarm Association, Inc.
Jonathan Humble, Alternate to Farid Alfawakhiri	American Iron and Steel Institute
Morgan Hurley, Principal	Society of Fire Protection Engineers
David Jacoby, Principal	Simpson Gumpertz & Heger
Scott Laramee, Principal	Aon Fire Protection Engineering Corporation
James Lathrop, Principal	Koffel Associates, Inc.
Jack McNamara, Principal	Bosch Security Systems Rep. National Electrical Manufacturers Assn.
Rodney McPhee, Alternate to Dennis Pitts	Canadian Wood Council Rep. American Forest & Paper Association
Richardo Murga, Principal	US Department of Health & Human Services Indian Health Service

Jake Pauls, Principal	Jake Pauls Consulting Services in Building Use & Safety Rep. American Public Health Association
Dennis Pitts, Principal	American Wood Council Rep. American Forest & Paper Association
Milosh Puchovsky, Principal	Worcester Polytechnic Institute

GUESTS

NAME	ORGANIZATION/REPRESENTING
Alan Gettelman	Bobrick Washroom Equipment
Robert Solomon	National Fire Protection Association
Tracy Vecchiarelli	National Fire Protection Association

TECHNICAL COMMITTEE MEMBERS NOT PRESENT

NAME	ORGANIZATION/REPRESENTING
Andrew Blum, Principal	Exponent, Inc.
David Frable, Principal	US General Services Administration
Marshall Gaubert, Principal	Jefferson Parish Fire Department
Michael Gencarelli, Principal	US Department of the Navy
Ralph Gerdes, Principal	American Institute of Architects
Norman Groner, Principal	John Jay College of Criminal Justice
David Klein	US Department of Veterans Affairs
Vickie Lovell, Principal	InterCode Inc. Rep. Alliance for Fire & Smoke Containment & Control, Inc.
Patrick Saba, Principal	Hewlett Packard Company
Victoria Valentine, Principal	National Fire Sprinkler Association
Steven Wydeveld, Principal	Wydeveld Construction & Consulting, Inc.

3. **Approval of Previous Meeting Minutes.** The May 23-24, 2012 meeting minutes were approved as written and distributed.

4. **The New Process Review.** Staff reviewed the PowerPoint slides included with the agenda, focusing on the Second Draft preparation portion of the revision cycle.

5. **Definitions Task Group.** Jack McNamara volunteered to serve on the task group being formed by the Correlating Committees to recommend the assignment of responsibility, for each defined term in NFPA 101 and NFPA 5000, to the appropriate technical committee with expertise in the subject. The plan is for the task group to report its recommendations to the Correlating Committees in 2015 to permit the technical committees to assume responsibility for their assigned definitions for the revision cycle that will produce the 2018 edition of NFPA 101 and NFPA 5000.

6. **Hazardous Materials Task Group.** The committee agreed that it did not need a representative on the task group being formed by the Correlating Committees to address hazardous materials.

7. **Multi Hazards Task Group.** Chair Chip Carson reported that the Fire Protection Research Foundation will undertake a project to identify provisions in NFPA 101 and NFPA 5000 that address more than fire safety. The current task group consisting of Norm Groner – Chair, Amy Cheng, Scott Laramee and Jake Pauls was retained on the agenda.

8. **NFPA 101 Chapter 2 Reference to NFPA 400.** The subject was addressed via the creation of a Second Revision to add NFPA 400 to the list of referenced NFPA documents in Chapter 2.

9. **NFPA 101 Second Draft (formerly ROC) Review.** All public comments were resolved. Correlating Committee Notes, from the First Draft Report, were resolved. Second Revisions were drafted and approved, including some created in response to requests from other technical committees that met during the week.

10. **NFPA 5000 Second Draft (formerly ROC) Review.** All public comments were resolved. Correlating Committee Notes, from the First Draft Report, were resolved. Second Revisions were drafted and approved, including some created in response to requests from other technical committees that met during the week.

11. **Other Business.**

    - **Task Group on Formatting.** A task group was formed, at the request of the Correlating Committees, to recommend a consistent formatting scheme to be used throughout NFPA 101 and NFPA 5000 where the labels "No Requirement", "No Special Requirement", and "Reserved" are currently used. The task group consists of Jonathan Humble – Chair, Scott Laramee, and Jim Lathrop. The plan is for the task group to report its recommendations to the Correlating Committees in 2015 to permit the technical committees to implement the guideline for the revision cycle that will produce the 2018 edition of NFPA 101 and NFPA 5000. Retain task group on agenda for next meeting.

12. **Adjournment.** The meeting was adjourned at 4.25 p.m.

Minutes prepared by Ron Coté and Kelly Carey

National Fire Protection Association
The authority on fire, electrical and building safety

NFPA 101 / 5000 First Draft Meetings

InterContinental Hotel
Milwaukee, Wisconsin

July 27-31 and August 24-28, 2015

NFPA First Draft Meeting

At this and all NFPA committee meetings we are concerned with your safety

If the fire alarm sounds, please egress the building



NFPA First Draft Meeting

Members

- Please verify/update your contact information on roster attached to sign-in list
- Members categorized in any interest category who have been retained to represent the interests of ANOTHER interest category (with respect to issues addressed by the TC) shall declare those interests to the committee and refrain from voting on those issues throughout the process

NFPA First Draft Meeting

Guests

- All guests are required to sign in and identify their affiliations
- Participation is limited to TC members or those individuals who have previously requested time to address the committee
- Participation by other guests is permitted at the Chair's discretion

NFPA First Draft Meeting

Members and Guests

- Use of audio recorders or other means capable of reproducing verbatim transcriptions of this meeting is not permitted

Annual 2017 Revision Cycle – Key Dates

- Public Input Stage (First Draft):
  - First Draft Meeting**: July 27-31 and August 24-28, 2015**
  - Posting of First Draft for Balloting Date: **before October 26, 2015**
  - Posting of First Draft for Public Comment: **March 7, 2016**
- Comment Stage (Second Draft):
  - Public Comment Closing Date: **May 16, 2016**
  - Second Draft Meeting Period: **TBD - June 1 to July 25, 2016**
  - Posting of Second Draft for Balloting Date: **September 5, 2016**
  - Posting of Second Draft for NITMAM: **January 16, 2017**
- Tech Session Preparation:
  - NITMAM Closing Date: **February 20, 2017**
  - NITMAM / CAM Posting Date: **April 17, 2017**
  - NFPA Annual Meeting: **June 4-7, 2017 (Boston)**
- Standards Council Issuance:
  - Issuance of Documents with CAM: **August 10, 2017**

NFPA First Draft Meeting

Voting During the First Draft Meeting

- Either Principal or Alternate can vote; not both
- All Principals are encouraged to have an Alternate
- Voting (simple majority) during meeting is used to establish a sense of agreement on First Revisions
- Voting (simple majority) during meeting is also used to establish Public Input resolution responses and to create Committee Inputs

NFPA First Draft Meeting

General Procedures

- Follow Robert's Rules of Order
- Discussion requires a motion

NFPA First Draft Meeting

Motion to End Debate, Previous Question, or to "Call the Question"

- Not in order when another member has the floor
- Requires a second
- Not debatable and DOES NOT automatically stop debate
- 2/3 affirmative vote immediately closes debate, returns to the original motion
- Less than 2/3 allows debate to continue

NFPA First Draft Meeting

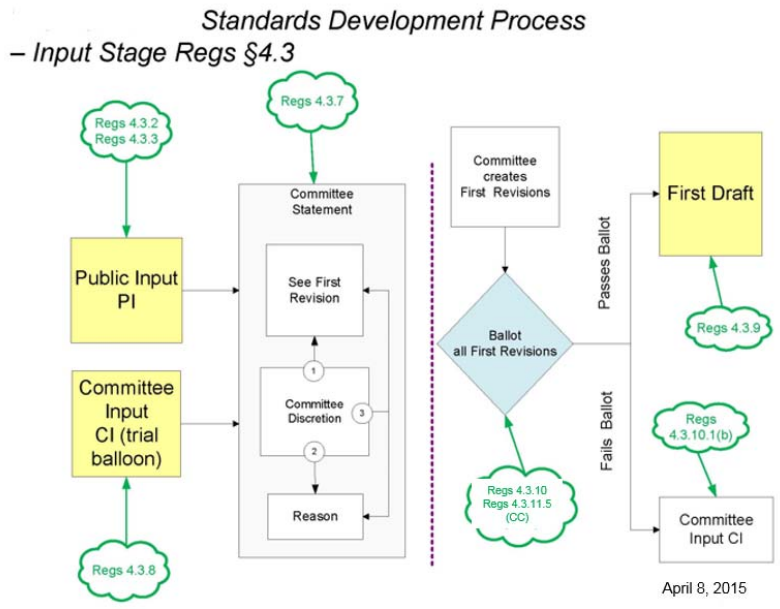
Committee member actions:

- Member addresses the chair
- Receives recognition from the chair
- Member introduces the motion
- Another member seconds the motion

NFPA First Draft Meeting

Committee chair actions:

- Restates the motion
- Calls for discussion
- Ensures all issues have been heard
- Calls for a vote
- Announces the vote result



NFPA First Draft Meeting

Committee Actions and Motions:

- Resolve Public Input (PI)
- Create a First Revision (FR)
- Create a Committee Input (CI) – a placeholder used to solicit Public Comments and permit further work at Second Draft stage

NFPA First Draft Meeting

Resolve a Public Input (PI)

- Committee develops a Committee Statement (CS) to respond to (i.e., resolve) a Public Input
- Committee indicates in CS its reasons for not accepting the recommendation and/or points to a relevant First Revision
- PI does not get balloted

NFPA First Draft Meeting

Create a First Revision (FR)

- FR is created to change current text or add new text
- Committee Statement (CS) is developed to substantiate the change
- Associated PIs get a committee response, often simply referring to the relevant FR
- Each FR gets balloted

NFPA First Draft Meeting

Create a Committee Input (CI)

- Committee is not ready to incorporate a change into the First Draft but wants to receive Public Comment on a topic that can be revisited at Second Draft stage
- Committee Statement (CS) is developed to explain committee's intent
- CI is not balloted

NFPA First Draft Meeting

Committee Statements (Substantiation):

- All Public Input must receive a Committee Statement
- Provide a valid technical reason
- Do not use vague references to “intent”
- Explain how the submitter’s substantiation is inadequate
- Reference a First Revision if it addresses the intent of the submitter’s Public Input

NFPA First Draft Meeting

Formal Voting on First Revisions

- In-meeting votes establish a sense of agreement on the development of First Revisions (FR)
- FRs are secured by electronic balloting (≥2/3 of completed ballots affirmative, and affirmative by ≥1/2 voting members)
- Only the results of the electronic ballot determine the official position of the committee on the First Draft

NFPA First Draft Meeting

Ballots

- Only First Revisions (FR) are balloted
  - Public Inputs and Committee Statements not balloted
  - Reference materials are available
    - First Draft, PI, CI, and CS
- Voting options:
  - Affirmative on all FRs
  - Affirmative on all FRs with exceptions specifically noted
- Ballot provides option to vote affirmative with comment
- Vote to reject or abstain requires a reason

NFPA First Draft Meeting

Electronic Balloting

- Web-based balloting system
- Alternates are encouraged to return ballots
- Ballot session will time out after 90 minutes
- Use “submit” to save your work – ballots can be revised until the balloting period is closed

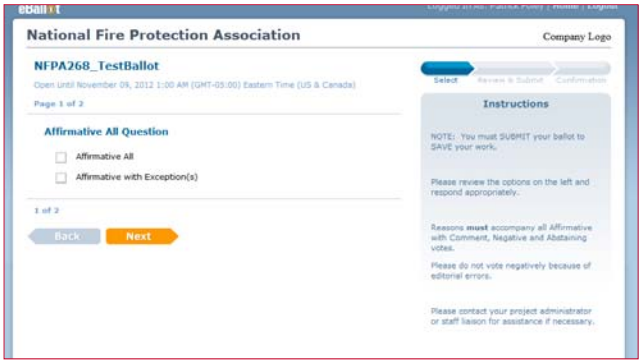
NFPA First Draft Meeting

- Click link provided in ballot email
- Sign in with NFPA.org username and password



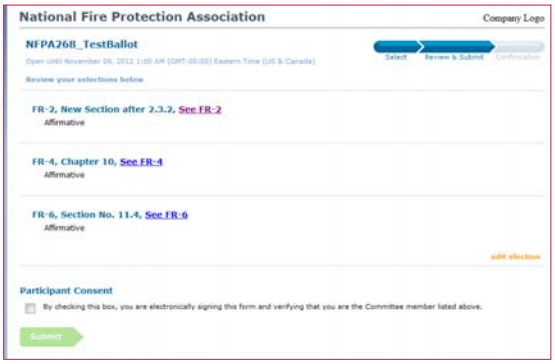
NFPA First Draft Meeting

- Select either 'Affirmative All' or 'Affirmative with Exception(s)'



NFPA First Draft Meeting

- Use “See FR- #” link to review all First Revisions
- Use “edit election” to change individual votes or to modify vote after submitting ballot



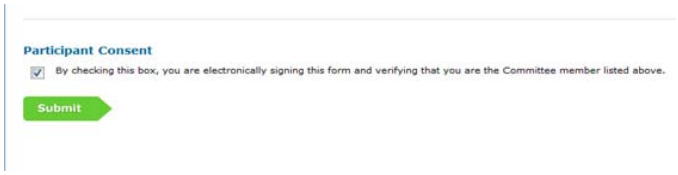
NFPA First Draft Meeting

- Make selection: Affirmative with Comment, Negative, or Abstain
- No selection defaults to affirmative
- Must include comment (reason) on each vote other than Affirmative



NFPA First Draft Meeting

- To complete ballot click Participant Consent and Submit
- Return to edit any votes by ballot due date



NFPA First Draft Meeting

Balloting

- Initial ballot
- Circulation of negatives and comments – electronic balloting is re-opened to permit members to change votes
- Any First Revision that fails ballot becomes a Committee Input (CI)

Legal

Antitrust Matters

- Must comply with state and federal antitrust laws
- Participants are to conduct themselves in strict accordance with these laws
- Read and understand NFPA's Antitrust Policy which can be accessed at nfpa.org/regs

Legal

Antitrust Matters (cont'd)

- Participants must avoid any conduct, conversation or agreement that would constitute an unreasonable restraint of trade
- Conversation topics that are off limits include:
  - Profit, margin, or cost data
  - Prices, rates, or fees
  - Selection, division or allocation of sales territories, markets or customers
  - Refusal to deal with a specific business entity

Legal

Antitrust Matters (cont'd)

- NFPA's standards development activities are based on openness, honesty, fairness and balance
- Participants must adhere to the *Regulations Governing the Development of NFPA Standards* and the *Guide for the Conduct of Participants in the NFPA Standards Development Process* which can accessed at nfpa.org/regs
- Follow guidance and direction from your employer or other organization you may represent

Legal

Antitrust Matters (cont'd)

- Manner is which standards development activity is conducted can be important
- The *Guide of Conduct* requires standards development activity to be conducted with openness, honesty and in good faith
- Participants are not entitled to speak on behalf of NFPA
- Participants must take appropriate steps to ensure their statements whether written or oral and regardless of the setting, are portrayed as personal opinions, not the position of NFPA
- Be sure to ask questions if you have them

Legal

Patents

- Disclosures of essential patent claims should be made by the patent holder
- Patent disclosures should be made early in the process
- Others may also notify NFPA if they believe that a proposed or existing NFPA standard includes an essential patent claim
- NFPA has adopted and follows ANSI's Patent Policy
- It is the obligation of each participant to read and understand NFPA's Patent Policy which can accessed at nfpa.org/regs

THE FIRE PROTECTION RESEARCH FOUNDATION

TC Struggles with an Issue
- TC needs data on a new technology or emerging issue
- Two opposing views on an issue with no real data
- Data presented is not trusted by committee

Code Fund Lends a Hand
- TC rep and/or staff liaison submits a Code Fund Request
- Requests are reviewed by a Panel and chosen based on need / feasibility

Research Project Carried Out
- Funding for project is provided by the Code Fund and/or industry sponsors
- Project is completed and data is available to TC

www.nfpa.org/codefund

Document Information Pages

About	Current and Previous Editions	Next Edition	Technical Committee
• Document scope • Table of contents • Articles • Research and statistical reports • Latest codes and standards news on NFPA Today blog feed • Free access	• Issued TIAs, FIs, Errata • Archived revision information such as meeting and ballot information, First Draft Reports (previously ROPs), Second Draft Reports (previously ROCs), and Standards Council and NITMAM information	• Revision cycle schedule • Posting & closing dates • Submit public input/comments via electronic submission system. • Meeting and ballot information • First Draft Report and Second Draft Report • NITMAM information • Standard Council Decisions • Private TC info (* red asterisk) • Ballot circulations, informational ballots and other committee info	• Committee name and staff liaison • Committee scope and responsibility • Committee list with private information • Committee documents (codes & standards) in PDF format • Committees seeking members • Online committee membership application



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MINUTES

Joint Teleconference / Adobe Connect Meeting of NFPA Correlating Committee on Building Code (BLD-AAC) NFPA Correlating Committee on Safety to Life (SAF-AAC) March 10, 2015

1. **Call to Order.** Teleconference / Adobe Connect meeting called to order by SAF-AAC Chair Bill Koffel at 11:00 a.m. Eastern on March 10, 2015. BLD-AAC Chair Jim Quiter was unable to attend.

2. **Attendance Roll Call.** Staff called the roll of BLD-AAC and SAF-AAC and recorded the members who responded as being present.

   The following members were in attendance:

NAME	COMPANY	BLD-AAC	SAF-AAC
William Koffel	Koffel Associates, Inc.	Non-Voting Member	Chair
Jerry Wooldridge	Reedy Creek Improvement District	Secretary	
Chad Beebe	ASHE – AHA Rep.: TC on Board and Care Facilities	Non-Voting Member	Non-Voting Member
Wayne Carson	Carson Associates, Inc. Rep.: TC on Fundamentals	Non-Voting Member	Non-Voting Member
Shane Clary	Bay Alarm Company Rep.: Signaling Systems Correlating Committee Principal: Wayne Moore		Alternate to Non-Voting Member
David Collins	The Preview Group, Inc. Rep.: TC on Means of Egress	Non-Voting Member	Non-Voting Member
John Devlin	Aon Fire Protection Engineering Corp. Rep.: TC on Fire Protection Features	Non-Voting Member	Non-Voting Member
Salvatore DiCristina	Rutgers, The State University of New Jersey Rep.: Bulding Code Development Committee	Principal	
Victor Dubrowski	Code Consultants, Inc. Re.: TC on Educational and Day-Care Occupancies	Non-Voting Member	Non-Voting Member

NAME	COMPANY	BLD-AAC	SAF-AAC
David Frable	US General Services Administration	Principal	
Randy Gaw	Rep.: TC on Detention & Correctional Occupancies	Non-Voting Member	Non-Voting Member
John Harrington	FM Global	Principal	
Howard Hopper	UL LLC	Principal	Principal
Stephen Hrustich	Gwinnett County Fire & Emergency Services Rep.: International Association of Fire Chiefs		Principal
Jonathan Humble	American Iron and Steel Institute	Principal	
Gerald Jones	Rep: Building Seismic Safety Council/Code Resource Support Committee	Principal	
J. Edmund Kalie Jr.	Prince George's County Government		Principal
Gary Keith	FM Global Principal: John Harrington	Alternate	
David P. Klein	US Department of Veteran Affairs Rep.: TC on Health Care Occupancies	Non-Voting Member	Non-Voting Member
Amy Murdock	Code Consultants, Inc. Rep.: TC on Mercantile & Business Occupancies	Non-Voting Member	Non-Voting Member
Isaac Papier	Honeywell, Inc. Rep.: National Electrical Manufacturers Association		Principal
Henry Paszczuk	Connecticut Dept. of Public Safety Rep.: TC on Interior Finish & Contents	Non-Voting Member	Non-Voting Member
Ronald Reynolds	Virginia State Fire Marshal's Office Rep.: International Fire Marshals Association		Principal
Eric Rosenbaum	Jensen Hughes Rep.: American Health Care Association		Principal
Faimeen Shah	Vortex Fire Engineering Consultancy	Principal	
Jeffrey Tubbs	Arup Rep.: TC on Assembly Occupancies	Non-Voting Member	Non-Voting Member
Robert Upson	National Fire Sprinkler Association Principal: Jeffrey Hugo		Alternate
Joseph Versteeg	Versteeg Associates Rep.: TC on Alternative Approaches to Life Safety	Non-Voting Member	Non-Voting Member
Leon Vinci	Health Promotion Consultants Rep: American Public Health Association Principal: Jake Pauls	Alternate	

The following members were not in attendance:

NAME	COMPANY	BLD-AAC	SAF-AAC
James Quiter	Arup	Chair	Principal
Sam Francis	American Wood Council	Principal	
Raymond Hansen	US Department of the Air Force	Principal	
John Kampmeyer, Sr.	Triad Fire Protection Engineering Corp.	Principal	
Russell Leavitt	Telgian Corporation Rep.: American Fire Sprinkler Association	Principal	
Michael Newman	Johnson & Johnson Rep.: NFPA Industrial Fire Protection Section	Principal	
Daniel O'Connor	Aon Fire Protection Engineering Rep.: American Hotel & Lodging Association	Principal	
Richard Jay Roberts	Honeywell Life Safety Rep.: National Electrical Manufacturers Association	Principal	

The following guests were in attendance:

NAME	COMPANY
Kristin Bigda	National Fire Protection Association
Ron Coté	National Fire Protection Association
Allan Fraser	National Fire Protection Association
Daniel Gorham	National Fire Protection Association
Gregory Harrington	National Fire Protection Association
Robert Solomon	National Fire Protection Association

3. **Minutes Approval.** Minutes of the BLD-AAC November 8, 2013 and SAF-AAC November 7, 2013 meetings were approved as distributed.

4. **Liaison Reports.**
Sprinkler Project. Bill Koffel presented the sprinkler project liaison report. There were no significant changes being made to NFPA 13, 13D and 13R (vis a vis NFPA 101/5000) in the current revision cycle (Annual 2015). NITMAMS are awaited. The NFPA 13 revisions include re-inserting the sprinkler exemption for apartment unit bathrooms.

Fire Alarm Project. Shane Clary presented the fire alarm project liaison report. There were no significant changes being made to NFPA 72 (vis a vis NFPA 101/5000) in the current revision cycle (Annual 2015). NITMAMS are awaited.

5. **Supplemental Operating Procedures.** SAF-AAC Chair Bill Koffel advised that he and BLD-AAC chair Jim Quiter will appoint a task group to review the supplemental operating procedures; compare its features to the NFPA Regulations Governing the Development of NFPA Standards (Regs); and determine what, if anything, needs to be retained in some form. Correlating committee members were asked to review the procedures; identify any items that need to be retained; and communicate such to staff.

6. **Hazardous Materials – NFPA 101.** The NFPA 101 Hazardous Materials Task Group report was noted as received. Task Group Chair Jeff Tubbs was asked to submit the proposed changes as official Public Input, on behalf of the task group, by the July 6 closing date. Staff advised that the SAF-FUN, SAF-MEA, and SAF-FIR technical committees would each address the portion of the recommended changes that apply to their assigned chapters. Proposed new Annex C (a repository for information on the NFPA documents that address hazardous materials) would be addressed by SAF-FUN. The Correlating Committee would perform any needed correlation among the technical committee actions.

7. **NFPA 101/5000 2018-Edition Work Areas.** The activity / plans updates from the technical committee chairs and the development of subject areas for focus during the 2018 edition revision cycle were handled together. The resulting issues, for consideration by the technical committees, follow:

SUBJECT	NOTES	NFPA 101	NFPA 5000
Glossary of Terms	Direction needed on how to proceed with definitions (on-going)	All TCs based on definition assignments	All TCs based on definition assignments
Resilient design concepts	Emerging topic but may pilot a project for BLD/SAF-HEA in 2015	HEA Other TCs might consider	HEA Other TCs might consider
Hazardous materials in NFPA 101	How should code regulate egress provisions related to health hazards and not just fire? (Jeff Tubbs Task Group)	FUN, MEA, FIR with AAC review	
Hazardous materials in NFPA 5000	Review Chapter 34 provisions for things like dead ends and common path of travel		IND
Smoke compartment size increase in health care	Conditions needed to allow larger compartment size in hospitals/nursing homes	HEA	HEA
CO detection in	Only residential occupancy	BCF	BCF

SUBJECT	NOTES	NFPA 101	NFPA 5000
residential B&C	without CO provisions; Correlating Committee asked earlier for a TIA		
Security/safety/code conflicts (re: schools, in particular)	Should have content to review from 12/2014 School Security/Safety Workshop	FUN re: doc Scope expansion; MEA, END; Other TCs might consider re: active shooter	FUN re: doc Scope expansion; MEA, END; Other TCs might consider re: active shooter
Elevator use	Incorporate the latest and greatest information from ASME	MEA, FUN	BSY, MEA, FUN
Home health care	May consider joint NFPA 99/NFPA 101 project to address durable medical equipment (DME), safety measures, and backup power	HEA, possible co-ordination w/ RES	
Means of egress remoteness	How is remoteness of exit access potentially impacted by vertical openings?	MEA, FIR	MEA, FIR
Exterior wall assemblies and NFPA 285	Review FPRF report (June 2014) and determine if changes needed for NFPA 5000		BLC, SCM
"Life safety" sprinkler systems	Introduce discussion on scope, use and limitations of NFPA 13D and NFPA 13R for: - Other than residential occupancies - 5- and 6-story buildings integrating 'pedestal construction' (13R)	BCF, RES	BCF, RES, BLC
NFPA 13R attic protection	What is expected performance level? Lives saved but building lost	RES, BCF	RES, BCF
Buildings under construction	Evaluate application of NFPA 241 to systems and buildings	FUN	FUN
Term "temporary"	Expand definition to consider use of temporary systems as well as buildings/structures	FUN	FUN

SUBJECT	NOTES	NFPA 101	NFPA 5000
Location, design, hardening of egress stairs based on wind hazard	Avoid stair designs that utilize glass on exterior walls. Alternatively, look at use of ASTM E1886, *Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials*, and/or ASTM E1996, *Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.* See NIST NCST report on Joplin, MO tornado.	FIR, MEA	FIR, MEA, SCM
In-building storm shelter spaces	Add scoping and reference to ANSI/NSSA/ICC 500 for certain occupancies.	Various – incl FUN (Scope); AXM, END, MER	Various – incl FUN (Scope); AXM, END, MER, BLC, SCM
Stair descent devices	Add scoping, how many and where	MEA, Various occupancies	BSY, MEA, Various occupancies
UMC technical review	Close review for "conflicts" with 90A, 90B, and other NFPA documents (e.g., flexible air duct/connector length)	BSF	BSY
Roof egress	New section on egress requirements for roofs with mechanical equipment	MEA	MEA
Private homes/dwellings rented as B&Bs	Trend of private homeowners advertising their home for short stay rentals (airbnb.com) but not licensed or regulated in any way. Might be more of a Pub Ed issue.	RES	RES
Life Safety Evaluation for assembly	Continue the upgrading effort	AXM	AXM

SUBJECT	NOTES	NFPA 101	NFPA 5000
occupancies			
Falls over guards in arenas and stadia	FPRF report	AXM	AXM
Opening protectives (door, windows) ratings	Chair convened a task group	FIR	FIR
Inspection, testing, maintenance (ITM) of fire escape stairs	Consider National Fire Escape Assn materials	MEA	MEA
Day-care age for self-preservation	FPRF report	END	END
Ambulatory health care occupant load factor	2 FPRF reports	HEA	HEA
Apartments for the elderly	Is there a special risk or is special protection needed? Revisit 1981 edition of NFPA 101	RES	RES
Open malls	Chair convened a task group	MER	MER
Evacuation chairs	Scoping and use of RESNA standard		BSY
Accessibility reference updating	2010 ADA; expected update of ANSI A117.1		BSY
Green roofing systems	FM Global has installation data sheet and approval standard		SCM
Tall timber buildings	FPRF report		BLC
Height and area	FPRF compilation, but no objective criteria developed		BLC

8. **Other Business.** No other business was raised.

9. **Next Meeting.** The BLD-AAC and SAF-AAC correlating committees will meet to address NFPA 5000/101 First Draft correlation issues in December 2015 or early January 2016.

10. **Adjournment.** The meeting was adjourned at 12:00 p.m. Eastern.

Minutes prepared by Ron Coté and Kelly Carey

TECHNICAL NOTES

Non-Fire Hazard Provisions in NFPA Codes and Standards: A Literature Review

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About the Fire Protection Research Foundation

The Fire Protection Research Foundation plans, manages, and communicates research on a broad range of fire safety issues in collaboration with scientists and laboratories around the world. The Foundation is an affiliate of NFPA.

About the National Fire Protection Association (NFPA)

NFPA is a worldwide leader in fire, electrical, building, and life safety. The mission of the international nonprofit organization founded in 1896 is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating consensus codes and standards, research, training, and education. NFPA develops more than 300 codes and standards to minimize the possibility and effects of fire and other hazards. All NFPA codes and standards can be viewed at no cost at www.nfpa.org/freeaccess.

Keywords: Non-fire, hazard, life safety

Background

While the scope of NFPA 101, *Life Safety Code,* has typically been focused on building features necessary to minimize danger to life from fire, it also considers non-fire emergencies. Over the last few decades, the NFPA 101 technical committees have considered several proposals that concern the scope of the document relevant to hazards other than fire. However, the extent of non-fire related provisions in NFPA 101 as well as how other NFPA codes and standards address non-fire hazards needs to be better understood. The main objective of this project was to develop a well-organized inventory of the life safety provisions in NFPA 101 and other NFPA codes and standards that related to hazards other than fire.

Literature Review Process

The inventory was conducted by first identifying the NFPA codes and standards containing information and material related to life safety. The codes and standards included in this technical report are as follows:

- NFPA 72: *National Fire Alarm and Signaling Code (2013 edition)*
- NFPA 90A: *Standard for the Installation of Air-Conditioning and Ventilating Systems (2012 edition*)
- NFPA 90B: *Standard for the Installation of Warm Air Heating and Air-Conditioning Systems (2012 edition)*
- NFPA 92: *Standard for Smoke Control Systems (2012 edition)*
- NFPA 99: *Health Care Facilities Code (2012 edition)*
- NFPA 101: *Life Safety Code (2012 edition)*
- NFPA 102: *Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures (2011 edition)*
- NFPA 130: *Standard for Fixed Guideway Transit and Passenger Rail Systems (2014 edition)*
- NFPA 150: *Standard on Fire and Life Safety in Animal Housing Facilities (2013 edition)*
- NFPA 170: *Standard for Fire Safety and Emergency Symbols (2012 edition)*
- NFPA 415: *Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways (2013 edition)*
- NFPA 424: *Guide for Airport/Community Emergency Planning (2013 edition)*
- NFPA 502: *Standard for Road Tunnels, Bridges, and Other Limited Access Highways (2014 edition)*
- NFPA 520: *Standard on Subterranean Spaces (2010 edition)*
- NFPA 610: *Guide for Emergency and Safety Operations at Motorsports Venues (2009 edition)*
- NFPA 909: *Code for the Protection of Cultural Resource Properties (2013 edition)*

- NFPA 1600: *Standard on Disaster/Emergency Management and Business Continuity Programs (2010 edition)*
- NFPA 1620: *Standard for Pre-Incident Planning (2010 edition)*

The focus of the project was on documents that focus on fire safety. NFPA 5000, *Building Construction and Safety Code*, was excluded from this study because it has a much broader scope than fire safety such as structural safety, which is beyond the scope of this project. Additionally, most of the life safety hazards within the provisions of NFPA 5000 are identical to those in NFPA 101. Therefore including these provisions would create redundancy issues for this technical report and inventory of non-fire hazard provisions.

Once these were identified, the next step was to examine each Code and Standard and tag each provision that applied to life safety beyond fire events. For example, such provisions included topics relative to biological hazards, storms, disaster/emergency management systems, crowd movement, and means of egress. It should be noted that the means of egress provisions generally do apply to the safe evacuation of occupants caused by other hazards. However, those general means of egress provisions that also may apply to egress from fire emergencies were not included.

Each Code and Standard is listed in numerical order. The code texts for the non-fire hazard provisions relating to life safety are noted and any related Annex notes are also included.

Summary of Results

The life safety provisions can be placed in three distinct categories: fire, non-fire, and both (fire and non-fire). A vast majority of the noted provisions can be placed in the "both" category. The majority of non-fire hazard provisions found during this project were in NFPA 101, *Life Safety Code*. In addition, several were located in NFPA 1600, *Standard on Disaster/Emergency Management and Business Continuity Programs*. The table below provides a quick overview of the numbers of requirements noted listed by NFPA code and standard.

Table 1: Inventory count for Non-Fire Hazard Provisions

NFPA Code/Standard	# of Non-Fire Hazard Provisions Found
72	4
90A	0
90B	0
92	0
99	1
101	123
102	1
130	14
150	1
170	5
415	0
424	3
502	8
520	0
610	5
909	0
1600	13
1620	7

Altogether, there were 185 non-fire hazard life safety provisions that are documented. Though NFPA 90A, 90B, 92, 415 and 520 did not contain any non-fire hazard provisions of interest, these codes and standards were appropriate to review and the findings of this report can be used in future reports that relate to this particular scope. NFPA 909 states in the earlier sections that it does not relate to life safety and, therefore, contains zero non-fire hazard provisions relating to life safety. The 123 non-fire hazard provisions documented in NFPA 101 are all related to life safety and are either affiliated with means of egress, new buildings, old buildings, crowd movement, situation awareness, emergency planning, carbon monoxide and other non-fire hazards.

NFPA 72: National Fire Alarm and Signaling Code (2013 Edition)		
Section #	**Section Text**	**Annex Text**
Chapter 24: Emergency Communications Systems (ECS) 24.2.1	**24.2 Purpose.** **24.2.1** The systems covered under Chapter 24 are for the protection of life by indicating the existence of an emergency situation and communicating information necessary to facilitate an appropriate response and action.	
24.2.3	**24.2.3** An emergency communications system is intended to communicate information about emergencies including, but not limited to, fire, human-caused events (accidental and intentional), other dangerous situations, accidents, and natural disasters.	
24.4.2.8	**24.4.2.8* Relocation and Partial Evacuation.** The requirements of 24.4.2.8 shall apply only to systems used for relocation or partial evacuation during a fire condition.	**A.24.4.2.8** When a fire or other emergency occurs in a building, the usual goal is to evacuate the occupants or relocate them so that they are not exposed to hazardous conditions. The exception occurs in occupancies using stay-in-place/defend-in-place (SIP/DIP)[1] strategies. It might also be necessary to alert and provide information to trained staff responsible for assisting evacuation or relocation. Figure A.24.4.2.8 shows several key steps in a person's reaction and decision making process [2]. Occupants rarely panic in fire situations [3,4]. The behavior that they adopt is based on the information they have, the perceived threat, and the decisions they make. The entire decision path is full of thought and decisions on the part of the occupant, all of which take time before leading to the development of adaptive behavior. In hindsight, the actions of many occupants in real fires are sometimes less than optimal. However, their decisions might have been the best choices given the information they had. Fire alarm systems that only use audible tones and/or flashing strobe lights impart only one bit of information: fire alarm. It has long been recognized that environments having complex egress situations or high hazard potentials require occupant notification systems that provide more than one bit of information [5]. To reduce the response time of the occupants and to effect the desired behavior, the message should contain several key elements [3,6]. The key elements include the following: (1) Tell occupants what has happened and where (2) Tell occupants what they should do (3) Tell occupants why they should do it

NFPA 72: National Fire Alarm and Signaling Code (2013 Edition)		
Section #	**Section Text**	**Annex Text**
		There does not seem to be any research that has tested actual message content to determine the best way to inform occupants. The problem is that each building and each fire is unique. Messaging is further complicated by the need to give different information to different people, depending on their location relative to the fire, their training, and their physical/mental capabilities. Messages should use positive language and avoid negative instructions that could be misinterpreted due to unintelligible communications. For example, if you want people to leave an area, say so: "A fire has been reported in the area. For your safety, use the stairs to evacuate the area immediately." A bad example is: "The signal tone you have just heard indicated a report of an emergency. If your floor evacuation signal sounds after this message, do not use the elevator, walk to the nearest stairway and leave the floor. While the report is being verified, occupants on other floors should await further instructions." This message is too long, ambiguous, and subject to misunderstanding if not heard clearly. The word "not" might not be heard clearly, or it might be heard to apply to the entire remaining sentence. Similarly, care should be used in selecting and clearly enunciating words such as "fifth" and "sixth," which can sound the same if the system and environment lead to low intelligibility. See A.24.4.1.1 for more information on methodology for improved message content, structure, and intelligibility. Refer to Annex D for more information on speech intelligibility and how it is predicted. Content of the message should be predicated on the building fire safety plan, the nature of the building and its occupants, the design of the fire alarm system, and testing of the occupant reaction to the message. Caution is advised that the fire alarm system operation and message actuation might be initiated by a manual pull station or detector remote from the fire. [1] Schifiliti, R. P., "To Leave or Not to Leave—That is the Question!", National Fire Protection Association, World Fire Safety Congress & Exposition, May 16, 2000, Denver, CO. [2] Ramachandran, G., "Informative Fire Warning Systems," *Fire Technology*, vol. 47, no. 1, February 1991, National Fire Protection Association, 66–81. [3] J., Bryan, "Psychological Variables That May Affect Fire Alarm Design," *Fire Protection Engineering*, Society of Fire Protection Engineers, Issue No. 11, Fall 2001. [4] Proulx, G., "Cool Under Fire," *Fire Protection Engineering*, Society of Fire Protection Engineers, Issue No. 16, Fall 2002. [5] General Services Administration, Proceedings of the Reconvened International Conference on Fire Safety in High Rise Buildings, Washington, D.C., October 1971.

NFPA 72: National Fire Alarm and Signaling Code (2013 Edition)		
Section #	**Section Text**	**Annex Text**
		[6] Proulx, G., "Strategies for Ensuring Appropriate Occupant Response to Fire Alarm Signals," National Research Council of Canada, Ottawa, Ontario, *Construction Technology Update*, No. 43, 1–6, December 2000.
24.4.2.8.5.7	**24.4.2.8.5.7** Paragraphs 24.4.2.8 through 24.4.2.8.5.6 shall not automatically apply when relocation or partial evacuation is of a non-fire emergency unless identified and required by a risk analysis.	

NFPA 90A: Standard for the Installation of Air-Conditioning and Ventilating Systems (2012 Edition)		
Section #	**Section Text**	**Annex Text**
none		

NFPA 90B: Standard for the Installation of Warm Air Heating and Air-Conditioning Systems (2012 Edition)		
Section #	**Section Text**	**Annex Text**
none		

NFPA 92: Standard for Smoke Control Systems (2012 Edition)		
Section #	**Section Text**	**Annex Text**
none		

NFPA 99: Health Care Facilities Code (2012 Edition)		
Section #	**Section Text**	**Annex Text**
Chapter 5: Gas and Vacuum Systems 5.1.3.3.1.5	**5.1 Category 1 Piped Gas and Vacuum Systems.** **5.1.3.3.1.5** Locations shall be chosen to allow access by delivery vehicles and management of cylinders (e.g., proximity to loading docks, access to elevators, and passage of cylinders through public areas). **Note:** Chapter 5 discusses Gas and Vacuum Systems. More specifically, this section relates to Central Supply System Locations and the cylinders are those that contain gas-filled, volatile liquids or some medical gas.	

NFPA 101: Life Safety Code (2012 Edition)		
Section #	**Section Text**	**Annex Text**
Chapter 4: General 4.1	**4.1* Goals.**	**A.4.1** The goals in Section 4.1 reflect the scope of this *Code (see Section 1.1)*. Other fire safety goals that are outside the scope of this *Code* might also need to be considered, such as property protection and continuity of operations. Compliance with this *Code* can assist in meeting goals outside the scope of the *Code*.
4.1.2	**4.1.2* Comparable Emergencies.** An additional goal is to provide life safety during emergencies that can be mitigated using methods comparable to those used in case of fire.	**A.4.1.2** "Comparable emergencies" refers to incidents where the hazard involves thermal attributes similar to fires or airborne contaminants similar to smoke, such that features mandated by this *Code* can be expected to mitigate the hazard. Examples of such incidents might be explosions and hazardous material releases. The *Code* recognizes that features mandated by this *Code* might be less effective against such hazards than against fires.
4.1.3	**4.1.3* Crowd Movement.** An additional goal is to provide for reasonably safe emergency crowd movement and, where required, reasonably safe nonemergency crowd movement.	**A.4.1.3** An assembly occupancy is an example of an occupancy where the goal of providing for reasonably safe emergency and nonemergency crowd movement has applicability. A detention or correctional occupancy is an example of an occupancy where emergency and nonemergency crowd movement is better addressed by detention and correctional facilities specialists than by this *Code*.
4.2.3	**4.2.3 Systems Effectiveness.** Systems utilized to achieve the goals of Section 4.1 shall be effective in mitigating the hazard or condition for which they are being used, shall be reliable, shall be maintained to the level at which they were designed to operate, and shall remain operational.	
4.5.1	**4.5 Fundamental Requirements.** **4.5.1 Multiple Safeguards.** The design of every building or structure intended for human occupancy shall be such that reliance for safety to life does not depend solely on any single safeguard. An additional safeguard(s) shall be provided for life safety in case any single safeguard is ineffective due to inappropriate human actions or system failure.	

NFPA 101: Life Safety Code (2012 Edition)		
Section #	**Section Text**	**Annex Text**
4.5.2	**4.5.2 Appropriateness of Safeguards.** Every building or structure shall be provided with means of egress and other fire and life safety safeguards of the kinds, numbers, locations, and capacities appropriate to the individual building or structure, with due regard to the following: (1) Character of the occupancy, including fire load (2) Capabilities of the occupants (3) Number of persons exposed (4) Fire protection available (5) Capabilities of response personnel (6) Height and construction type of the building or structure (7) Other factors necessary to provide occupants with a reasonable degree of safety	
4.5.3.2	**4.5.3.2 Unobstructed Egress.** In every occupied building or structure, means of egress from all parts of the building shall be maintained free and unobstructed. Means of egress shall be accessible to the extent necessary to ensure reasonable safety for occupants having impaired mobility.	
4.5.3.3	**4.5.3.3 Awareness of Egress System.** Every exit shall be clearly visible, or the route to reach every exit shall be conspicuously indicated. Each means of egress, in its entirety, shall be arranged or marked so that the way to a place of safety is indicated in a clear manner.	

NFPA 101: Life Safety Code (2012 Edition)		
Section #	**Section Text**	**Annex Text**
4.5.5	**4.5.5* Situation Awareness.** Systems used to achieve the goals of Section 4.1 shall be effective in facilitating and enhancing situation awareness, as appropriate, by building management, other occupants and emergency responders of the functionality or state of critical building systems, the conditions that might warrant emergency response, and the appropriate nature and timing of such responses.	**A.4.5.5** Systems encompass facilities or equipment and people. Included are fire/smoke detection, alarm, and communication systems plus the system status panels in emergency command centers; supervisory systems for various especially critical components (e.g., certain valves) of fire protection systems; certain signs; and the availability of trained staff, notably in health care occupancies.
4.5.7	**4.5.7 System Design/Installation.** Any fire protection system, building service equipment, feature of protection, or safeguard provided to achieve the goals of this *Code* shall be designed, installed, and approved in accordance with applicable NFPA standards.	
4.5.8	**4.5.8 Maintenance.** Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, or any other feature is required for compliance with the provisions of this *Code*, such device, equipment, system, condition, arrangement, level of protection, or other feature shall thereafter be maintained, unless the *Code* exempts such maintenance.	
4.6.9.1(3)	**4.6.9.1** No new construction or existing building shall be occupied in whole or in part in violation of the provisions of this *Code*, unless the following conditions exist: (1) A plan of correction has been approved. (2) The occupancy classification remains the same. (3) No serious life safety hazard exists as judged by the authority having jurisdiction.	

NFPA 101: Life Safety Code (2012 Edition)		
Section #	**Section Text**	**Annex Text**
4.6.10.2	**4.6.10.2*** In buildings under construction, adequate escape facilities shall be maintained at all times for the use of construction workers. Escape facilities shall consist of doors, walkways, stairs, ramps, fire escapes, ladders, or other approved means or devices arranged in accordance with the general principles of the *Code* insofar as they can reasonably be applied to buildings under construction.	**A.4.6.10.2** See also NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations*.
4.8.2.1	**4.8.2.1*** Emergency plans shall include the following: (1) Procedures for reporting of emergencies (2) Occupant and staff response to emergencies (3)*Evacuation procedures appropriate to the building, its occupancy, emergencies, and hazards *(see Section 4.3)* (4) Appropriateness of the use of elevators (5) Design and conduct of fire drills (6) Type and coverage of building fire protection systems (7) Other items required by the authority having jurisdiction	**A.4.8.2.1** Items to be considered in preparing an emergency plan should include the following: (1) Purpose of plan (2) Building description, including certificate of occupancy (3) Appointment, organization, and contact details of designated building staff to carry out the emergency duties (4) Identification of events (man-made and natural) considered life safety hazards impacting the building (5) Responsibilities matrix (role-driven assignments) (6) Policies and procedures for those left behind to operate critical equipment (7) Specific procedures to be used for each type of emergency (8) Requirements and responsibilities for assisting people with disabilities (9) Procedures for accounting for employees (10) Training of building staff, building emergency response teams, and other occupants in their responsibilities (11) Documents, including diagrams, showing the type, location, and operation of the building emergency features, components, and systems (12) Practices for controlling life safety hazards in the building (13) Inspection and maintenance of building facilities that provide for the safety of occupants (14) Conducting fire and evacuation drills (15) Interface between key building management and emergency responders (16) Names or job titles of persons who can be contacted for further information or explanation of duties (17) Post-event (including drill) critique/evaluation, as addressed in 5.14 of *NFPA 1600, Standard on Disaster/Emergency Management and Business Continuity Programs* (18) Means to update the plan, as necessary

4.8.2.1(3)		**A.4.8.2.1(3)** It is assumed that a majority of buildings will use a total evacuation strategy during a fire. It should be noted that evacuation from a building could occur for reasons other than a fire, but such other reasons are not the primary focus of the *Code*. As used herein, total evacuation is defined as the process in which all, or substantially all, occupants leave a building or facility in either an unmanaged or managed sequence or order. An alternative to total evacuation is partial evacuation, which can be defined as the process in which a select portion of a building or facility is cleared or emptied of its occupants while occupants in other portions mostly carry on normal activity. In either case, the evacuation process can be ordered or managed in accordance with an established priority in which some or all occupants of a building or facility clear their area and utilize means of egress routes. This is typically done so that the more-endangered occupants are removed before occupants in less-endangered areas. Alternative terms describing this sequencing or ordering of evacuation are *staged evacuation* and *phased evacuation.* Table A.4.8.2.1(3) illustrates options for extent of management and extent of evacuation. Some of the options shown might not be appropriate. As noted in Table A.4.8.2.1(3), either total or partial evacuation can include staged (zoned) evacuation or phased evacuation, which is referred to as managed or controlled evacuation. It should also be noted that the evacuation process might not include relocation to the outside of the building but might instead include relocation to an area of refuge or might defend the occupants in place to minimize the need for evacuation. The different methods of evacuation are also used in several contexts throughout the *Code*. Though most of the methods of evacuation are not specifically defined or do not have established criteria, various sections of the *Code* promulgate them as alternatives to total evacuation. The following sections discuss these alternatives in more detail: (1) Section 4.7—Provides requirements for fire and relocation drills (2) 7.2.12 — Provides requirements for area of refuge (3) 7.2.4 — Provides requirements for horizontal exits (4) 9.6.3.6—Provides the alarm signal requirements for different methods of evacuation (5) 9.6.3.9—Permits automatically transmitted or live voice evacuation or relocation instructions to occupants and requires them in accordance with *NFPA 72, National Fire Alarm and Signaling Code* (6) 14.3.4.2.3 (also Chapter 15)—Describes alternative protection systems in educational occupancies (7) 18.1.1.2/18.1.1.3/Section 18.7 (also Chapter 19)—Provide methods of evacuation for health care occupancies (8) Chapters 22 and 23 — Provide methods of evacuation for detention and correctional occupancies, including the five groups of resident user categories (9) Chapters 32 and 33—Provide method of evacuation for residential board and care occupancies

		(10) 32.1.5/33.1.5—For residential board and care occupancies, state that “no means of escape or means of egress shall be considered as complying with the minimum criteria for acceptance, unless emergency evacuation drills are regularly conducted” (11) 40.2.5.1.2 — For industrial occupancies, states that “ancillary facilities in special-purpose industrial occupancies where delayed evacuation is anticipated shall have not less than a 2-hour fire resistance–rated separation from the predominant industrial occupancy and shall have one means of egress that is separated from the predominant industrial occupancy by 2-hour fire resistance– rated construction” The method of evacuation should be accomplished in the context of the physical facilities, the type of activities undertaken, and the provisions for the capabilities of occupants (and staff, if available). Therefore, in addition to meeting the requirements of the *Code*, or when establishing an equivalency or a performance-based design, the following recommendations and general guidance information should be taken into account when designing, selecting, executing, and maintaining a method of evacuation: (1) When choosing a method of evacuation, the available safe egress time (ASET) must always be greater than the required safe egress time (RSET). (2) The occupants’ characteristics will drive the method of evacuation. For example, occupants might be incapable of evacuating themselves because of age, physical or mental disabilities, physical restraint, or a combination thereof. However, some buildings might be staffed with people who could assist in evacuating. Therefore, the method of evacuation is dependent on the ability of occupants to move as a group, with or without assistance. For more information, see the definitions under the term *Evacuation Capability* in Chapter 3. (3) An alternative method of evacuation might or might not have a faster evacuation time than a total evacuation. However, the priority of evacuation should be such that the occupants in the most danger are given a higher priority. This prioritization will ensure that occupants more intimate with the fire will have a faster evacuation time. (4) Design, construction, and compartmentation are also variables in choosing a method of evacuation. The design, construction, and compartmentation should limit the development and spread of a fire and smoke and reduce the need for occupant evacuation. The fire should be limited to the room or compartment of fire origin. Therefore, the following factors need to be considered: (a) Overall fire resistance rating of the building (b) Fire-rated compartmentation provided with the building (c) Number and arrangement of the means of egress (5) Fire safety systems should be installed that compliment the method of evacuation, and should include consideration of the following:

		(a) Detection of fire (b) Control of fire development (c) Confinement of the effects of fire (d) Extinguishment of fire (e) Provision of refuge or evacuation facilities, or both (6) One of the most important fire safety systems is the fire alarm and communication system, particularly the notification system. The fire alarm system should be in accordance with *NFPA 72, National Fire Alarm and Signaling Code*, and should take into account the following: (a) Initial notification of only the occupants in the affected zone(s) (e.g., zone of fire origin and adjacent zones) (b) Provisions to notify occupants in other unaffected zones to allow orderly evacuation of the entire building (c) Need for live voice communication (d) Reliability of the fire alarm and communication system (7) The capabilities of the staff assisting in the evacuation process should be considered in determining the method of evacuation. (8) The ability of the fire department to interact with the evacuation should be analyzed. It is important to determine if the fire department can assist in the evacuation or if fire department operations hinder the evacuation efforts. (9) Evacuation scenarios for hazards that are normally outside of the scope of the *Code* should be considered to the extent practicable. (*See 4.3.1.*) (10) Consideration should be given to the desire of the occupants to self-evacuate, especially if the nature of the building or the fire warrants evacuation in the minds of the occupants. Self-evacuation might also be initiated by communication between the occupants themselves through face-to-face contact, mobile phones, and so forth. (11) An investigation period, a delay in the notification of occupants after the first activation of the fire alarm, could help to reduce the number of false alarms and unnecessary evacuations. However, a limit to such a delay should be established before a general alarm is sounded, such as positive alarm sequence, as defined in *NFPA 72, National Fire Alarm and Signaling Code*. (12) Consideration should be given to the need for an evacuation that might be necessary for a scenario other than a fire (e.g., bomb threat, earthquake). (13) Contingency plans should be established in the event the fire alarm and communication system fail, which might facilitate the need for total evacuation. (14) The means of egress systems should be properly maintained to ensure the dependability of the method of evacuation. (15) Fire prevention policies or procedures, or both, should be implemented that reduce the chance of a fire (e.g., limiting smoking or providing fire-safe trash cans). (16) The method of evacuation should be properly documented, and written forms of communication should

		be provided to all of the occupants, which might include sign postings throughout the building. Consideration should be given to the development of documentation for an operation and maintenance manual or a fire emergency plan, or both. (17) Emergency egress drills should be performed on a regular basis. For more information, see Section 4.7 . (18) The authority having jurisdiction should also be consulted when developing the method of evacuation. Measures should be in place and be employed to sequence or control the order of a total evacuation, so that such evacuations proceed in a reasonably safe, efficient manner. Such measures include special attention to the evacuation capabilities and needs of occupants with disabilities, either permanent or temporary. For comprehensive guidance on facilitating life safety for such populations, go to www.nfpa.org. For specific guidance on stair descent devices, see A.7.2.12.2.3(2). In larger buildings, especially high-rise buildings, it is recommended that all evacuations — whether partial or total — be managed to sequence or control the order in which certain occupants are evacuated from their origin areas and to make use of available means of egress. In high-rise buildings, the exit stairs, at any level, are designed to accommodate the egress flow of only a very small portion of the occupants — from only one or a few stories, and within a relatively short time period—on the order of a few minutes. In case of a fire, only the immediately affected floor(s) should be given priority use of the means of egress serving that floor(s). Other floors should then be given priority use of the means of egress, depending on the anticipated spread of the fire and its combustion products and for the purpose of clearing certain floors to facilitate eventual fire service operations. Typically, this means that the one or two floors above and below a fire floor will have secondary priority immediately after the fire floor. Depending on where combustion products move, for example, upwards through a building with cool-weather stack effect, the next priority floors will be the uppermost occupied floors in the building. Generally, in order to minimize evacuation time for most or all of a relatively tall building to be evacuated, occupants from upper floors should have priority use of exit stairs. For people descending many stories of stairs, this priority will maximize their opportunity to take rest stops without unduly extending their overall time to evacuate a building. Thus, the precedence behavior of evacuees should be that people already in an exit stair should normally not defer to people attempting to enter the exit stair from lower floors, except for those lower floors most directly impacted by a fire or other imminent danger. Notably, this is contrary to the often observed behavior of evacuees in high-rise building evacuations where lower floor precedence behavior occurs. (Similarly, in the most commonly observed behavior of people normally disembarking a passenger airliner, people within the aisle defer to people entering the aisle, so that

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		the areas closest to the exit typically clear first.) Changing, and generally managing, the sequence or order in which egress occurs will require effectively informing building occupants and evaluating resulting performance in a program of education, training, and drills. When designing the method of evacuation for a complex building, all forms of egress should be considered. For example, consideration could be given to an elevator evacuation system. An elevator evacuation system involves an elevator design that provides protection from fire effects so that elevators can be used safely for egress. See 7.2.13 and A.7.2.12.2.4 for more information. For further guidance, see the following publications: (1) *NFPA Fire Protection Handbook*, 19th edition, Section 2, Chapter 2, which provides good methodology for managing exposures and determining the method of evacuation (2) *NFPA Fire Protection Handbook*, 19th edition, Section 13, which provides further commentary on methods of evacuation for different occupancies (3) *SFPE Handbook of Fire Protection Engineering*, Section 3, Chapter 13, which provides an overview of some of the research on methods of evacuation
4.8.2.2	**4.8.2.2** Required emergency plans shall be submitted to the authority having jurisdiction for review.	
4.8.2.3	**4.8.2.3** Emergency plans shall be reviewed and updated as required by the authority having jurisdiction.	
Chapter 7: Means of Egress 7.1.10.1	**7.1 General.** **7.1.10 Means of Egress Reliability.** **7.1.10.1* General.** Means of egress shall be continuously maintained free of all obstructions or impediments to full instant use in the case of fire or other emergency.	**A.7.1.10.1** A proper means of egress allows unobstructed travel at all times. Any type of barrier including, but not limited to, the accumulations of snow and ice in those climates subject to such accumulations is an impediment to free movement in the means of egress. Another example of an obstruction or impediment to full instant use of means of egress is any security device or system that emits any medium that could obscure a means of egress. It is, however, recognized that obstructions occur on a short-duration basis. In these instances, awareness training should be provided to ensure that blockages are kept to a minimum and procedures are established for the control and monitoring of the area affected.

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7.14.2.1	**7.14 Elevators for Occupant-Controlled Evacuation Prior to Phase I Emergency Recall Operations.** **7.14.2 Occupant Information Features.** **7.14.2.1*** An emergency plan approved by the authority having jurisdiction shall be implemented, specifically including the procedures for occupant evacuation using the exit stairs and the occupant evacuation elevators.	**A.7.14.2.1** Building occupants have traditionally been taught not to use elevators in fire or similar emergencies. The emergency plan should include more than notification that the elevators can be used for emergency evacuation. The plan should include training to make occupants aware that the elevators will be available only for the period of time prior to elevator recall via smoke detection in the elevator lobby, elevator machine room, or elevator hoistway. Occupants should be prepared to use the exit stairs (which are required to be directly accessible from the elevator lobby by 7.14.8.3) where the elevator has been called out of service.
Chapter 9: Building Service and Fire Protection Equipment 9.6.3.6.2	**9.6.3 Occupant Notification.** **9.6.3.6.2*** Where total evacuation of occupants is impractical due to building configuration, only the occupants in the affected zones shall be notified initially. Provisions shall be made to selectively notify occupants in other zones to afford orderly evacuation of the entire building.	**A.9.6.3.6.2** To approve an evacuation plan to selectively notify building occupants, the authority having jurisdiction should consider several building parameters, including building compartmentation, detection and suppression system zones, occupant loads, and the number and arrangement of the means of egress. In high-rise buildings, it is typical to evacuate the fire floor, the floor(s) above, and the floor immediately below. Other areas are then evacuated as the fire develops.
9.6.3.6.3	**9.6.3.6.3** Where occupants are incapable of evacuating themselves because of age, physical or mental disabilities, or physical restraint, the private operating mode, as described in *NFPA72, National Fire Alarm and Signaling Code*, shall be permitted to be used. Only the attendants and other personnel required to evacuate occupants from a zone, area, floor, or building shall be required to be notified. The notification shall include means to readily identify the zone, area, floor, or building in need of evacuation.	

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9.6.3.9.2	**9.6.3.9.2*** Where permitted by Chapters 11 through 43, automatically transmitted or live voice announcements shall be permitted to be made via a voice communication or public address system that complies with the following: (1) Occupant notification, either live or recorded, shall be initiated at a constantly attended receiving station by personnel trained to respond to an emergency. (2) An approved secondary power supply shall be provided for other than existing, previously approved systems. (3) The system shall be audible above the expected ambient noise level. (4) Emergency announcements shall take precedence over any other use.	**A.9.6.3.9.2** The provisions of 9.6.3.9.2 offer an alternative to the emergency voice alarm and communications system provisions (live voice or recorded voice announcements) of *NFPA 72, National Fire Alarm and Signaling Code.* Occupancies such as large venue assembly occupancies and mercantile mall buildings are occupancies in which the physical configuration (e.g., large volume spaces), function, and human behavior (including elevated levels of occupant-generated noise) present challenges with respect to effective occupant notification by standard means in accordance with *NFPA 72*. Because the routine operation of these occupancies demands highly reliant, acoustically capable, and sufficiently audible public address systems, properly trained staff can be relied on to use these public address systems to effect occupant evacuation, relocation, or both. As 9.6.3.9.2 specifically permits an alternative means of notification to that prescribed by *NFPA 72*, it does not mandate that the secondary power supply and the intelligibility and audibility facets of the public address system comply with *NFPA 72* or suggest that equivalency with the related provisions of *NFPA72* is required. However, it is anticipated that, when approving the secondary power and audibility capabilities of public address systems, authorities having jurisdiction will ensure that these systems are conceptually comparable to the emergency voice alarm and communications system provisions of *NFPA 72*, such that a reliable and effective occupant notification system is provided.
9.6.3.10.1	**9.6.3.10.1** Audible and visible fire alarm notification appliances shall be used only for fire alarm system or other emergency purposes.	
9.6.3.10.2	**9.6.3.10.2** Emergency voice/alarm communication systems shall be permitted to be used for other purposes, subject to the approval of the authority having jurisdiction, if the fire alarm system takes precedence over all other signals, with the exception of mass notification inputs.	

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9.6.4.1	**9.6.4 Emergency Forces Notification.** **9.6.4.1** Where required by another section of this *Code*, emergency forces notification shall be provided to alert the municipal fire department and fire brigade (if provided) of fire or other emergency.	
9.8	**9.8 Carbon Monoxide (CO) Detection and Warning Equipment.** Where required by another section of this *Code*, carbon monoxide (CO) detection and warning equipment shall be provided in accordance with NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment*.	
Chapter 11: Special Structures and High-Rise Buildings 11.2.3.2	**11.2.3.2 Protection from Hazards.** Every open structure, other than those structures with only occasional occupancy, shall have automatic, manual, or other protection that is appropriate to the particular hazard and that is designed to minimize danger to occupants in case of fire or other emergency before they have time to use the means of egress.	
11.3.3.2	**11.3.3.2 Protection from Hazards.** Every tower, other than structures with only occasional occupancy, shall have automatic, manual, or other protection that is appropriate to the particular hazard and that is designed to minimize danger to occupants in case of fire or other emergency before they have time to use the means of egress.	

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11.4.3.2	**11.4.3.2 Protection from Hazards.** Every water-surrounded structure, other than structures with only occasional occupancy, shall have automatic, manual, or other protection that is appropriate to the particular hazard and that is designed to minimize danger to occupants in case of fire or other emergency before they have time to use the means of egress.	
11.8.7	**11.8.7 Emergency Plans.** Emergency plans shall be provided in accordance with 4.8.2. **Note: 4.8.2 Plan Requirements.**	
Chapter 12: New Assembly Occupancies 12.2.5.4.2	**12.2.5.4 General Requirements for Access and Egress Routes Within Assembly Areas.** **12.2.5.4.2*** Access and egress routes shall be maintained so that any individual is able to move without undue hindrance, on personal initiative and at any time, from an occupied position to the exits.	**A.12.2.5.4.2** This requirement and the associated requirement of 12.2.5.4.3 have the effect of prohibiting festival seating, unless it truly is a form of seating, such as lawn seating, where generous spaces are commonly maintained between individuals and small groups so that people can circulate freely at any time. Such lawn seating is characterized by densities of about one person per 15 ft2 (1.4 m2). Both requirements prohibit uncontrolled crowd situations, such as in front of stages at rock music concerts where the number and density of people is uncontrolled by architectural or management features.
12.2.5.4.3	**12.2.5.4.3*** Access and egress routes shall be maintained so that crowd management, security, and emergency medical personnel are able to reach any individual at any time, without undue hindrance.	**A.12.2.5.4.3** This requirement is intended to facilitate rapid emergency access to individuals who are experiencing a medical emergency, especially in the case of cardiopulmonary difficulties, where there is a need for rapid medical attention from trained personnel. The requirement also addresses the need for security and law enforcement personnel to reach individuals whose behavior is endangering themselves and others.

12.4.1.1	**12.4 Special Provisions.** **12.4.1 Life Safety Evaluation.** **12.4.1.1*** Where a life safety evaluation is required by other provisions of the *Code*, it shall comply with all of the following: (1) The life safety evaluation shall be performed by persons acceptable to the authority having jurisdiction. (2) The life safety evaluation shall include a written assessment of safety measures for conditions listed in 12.4.1.2. (3) The life safety evaluation shall be approved annually by the authority having jurisdiction and shall be updated for special or unusual conditions.	**A.12.4.1.1** Life safety evaluations are examples of performance based approaches to life safety. In this respect, significant guidance in the form and process of life safety evaluations is provided by Chapter 5, keeping in mind the fire safety emphasis in Chapter 5. Performance criteria, scenarios, evaluation, safety factors, documentation, maintenance, and periodic assessment (including a warrant of fitness) all apply to the broader considerations in a life safety evaluation. A life safety evaluation deals not only with fire but also with storms, collapse, crowd behavior, and other related safety considerations for which a checklist is provided in A.12.4.1.3. Chapter 5 provides guidance, based on fire safety requirements, for establishing a documented case showing that products of combustion in all conceivable fire scenarios will not significantly endanger occupants using means of egress in the facility (e.g., due to fire detection, automatic suppression, smoke control, large-volume space, or management procedures). Moreover, means of egress facilities plus facility management capabilities should be adequate to cope with scenarios where certain egress routes are blocked for some reason. In addition to making realistic assumptions about the capabilities of persons in the facility (e.g., an assembled crowd including many disabled persons or persons unfamiliar with the facility), the life safety evaluation should include a factor of safety of not less than 2.0 in all calculations relating to hazard development time and required egress time (the combination of flow time and other time needed to detect and assess an emergency condition, initiate egress, and move along the egress routes). The factor of safety takes into account the possibility that half of the egress routes might not be used (or be usable) in certain situations. Regarding crowd behavior, the potential hazards created by larger masses of people and greater crowd densities (which can be problematic during ingress, occupancy, and egress) demand that technology be used by designers, managers, and authorities responsible for buildings to compensate for the relaxed egress capacity provisions of Table 12.4.2.3. In very large buildings for assembly use, the hazard of crowd crushes can exceed that of fire or structural failure. Therefore, the building designers, managers, event planners, security personnel, police authorities, and fire authorities, as well as the building construction authorities, should understand the potential problems and solutions, including coordination of their activities. For crowd behavior, this understanding includes factors of space, energy, time, and information, as well as specific crowd management techniques, such as metering. Published guidance on these factors and techniques is found in the *SFPE Handbook of Fire Protection Engineering*, Section 3, Chapter 13, pp. 3-342–3-366 (Proulx, G., “Movement of People”), and the

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		publications referenced therein. Table 12.2.3.2 and Table 12.4.2.3 are based on a linear relationship between number of seats and nominal flow time, with not less than 200 seconds (3.3 minutes) for 2000 seats plus 1 second for every additional 50 seats up to 25,000. Beyond 25,000 total seats, the nominal flow time is limited to 660 seconds (11 minutes). Nominal flow time refers to the flow time for the most able group of patrons; some groups less familiar with the premises or less able groups might take longer to pass a point in the egress system. Although three or more digits are noted in the tables, the resulting calculations should be assumed to provide only two significant figures of precision.
12.4.1.2	**12.4.1.2** Life safety evaluations shall include an assessment of all of the following conditions and related appropriate safety measures: (1) Nature of the events and the participants and attendees (2) Access and egress movement, including crowd density problems (3) Medical emergencies (4) Fire hazards (5) Permanent and temporary structural systems (6) Severe weather conditions (7) Earthquakes (8) Civil or other disturbances (9) Hazardous materials incidents within and near the facility (10) Relationships among facility management, event participants, emergency response agencies, and others having a role in the events accommodated in the facility	

12.4.1.3	**12.4.1.3*** Life safety evaluations shall include assessments of both building systems and management features upon which reliance is placed for the safety of facility occupants, and such assessments shall consider scenarios appropriate to the facility.	**A.12.4.1.3** Factors to be considered in a life safety evaluation include the following: (1) Nature of the events being accommodated, including the following: (a) Ingress, intra-event movement, and egress patterns (b) Ticketing and seating policies/practices (c) Event purpose (e.g., sports contest, religious meeting) (d) Emotional qualities (e.g., competitiveness) of event (e) Time of day when event is held (f) Time duration of single event (g) Time duration of attendees' occupancy of the building (2) Occupant characteristics and behavior, including the following: (a) Homogeneity (b) Cohesiveness (c) Familiarity with building (d) Familiarity with similar events (e) Capability (as influenced by factors such as age, physical abilities) (f) Socioeconomic factors (g) Small minority involved with recreational violence (h) Emotional involvement with the event and other occupants (i) Use of alcohol or drugs (j) Food consumption (k) Washroom utilization (3) Management, including the following: (a) Clear, contractual arrangements for facility operation/use as follows: i. Between facility owner and operator ii. Between facility operator and event promoter iii. Between event promoter and performer iv. Between event promoter and attendee v. With police forces vi. With private security services vii. With ushering services (b) Experience with the building (c) Experience with similar events and attendees (d) Thorough, up-to-date operations manual (e) Training of personnel (f) Supervision of personnel (g) Communications systems and utilization (h) Ratios of management and other personnel to attendees (i) Location/distribution of personnel (j) Central command location (k) Rapport between personnel and attendees (l) Personnel support of attendee goals (m) Respect of attendees for personnel due to the following: i. Dress (uniform) standards ii. Age and perceived experience iii. Personnel behavior, including interaction iv. Distinction between crowd management and control v. Management concern for facility quality (e.g., cleanliness)

		vi. Management concern for entire event experience of attendees (i.e., not just during occupancy of the building) (4) Emergency management preparedness, including the following: (a) Complete range of emergencies addressed in operations manual (b) Power loss (c) Fire (d) Severe weather (e) Earthquake (f) Crowd incident (g) Terrorism (h) Hazardous materials (i) Transportation accident (e.g., road, rail, air) (j) Communications systems available (k) Personnel and emergency forces ready to respond (l) Attendees clearly informed of situation and proper behavior (5) Building systems, including the following: (a) Structural soundness (b) Normal static loads (c) Abnormal static loads (e.g., crowds, precipitation) (d) Dynamic loads (e.g., crowd sway, impact, explosion, wind, earthquake) (e) Stability of nonstructural components (e.g., lighting) (f) Stability of movable (e.g., telescoping) structures (g) Fire protection (h) Fire prevention (e.g., maintenance, contents, housekeeping) (i) Compartmentation (j) Automatic detection and suppression of fire (k) Smoke control (l) Alarm and communications systems (m) Fire department access routes and response capability (n) Structural integrity (o) Weather protection (p) Wind (q) Precipitation (attendees rush for shelter or hold up egress of others) (r) Lightning protection (s) Circulation systems (t) Flowline or network analysis (u) Waywinding and orientation (v) Merging of paths (e.g., precedence behavior) (w) Decision/branching points (x) Route redundancies (y) Counterflow, crossflow, and queuing situations (z) Control possibilities, including metering (aa) Flow capacity adequacy (bb) System balance (cc) Movement time performance (dd) Flow times (ee) Travel times (ff) Queuing times (gg) Route quality

		(hh) Walking surfaces (e.g., traction, discontinuities) (ii) Appropriate widths and boundary conditions (jj) Handrails, guardrails, and other rails (kk) Ramp slopes (ll) Step geometries (mm) Perceptual aspects (e.g., orientation, signage, marking, lighting, glare, distractions) (nn) Route choices, especially for vertical travel (oo) Resting/waiting areas (pp) Levels of service (overall crowd movement quality) (qq) Services (rr) Washroom provision and distribution (ss) Concessions (tt) First aid and EMS facilities (uu) General attendee services A scenario-based approach to performance-based fire safety is addressed in Chapter 5. In addition to using such scenarios and, more generally, the attention to performance criteria, evaluation, safety factors, documentation, maintenance, and periodic assessment required when the Chapter 5 option is used, life safety evaluations should consider scenarios based on characteristics important in assembly occupancies. These characteristics include the following: (1) Whether there is a local or mass awareness of an incident, event, or condition that might provoke egress (2) Whether the incident, event, or condition stays localized or spreads (3) Whether or not egress is desired by facility occupants (4) Whether there is a localized start to any egress or mass start to egress (5) Whether exits are available or not available Examples of scenarios and sets of characteristics that might occur in a facility follow. *Scenario 1*. Characteristics: mass start, egress desired (by management and attendees), exits not available, local awareness. Normal egress at the end of an event occurs just as a severe weather condition induces evacuees at the exterior doors to retard or stop their egress. The backup that occurs in the egress system is not known to most evacuees, who continue to press forward, potentially resulting in a crowd crush. *Scenario 2.* Characteristics: mass start, egress not desired (by management), exits possibly not available, mass awareness. An earthquake occurs during an event. The attendees are relatively safe in the seating area. The means of egress outside the seating area are relatively unsafe and vulnerable to aftershock damage. Facility management discourages mass egress until the means of egress can be checked and cleared for use. *Scenario 3.* Characteristics: local start, incident stays local, egress desired (by attendees and management), exits available, mass awareness. *Scenario 4.* Characteristics: mass start, egress desired (by attendees), incident spreads, exits not available, mass awareness. In an open-air facility unprotected from wind, precipitation, and lightning, sudden severe weather prompts egress to shelter, but not

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		from the facility. The means of egress congest and block quickly as people in front stop once they are under shelter, while people behind them continue to press forward, potentially resulting in a crowd crush. These scenarios illustrate some of the broader factors to be taken into account when assessing the capability of both building systems and management features on which reliance is placed in a range of situations, not just fire emergencies. Some scenarios also illustrate the conflicting motivations of management and attendees, based on differing perceptions of danger and differing knowledge of hazards, countermeasures, and capabilities. Mass egress might not be the most appropriate life safety strategy in some scenarios, such as Scenario 2. Table A.12.4.1.3 summarizes the characteristics in the scenarios and provides a framework for developing other characteristics and scenarios that might be important for a particular facility, hazard, occupant type, event, or management.
12.7.6.1	**12.7.6* Crowd Managers.** **12.7.6.1** Assembly occupancies shall be provided with a minimum of one trained crowd manager or crowd manager supervisor. Where the occupant load exceeds 250, additional trained crowd managers or crowd manager supervisors shall be provided at a ratio of one crowd manager or crowd manager supervisor for every 250 occupants, unless otherwise permitted by one of the following: (1) This requirement shall not apply to assembly occupancies used exclusively for religious worship with an occupant load not exceeding 2000. (2) The ratio of trained crowd managers to occupants shall be permitted to be reduced where, in the opinion of the authority having jurisdiction, the existence of an approved, supervised automatic sprinkler system and the nature of the event warrant.	
12.7.6.2	**12.7.6.2** The crowd manager shall receive approved training in crowd management techniques.	

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12.7.7.1	**12.7.7* Drills.** **12.7.7.1** The employees or attendants of assembly occupancies shall be trained and drilled in the duties they are to perform in case of fire, panic, or other emergency to effect orderly exiting.	
12.7.7.3	**12.7.7.3*** In the following assembly occupancies, an audible announcement shall be made, or a projected image shall be shown, prior to the start of each program that notifies occupants of the location of the exits to be used in case of a fire or other emergency: (1) Theaters (2) Motion picture theaters (3) Auditoriums (4) Other similar assembly occupancies with occupant loads exceeding 300 where there are noncontinuous programs	**A.12.7.7.3** It is not the intent of this provision to require an announcement in bowling alleys, cocktail lounges, restaurants, or places of worship.
12.7.13.1	**12.7.13 Emergency Plans.** **12.7.13.1** Emergency plans shall be provided in accordance with Section 4.8.	
12.7.13.2	**12.7.13.2** Where assembly occupancies are located in the high-rise portion of a building, the emergency plan shall include egress procedures, methods, and preferred evacuation routes for each event considered to be a life safety hazard that could impact the building, including the appropriateness of the use of elevators.	

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Chapter 13: Existing Assembly Occupancies 13.1.1.4	**13.1.1.4** An existing building housing an assembly occupancy established prior to the effective date of this *Code* shall be permitted to be approved for continued use if it conforms to, or is made to conform to, the provisions of this *Code* to the extent that, in the opinion of the authority having jurisdiction, reasonable life safety against the hazards of fire, explosion, and panic is provided and maintained.	

13.4.1.1	**13.4 Special Provisions.** **13.4.1 Life Safety Evaluation.** **13.4.1.1*** Where a life safety evaluation is required by other provisions of the *Code*, it shall comply with all of the following: (1) The life safety evaluation shall be performed by persons acceptable to the authority having jurisdiction. (2) The life safety evaluation shall include a written assessment of safety measures for conditions listed in 13.4.1.2. (3) The life safety evaluation shall be approved annually by the authority having jurisdiction and shall be updated for special or unusual conditions.	**A.13.4.1.1** Life safety evaluations are examples of performance based approaches to life safety. In this respect, significant guidance in the form and process of life safety evaluations is provided by Chapter 5, keeping in mind the fire safety emphasis in Chapter 5. Performance criteria, scenarios, evaluation, safety factors, documentation, maintenance, and periodic assessment (including a warrant of fitness) all apply to the broader considerations in a life safety evaluation. A life safety evaluation deals not only with fire but also with storms, collapse, crowd behavior, and other related safety considerations for which a checklist is provided in A.13.4.1.3. Chapter 5 provides guidance, based on fire safety requirements, for establishing a documented case showing that products of combustion in all conceivable fire scenarios will not significantly endanger occupants using means of egress in the facility (e.g., due to fire detection, automatic suppression, smoke control, large-volume space, or management procedures). Moreover, means of egress facilities plus facility management capabilities should be adequate to cope with scenarios where certain egress routes are blocked for some reason. In addition to making realistic assumptions about the capabilities of persons in the facility (e.g., an assembled crowd including many disabled persons or persons unfamiliar with the facility), the life safety evaluation should include a factor of safety of not less than 2.0 in all calculations relating to hazard development time and required egress time (the combination of flow time and other time needed to detect and assess an emergency condition, initiate egress, and move along the egress routes). This factor of safety takes into account the possibility that half of the egress routes might not be used (or usable) in certain situations. Regarding crowd behavior, the potential hazards created by larger masses of people and greater crowd densities (which can be problematic during ingress, occupancy, and egress) demand that technology be used by designers, managers, and authorities responsible for buildings to compensate for the relaxed egress capacity provisions of Table 13.4.2.3. In very large buildings for assembly use, the hazard of crowd crushes can exceed that of fire or structural failure. Therefore, the building designers, managers, event planners, security personnel, police authorities, and fire authorities, as well as the building construction authorities, should understand the potential problems and solutions, including coordination of their activities For crowd behavior, this understanding includes factors of space, energy, time, and information, as well as specific crowd management techniques, such as metering. Published guidance on these factors and techniques is found in the *SFPE Handbook of Fire Protection Engineering,* Section 3, Chapter 13, pp. 3-342–3-366 (Proulx, G., "Movement of People"), and the publications referenced therein. Table 13.2.3.2 and Table 13.4.2.3 are based on a linear relationship between number of seats and nominal flow

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		time, with not less than 200 seconds (3.3 minutes) for 2000 seats plus 1 second for every additional 50 seats up to 25,000. Beyond 25,000 total seats, the nominal flow time is limited to 660 seconds (11 minutes). Nominal flow time refers to the flow time for the most able group of patrons; some groups less familiar with the premises or less able groups might take longer to pass a point in the egress system. Although three or more digits are noted in the tables, the resulting calculations should be assumed to provide only two significant figures of precision.
13.4.1.2	**13.4.1.2** Life safety evaluations shall include an assessment of all of the following conditions and the related appropriate safety measures: (1) Nature of the events and the participants and attendees (2) Access and egress movement, including crowd density problems (3) Medical emergencies (4) Fire hazards (5) Permanent and temporary structural systems (6) Severe weather conditions (7) Earthquakes (8) Civil or other disturbances (9) Hazardous materials incidents within and near the facility (10) Relationships among facility management, event participants, emergency response agencies, and others having a role in the events accommodated in the facility	

13.4.1.3	**13.4.1.3*** Life safety evaluations shall include assessments of both building systems and management features upon which reliance is placed for the safety of facility occupants, and such assessments shall consider scenarios appropriate to the facility.	**A.13.4.1.3** Factors to be considered in a life safety evaluation might include the following: (1) Nature of the events being accommodated, including the following: (a) Ingress, intra-event movement, and egress patterns (b) Ticketing and seating policies/practices (c) Event purpose (e.g., sports contest, religious meeting) (d) Emotional qualities (e.g., competitiveness) of event (e) Time of day when event is held (f) Time duration of single event (g) Time duration of attendees' occupancy of the building (2) Occupant characteristics and behavior, including the following: (a) Homogeneity (b) Cohesiveness (c) Familiarity with building (d) Familiarity with similar events (e) Capability (as influenced by factors such as age, physical abilities) (f) Socioeconomic factors (g) Small minority involved with recreational violence (h) Emotional involvement with the event and other occupants (i) Use of alcohol or drugs (j) Food consumption (k) Washroom utilization (3) Management, including the following: (a) Clear, contractual arrangements for facility operation/use as follows: i. Between facility owner and operator ii. Between facility operator and event promoter iii. Between event promoter and performer iv. Between event promoter and attendee v. With police forces vi. With private security services vii. With ushering services (b) Experience with the building (c) Experience with similar events and attendees (d) Thorough, up-to-date operations manual (e) Training of personnel (f) Supervision of personnel (g) Communications systems and utilization (h) Ratios of management and other personnel to attendees (i) Location/distribution of personnel (j) Central command location (k) Rapport between personnel and attendees (l) Personnel support of attendee goals (m) Respect of attendees for personnel due to the following: i. Dress (uniform) standards ii. Age and perceived experience iii. Personnel behavior, including interaction iv. Distinction between crowd management and control v. Management concern for facility quality (e.g., cleanliness)

		vi. Management concern for entire event experience of attendees (i.e., not just during occupancy of the building) (4) Emergency management preparedness, including the following: (a) Complete range of emergencies addressed in operations manual (b) Power loss (c) Fire (d) Severe weather (e) Earthquake (f) Crowd incident (g) Terrorism (h) Hazardous materials (i) Transportation accident (e.g., road, rail, air) (j) Communications systems available (k) Personnel and emergency forces ready to respond (l) Attendees clearly informed of situation and proper behavior (5) Building systems, including the following: (a) Structural soundness (b) Normal static loads (c) Abnormal static loads (e.g., crowds, precipitation) (d) Dynamic loads (e.g., crowd sway, impact, explosion, wind, earthquake) (e) Stability of nonstructural components (e.g., lighting) (f) Stability of movable (e.g., telescoping) structures (g) Fire protection (h) Fire prevention (e.g., maintenance, contents, housekeeping) (i) Compartmentation (j) Automatic detection and suppression of fire (k) Smoke control (l) Alarm and communications systems (m) Fire department access routes and response capability (n) Structural integrity (o) Weather protection (p) Wind (q) Precipitation (attendees rush for shelter or hold up egress of others) (r) Lightning protection (s) Circulation systems (t) Flowline or network analysis (u) Waywinding and orientation (v) Merging of paths (e.g., precedence behavior) (w) Decision/branching points (x) Route redundancies (y) Counterflow, crossflow, and queuing situations (z) Control possibilities, including metering (aa) Flow capacity adequacy (bb) System balance (cc) Movement time performance (dd) Flow times (ee) Travel times (ff) Queuing times (gg) Route quality

		(hh) Walking surfaces (e.g., traction, discontinuities) (ii) Appropriate widths and boundary conditions (jj) Handrails, guardrails, and other rails (kk) Ramp slopes (ll) Step geometries (mm) Perceptual aspects (e.g., orientation, signage, marking, lighting, glare, distractions) (nn) Route choices, especially for vertical travel (oo) Resting/waiting areas (pp) Levels of service (overall crowd movement quality) (qq) Services (rr) Washroom provision and distribution (ss) Concessions (tt) First aid and EMS facilities (uu) General attendee services A scenario-based approach to performance-based fire safety is addressed in Chapter 5. In addition to utilizing such scenarios and, more generally, the attention to performance criteria, evaluation, safety factors, documentation, maintenance, and periodic assessment required when the Chapter 5 option is used, life safety evaluations should consider scenarios based on characteristics important in assembly occupancies. These characteristics include the following: (1) Whether there is a local or mass awareness of an incident, event, or condition that might provoke egress (2) Whether the incident, event, or condition stays localized or spreads (3) Whether or not egress is desired by facility occupants (4) Whether there is a localized start to any egress or mass start to egress (5) Whether exits are available or not available Examples of scenarios and sets of characteristics that might occur in a facility follow. *Scenario 1*. Characteristics: mass start, egress desired (by management and attendees), exits not available, local awareness. Normal egress at the end of an event occurs just as a severe weather condition induces evacuees at the exterior doors to retard or stop their egress. The backup that occurs in the egress system is not known to most evacuees, who continue to press forward, potentially resulting in a crowd crush. *Scenario 2.* Characteristics: mass start, egress not desired (by management), exits possibly not available, mass awareness. An earthquake occurs during an event. The attendees are relatively safe in the seating area. The means of egress outside the seating area are relatively unsafe and vulnerable to aftershock damage. Facility management discourages mass egress until the means of egress can be checked and cleared for use. *Scenario 3.* Characteristics: local start, incident stays local, egress desired (by attendees and management), exits available, mass awareness. A localized civil disturbance (e.g., firearms violence) provokes localized egress, which is seen by attendees, generally, who then decide to leave also. *Scenario 4.* Characteristics: mass start, egress desired (by attendees), incident spreads, exits not available, mass

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		awareness. In an open-air facility unprotected from wind, precipitation, and lightning, sudden severe weather prompts egress to shelter but not from the facility. The means of egress congest and block quickly as people in front stop once they are under shelter, while people behind them continue to press forward, potentially resulting in a crowd crush. These scenarios illustrate some of the broader factors to be taken into account when assessing the capability of both building systems and management features on which reliance is placed in a range of situations, not just fire emergencies. Some scenarios also illustrate the conflicting motivations of management and attendees based on differing perceptions of danger and differing knowledge of hazards, countermeasures, and capabilities. Mass egress might not be the most appropriate life safety strategy in some scenarios, such as Scenario 2. Table A.13.4.1.3 summarizes the characteristics in the scenarios and provides a framework for developing other characteristics and scenarios that might be important for a particular facility, hazard, occupant type, event, or management.
13.7.6.1	**13.7.6* Crowd Managers.** **13.7.6.1** Assembly occupancies shall be provided with a minimum of one trained crowd manager or crowd manager supervisor. Where the occupant load exceeds 250, additional trained crowd managers or crowd manager supervisors shall be provided at a ratio of one crowd manager or crowd manager supervisor for every 250 occupants, unless otherwise permitted by one of the following: (1) This requirement shall not apply to assembly occupancies used exclusively for religious worship with an occupant load not exceeding 2000. (2) The ratio of trained crowd managers to occupants shall be permitted to be reduced where, in the opinion of the authority having jurisdiction, the existence of an approved, supervised automatic sprinkler system and the nature of the event warrant.	

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13.7.6.2	**13.7.6.2** The crowd manager shall receive approved training in crowd management techniques.	
13.7.7.1	**13.7.7* Drills.** **13.7.7.1** The employees or attendants of assembly occupancies shall be trained and drilled in the duties they are to perform in case of fire, panic, or other emergency to effect orderly exiting.	
13.7.7.3	**13.7.7.3*** In the following assembly occupancies, an audible announcement shall be made, or a projected image shall be shown, prior to the start of each program that notifies occupants of the location of the exits to be used in case of a fire or other emergency: (1) Theaters (2) Motion picture theaters (3) Auditoriums (4) Other similar assembly occupancies with occupant loads exceeding 300 where there are noncontinuous programs	**A.13.7.7.3** It is not the intent of this provision to require an announcement in bowling alleys, cocktail lounges, restaurants, or places of worship.
13.7.13.1	**13.7.13 Emergency Plans.** **13.7.13.1** Emergency plans shall be provided in accordance with Section 4.8.	
13.7.13.2	**13.7.13.2** Where assembly occupancies are located in the high-rise portion of a building, the emergency plan shall include egress procedures, methods, and preferred evacuation routes for each event considered to be a life safety hazard that could impact the building, including the appropriateness of the use of elevators.	

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Chapter 14: New Educational Occupancies 14.7.1	**14.7 Operating Features.** **14.7.1 Emergency Plan.** Emergency plans shall be provided in accordance with Section 4.8.	
14.7.2.1	**14.7.2 Emergency Egress Drills.** **14.7.2.1*** Emergency egress drills shall be conducted in accordance with Section 4.7 and the applicable provisions of 14.7.2.3 as otherwise provided in 14.7.2.2.	**A.14.7.2.1** The requirements are, of necessity, general in scope, as it is recognized that they apply to all types of educational occupancies as well as conditions of occupancies, such as truant schools; schools for the mentally handicapped, vision impaired, hearing impaired, and speech impaired; and public schools. It is fully recognized that no one code can meet all the conditions of the various buildings involved, and it will be necessary for site administrators to issue supplements to these requirements, but all supplements should be consistent with these requirements.
14.7.2.2	**14.7.2.2** Approved training programs designed for education and training and for the practice of emergency egress to familiarize occupants with the drill procedure, and to establish conduct of the emergency egress as a matter of routine, shall be permitted to receive credit on a one-for-one basis for not more than four of the emergency egress drills required by 14.7.2.3, provided that a minimum of four emergency egress drills are completed prior to the conduct of the first such training and practice program.	

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14.7.2.3	**14.7.2.3** Emergency egress drills shall be conducted as follows: (1) Not less than one emergency egress drill shall be conducted every month the facility is in session, unless both of the following criteria are met: (a) In climates where the weather is severe, the monthly emergency egress drills shall be permitted to be deferred. (b) The required number of emergency egress drills shall be conducted, and not less than four shall be conducted before the drills are deferred. (2) All occupants of the building shall participate in the drill. (3) One additional emergency egress drill, other than for educational occupancies that are open on a year-round basis, shall be required within the first 30 days of operation.	
14.7.2.4	**14.7.2.4** All emergency drill alarms shall be sounded on the fire alarm system.	
Chapter 15: Existing Educational Occupancies 15.7.1	**15.7 Operating Features.** **15.7.1 Emergency Plan.** Emergency plans shall be provided in accordance with Section 4.8.	
15.7.2.1	**15.7.2 Emergency Egress Drills.** **15.7.2.1*** Emergency egress drills shall be conducted in accordance with Section 4.7 and the applicable provisions of 15.7.2.3 as otherwise provided by 15.7.2.2.	**A.15.7.2.1** The requirements are, of necessity, general in scope, as it is recognized that they apply to all types of educational occupancies as well as conditions of occupancies, such as truant schools; schools for the mentally handicapped, vision impaired, hearing impaired, and speech impaired; and public schools. It is fully recognized that no one code can meet all the conditions of the various buildings involved, and it will be necessary for site administrators to issue supplements to these requirements, but all supplements should be consistent with these requirements.

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15.7.2.2	**15.7.2.2** Approved training programs designed for education and training and for the practice of emergency egress to familiarize occupants with the drill procedure, and to establish conduct of the emergency egress as a matter of routine, shall be permitted to receive credit on a one-for-one basis for not more than four of the emergency egress drills required by 15.7.2.3, provided that a minimum of four emergency egress drills are completed prior to the conduct of the first such training and practice program.	
15.7.2.3	**15.7.2.3** Emergency egress drills shall be conducted as follows: (1) Not less than one emergency egress drill shall be conducted every month the facility is in session, unless both of the following criteria are met: (a) In climates where the weather is severe, the monthly emergency egress drills shall be permitted to be deferred. (b) The required number of emergency egress drills shall be conducted, and not less than four shall be conducted before the drills are deferred. (2) All occupants of the building shall participate in the drill. (3) One additional emergency egress drill, other than for educational occupancies that are open on a year-round basis, shall be required within the first 30 days of operation.	
15.7.2.4	**15.7.2.4** All emergency drill alarms shall be sounded on the fire alarm system.	

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Chapter 16: New Day-Care Occupancies 16.6.3.4.5	**16.6.3.4 Detection, Alarm, and Communications Systems.** **16.6.3.4.5** Single-station or multiple-station carbon monoxide alarms or detectors shall be provided in accordance with Section 9.8 in day-care homes where client sleeping occurs and one or both of the following conditions exist: (1) Fuel-fired equipment is present. (2) An enclosed parking structure is attached to the day-care home.	

16.7.1	**16.7 Operating Features.** **16.7.1* Emergency Plans.** Emergency plans shall be provided in accordance with Section 4.8.	**A.16.7.1** The requirements are, of necessity, general in scope, because it is recognized that they apply to all types of day-care occupancies as well as conditions of occupancies, such as truant day-care occupancies; occupancies for the mentally handicapped, vision impaired, hearing impaired, and speech impaired; adult day-care; care of infants; and day-care occupancies. It is fully recognized that no one code can meet all the conditions of the various buildings involved, and it will be necessary for site administrators, through the written fire emergency response plan, to issue supplements to these requirements; however, all supplements should be consistent with these requirements. Additionally, it is recommended that fire safety be a part of the educational programs of the occupancy for clients. Fire emergency response plans need to be written and made available to all employees, including temporary or substitute staff, so that all employees know what is expected of them during a fire emergency. The elements needed in the written plan should be identified in coordination with the authority having jurisdiction. The facility fire emergency response plan might be a module of a facility disaster plan that covers other emergencies. The proper safeguarding of clients during a fire emergency requires prompt and effective response by the facility employees in accordance with the fire emergency response plan. Duties covered under the plan should be assigned by position rather than by employee name. Such assignment ensures that, in the absence of an employee, the duties of the position will be performed by a substitute or temporary employee assigned to the position. Temporary or substitute employees should be instructed in advance regarding their duties under the plan for the position to which they are assigned. Written fire emergency response plans should include, but should not be limited to, information for employees regarding methods and devices available for alerting occupants of a fire emergency. Employees should know how the fire department is to be alerted. Even where automatic systems are expected to alert the fire department, the written plan should provide for backup alerting procedures by staff. Other responses of employees to a fire emergency should include the following: (1) Removal of clients in immediate danger to areas of safety, as set forth in the plan (2) Methods of using building features to confine the fire and its byproducts to the room or area of origin (3) Control of actions and behaviors of clients during removal or evacuation activities and at predetermined safe assembly areas The written plan should state clearly the facility policy regarding the actions staff are to take or not take to extinguish a fire. It should also incorporate the emergency egress and relocation drill procedures set forth in 16.7.2. For additional guidance on emergency plans, see *NFPA 1600, Standard on Disaster/Emergency Management and Business Continuity Programs*. This standard establishes a common set of criteria for disaster

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		management, emergency management, and business continuity programs.
16.7.2.1	**16.7.2 Emergency Egress and Relocation Drills.** **16.7.2.1*** Emergency egress and relocation drills shall be conducted in accordance with Section 4.7 and the applicable provisions of 16.7.2.2.	**A.16.7.2.1** The requirements are, of necessity, general in scope, because it is recognized that they apply to all types of day-care occupancies as well as conditions of occupancies, such as truant day-care occupancies; and day-care occupancies for the mentally handicapped, vision impaired, hearing impaired, and speech impaired. It is fully recognized that no one code can meet all the conditions of the various buildings involved, and it will be necessary for site administrators to issue supplements to these requirements, but all supplements should be consistent with these requirements.
16.7.2.2	**16.7.2.2** Emergency egress and relocation drills shall be conducted as follows: (1) Not less than one emergency egress and relocation drill shall be conducted every month the facility is in session, unless both of the following criteria are met: (a) In climates where the weather is severe, the monthly emergency egress and relocation drills shall be permitted to be deferred. (b) The required number of emergency egress and relocation drills shall be conducted, and not less than four shall be conducted before the drills are deferred. (2) All occupants of the building shall participate in the drill. (3) One additional emergency egress and relocation drill, other than for day-care occupancies that are open on a year-round basis, shall be required within the first 30 days of operation.	

Chapter 17: Existing Day-Care Occupancies 17.7.1	**17.7 Operating Features.** **17.7.1* Emergency Plans.** Emergency plans shall be provided in accordance with Section 4.8.	**A.17.7.1** The requirements are, of necessity, general in scope, because it is recognized that they apply to all types of day-care occupancies as well as conditions of occupancies, such as truant day-care occupancies; occupancies for the mentally handicapped, vision impaired, hearing impaired, and speech impaired; adult day-care; care of infants; and day-care occupancies. It is fully recognized that no one code can meet all the conditions of the various buildings involved, and it will be necessary for site administrators, through the written fire emergency response plan, to issue supplements to these requirements; however, all supplements should be consistent with these requirements. Additionally, it is recommended that fire safety be a part of the educational programs of the occupancy for clients. Fire emergency response plans need to be written and made available to all employees, including temporary or substitute staff, so that all employees know what is expected of them during a fire emergency. The elements needed in the written plan should be identified in coordination with the authority having jurisdiction. The facility fire emergency response plan might be a module of a facility disaster plan that covers other emergencies. The proper safeguarding of clients during a fire emergency requires prompt and effective response by the facility employees in accordance with the fire emergency response plan. Duties covered under the plan should be assigned by position rather than by employee name. Such assignment ensures that, in the absence of an employee, the duties of the position will be performed by a substitute or temporary employee assigned to the position. Temporary or substitute employees should be instructed in advance regarding their duties under the plan for the position to which they are assigned. Written fire emergency response plans should include, but should not be limited to, information for employees about methods and devices available for alerting occupants of a fire emergency. Employees should know how the fire department is to be alerted. Even where automatic systems are expected to alert the fire department, the written plan should provide for backup alerting procedures by staff. Other responses of employees to a fire emergency should include the following: (1) Removal of clients in immediate danger to areas of safety, as set forth in the plan (2) Methods of using building features to confine the fire and its byproducts to the room or area of origin (3) Control of actions and behaviors of clients during removal or evacuation activities and at predetermined safe assembly areas The written plan should state clearly the facility policy regarding the actions staff are to take or not take to extinguish a fire. It should also incorporate the emergency egress and relocation drill procedures set forth in 17.7.2. For additional guidance on emergency plans, see *NFPA 1600, Standard on Disaster/Emergency Management and*

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		Business Continuity Programs. This standard establishes a common set of criteria for disaster management, emergency management, and business continuity programs.
17.7.2.1	**17.7.2 Emergency Egress and Relocation Drills.** **17.7.2.1*** Emergency egress and relocation drills shall be conducted in accordance with Section 4.7 and the applicable provisions of 17.7.2.2.	**A.17.7.2.1** The requirements are, of necessity, general in scope, because it is recognized that they apply to all types of day-care occupancies as well as conditions of occupancies, such as truant day-care occupancies; and day-care occupancies for the mentally handicapped, vision impaired, hearing impaired, and speech impaired. It is fully recognized that no one code can meet all the conditions of the various buildings involved, and it will be necessary for site administrators to issue supplements to these requirements, but all supplements should be consistent with these requirements.
17.7.2.2	**17.7.2.2** Emergency egress and relocation drills shall be conducted as follows: (1) Not less than one emergency egress and relocation drill shall be conducted every month the facility is in session, unless both of the following criteria are met: (a) In climates where the weather is severe, the monthly emergency egress and relocation drills shall be permitted to be deferred. (b) The required number of emergency egress and relocation drills shall be conducted, and not less than four shall be conducted before the drills are deferred. (2) All occupants of the building shall participate in the drill. (3) One additional emergency egress and relocation drill, other than for day-care occupancies that are open on a year-round basis, shall be required within the first 30 days of operation.	

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Chapter 18: New Health Care Occupancies 18.7.3.2	**18.7.3 Maintenance of Means of Egress.** **18.7.3.2** Health care occupancies that find it necessary to lock means of egress doors shall, at all times, maintain an adequate staff qualified to release locks and direct occupants from the immediate danger area to a place of safety in case of fire or other emergency.	
Chapter 19: Existing Health Care Occupancies 19.7.3.2	**19.7.3 Maintenance of Means of Egress.** **19.7.3.2** Health care occupancies that find it necessary to lock means of egress doors shall, at all times, maintain an adequate staff qualified to release locks and direct occupants from the immediate danger area to a place of safety in case of fire or other emergency.	
Chapter 20: New Ambulatory Health Care Occupancies 20.7.3.2	**20.7.3 Maintenance of Exits.** **20.7.3.2** Ambulatory health care occupancies that find it necessary to lock exits shall, at all times, maintain an adequate staff qualified to release locks and direct occupants from the immediate danger area to a place of safety in case of fire or other emergency.	
Chapter 21: Existing Ambulatory Health Care Occupancies 21.7.3.2	**21.7.3 Maintenance of Exits.** **21.7.3.2** Ambulatory health care occupancies that find it necessary to lock exits shall, at all times, maintain an adequate staff qualified to release locks and direct occupants from the immediate danger area to a place of safety in case of fire or other emergency.	

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Chapter 24: One- and Two-Family Dwellings 24.3.4.2	**24.3.4.2 Carbon Monoxide and Carbon Monoxide Detection Systems.** **24.3.4.2.1** Carbon monoxide alarms or carbon monoxide detectors in accordance with Section 9.8 and 24.3.4.2 shall be provided in new one- and two-family dwellings where either of the following conditions exists: (1) Dwelling units with communicating attached garages, unless otherwise exempted by 24.3.4.2.3 (2) Dwelling units containing fuel-burning appliances **24.3.4.2.2*** Where required by 24.3.4.2.1, carbon monoxide alarms or carbon monoxide detectors shall be installed in the following locations: (1) Outside of each separate dwelling unit sleeping area in the immediate vicinity of the sleeping rooms (2) On every occupiable level of a dwelling unit, including basements, and excluding attics and crawl spaces **24.3.4.2.3** Carbon monoxide alarms and carbon monoxide detectors as specified in 24.3.4.2.1(1) shall not be required in the following locations: (1) In garages (2) Within dwelling units with communicating attached garages that are open parking structures as defined by the building code (3) Within dwelling units with communicating attached garages that are mechanically ventilated in accordance with the mechanical code	**A.24.3.4.2.2** The placement requirements of NFPA 720, *Standard or the Installation of Carbon Monoxide (CO) Detection and Warning Equipment*, are modified specifically for one- and two family dwellings as required by this *Code* and do not affect other regulations within a jurisdiction.

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Chapter 26: Lodging or Rooming Houses 26.3.4.6	**26.3.4.6 Carbon Monoxide Alarms and Carbon Monoxide Detection Systems.** **26.3.4.6.1** Carbon monoxide alarms or carbon monoxide detectors in accordance with Section 9.8 and 26.3.4.6 shall be provided in new lodging or rooming houses where either of the following conditions exists: (1) Lodging or rooming houses with communicating attached garages, unless otherwise exempted by 26.3.4.6.3 (2) Lodging or rooming houses containing fuel-burning appliances **26.3.4.6.2*** Where required by 26.3.4.6.1, carbon monoxide alarms or carbon monoxide detectors shall be installed in the following locations: (1) Outside of each separate sleeping area in the immediate vicinity of the sleeping rooms (2) On every occupiable level, including basements, and excluding attics and crawl spaces **26.3.4.6.3** Carbon monoxide alarms and carbon monoxide detectors as specified in 26.3.4.6.1(1) shall not be required in the following locations: (1) In garages (2) Within lodging or rooming houses with communicating attached garages that are open parking structures as defined by the building code (3) Within lodging or rooming houses with communicating attached garages that are mechanically ventilated in accordance with the mechanical code	**A.26.3.4.6.2** The placement requirements of NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment*, are modified to accommodate lodging or rooming house occupancies that are part of multiple occupancy buildings (e.g., an on-call physicians' sleeping room in a hospital). The placement requirements of NFPA 720 are modified specifically for lodging or rooming houses as required by this *Code* and do not affect other regulations within a jurisdiction.

Chapter 28: New Hotels and Dormitories 28.3.4.6	**28.3.4.6 Carbon Monoxide Alarms and Carbon Monoxide Detection Systems.** **28.3.4.6.1** Carbon monoxide alarms or carbon monoxide detectors in accordance with Section 9.8 and 28.3.4.6 shall be provided in new hotels and dormitories where either of the following conditions exists: (1) Guest rooms or guest suites with communicating attached garages, unless otherwise exempted by 28.3.4.6.3 (2) Guest rooms or guest suites containing a permanently installed fuel-burning appliance **28.3.4.6.2** Where required by 28.3.4.6.1, carbon monoxide alarms or carbon monoxide detectors shall be installed in the following locations: (1) Outside of each separate guest room or guest suite sleeping area in the immediate vicinity of the sleeping rooms (2) On every occupiable level of a guest room and guest suite **28.3.4.6.3** Carbon monoxide alarms and carbon monoxide detectors as specified in 28.3.4.6.1(1) shall not be required in the following locations: (1) In garages (2) Within guest rooms or guest suites with communicating attached garages that are open parking structures as defined by the building code (3) Within guest rooms or guest suites with communicating attached garages that are mechanically ventilated in accordance with the mechanical code **28.3.4.6.4** Carbon monoxide alarms or carbon monoxide detectors shall be provided in areas other than guest rooms and guest suites in accordance with Section 9.8, as modified by 28.3.4.6.5.	

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	28.3.4.6.5 Carbon monoxide alarms or carbon monoxide detectors shall be installed in accordance with the manufacturer's published instructions in the locations specified as follows: (1) On the ceilings of rooms containing permanently installed fuel-burning appliances (2) Centrally located within occupiable spaces served by the first supply air register from a permanently installed, fuelburning HVAC system (3) Centrally located within occupiable spaces adjacent to a communicating attached garage	
28.4.1.1	**28.4 Special Provisions.** **28.4.1 High-Rise Buildings.** **28.4.1.1** High-rise buildings shall comply with Section 11.8.	
28.4.1.2	**28.4.1.2*** Emergency plans in accordance with Section 4.8 shall be provided and shall include all of the following: (1) Egress procedures (2) Methods (3) Preferred evacuation routes for each event, including appropriate use of elevators	**A.28.4.1.2** See 4.8.2.1(4). **Note: 4.8.2.1*** Emergency plans shall include the following: (4) Appropriateness of the use of elevators
28.7.1.1	**28.7 Operating Features.** **28.7.1 Hotel Emergency Organization.** **28.7.1.1*** Employees of hotels shall be instructed and drilled in the duties they are to perform in the event of fire, panic, or other emergency.	**A.28.7.1.1** Employers are obligated to determine the degree to which employees are to participate in emergency activities. Regulations of the U.S. Department of Labor (OSHA) govern these activities and provide options for employers, from total evacuation to aggressive structural fire fighting by employee brigades. *(For additional information, see 29 CFR 1910, Subparts E and L, "OSHA Regulations for Emergency Procedures and Fire Brigades.")*
28.7.1.2	**28.7.1.2*** Drills of the emergency organization shall be held at quarterly intervals and shall cover such points as the operation and maintenance of the available first aid fire appliances, the testing of devices to alert guests, and a study of instructions for emergency duties.	**A.28.7.1.2** Emergencies should be assumed to have arisen at various locations in the occupancy in order to train employees in logical procedures.

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28.7.5	**28.7.5 Emergency Plans.** Emergency plans in accordance with Section 4.8 shall be provided.	
Chapter 29: Existing Hotels and Dormitories 29.4.1.2	**29.4 Special Provisions.** **29.4.1 High-Rise Buildings.** **29.4.1.2*** Emergency plans in accordance with Section 4.8 shall be provided and shall include all of the following: (1) Egress procedures (2) Methods (3) Preferred evacuation routes for each event, including appropriate use of elevators	**A.29.4.1.2** See 4.8.2.1(4). **Note: 4.8.2.1*** Emergency plans shall include the following: (4) Appropriateness of the use of elevators
29.7.5	**29.7.5 Emergency Plans.** Emergency plans in accordance with Section 4.8 shall be provided.	

Chapter 30: New Apartment Buildings 30.3.4.6	**30.3.4.6 Carbon Monoxide Alarms and Carbon Monoxide Detection Systems.** **30.3.4.6.1** Carbon monoxide alarms or carbon monoxide detectors in accordance with Section 9.8 and 30.3.4.6 shall be provided in new apartment buildings where either of the following conditions exists: (1) Dwelling units with communicating attached garages, unless otherwise exempted by 30.3.4.6.3 (2) Dwelling units containing a permanently installed fuelburning appliance **30.3.4.6.2** Where required by 30.3.4.6.1, carbon monoxide alarms or carbon monoxide detectors shall be installed in the following locations: (1) Outside of each separate dwelling unit sleeping area in the immediate vicinity of the sleeping rooms (2) On every occupiable level of a dwelling unit **30.3.4.6.3** Carbon monoxide alarms and carbon monoxide detectors as specified in 30.3.4.6.1(1) shall not be required in the following locations: (1) In garages (2) Within dwelling units with communicating attached garages that are open parking structures as defined by the building code (3) Within dwelling units with communicating attached garages that are mechanically ventilated in accordance with the mechanical code **30.3.4.6.4** Carbon monoxide alarms or carbon monoxide detectors shall be provided in areas other than dwelling units in accordance with Section 9.8, as modified by 30.3.4.7.5. **30.3.4.6.5** Carbon monoxide alarms or carbon monoxide detectors shall be installed in accordance with the manufacturer's published	

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	instructions in the locations specified as follows: (1) On the ceilings of rooms containing permanently installed fuel-burning appliances (2) Centrally located within occupiable spaces served by the first supply air register from a permanently installed, fuelburning HVAC system (3) Centrally located within occupiable spaces adjacent to a communicating attached garage	
30.4.1.2	**30.4 Special Provisions.** **30.4.1 High-Rise Buildings.** **30.4.1.2*** Emergency plans in accordance with Section 4.8 shall be provided and shall include all of the following: (1) Egress procedures (2) Methods (3) Preferred evacuation routes for each event, including appropriate use of elevators	**A.30.4.1.2** See 4.8.2.1(4). **Note: 4.8.2.1*** Emergency plans shall include the following: (4) Appropriateness of the use of elevators
30.7.1	**30.7 Operating Features.** **30.7.1 Emergency Instructions for Residents of Apartment Buildings.** Emergency instructions shall be provided annually to each dwelling unit to indicate the location of alarms, egress paths, and actions to be taken, both in response to a fire in the dwelling unit and in response to the sounding of the alarm system.	
Chapter 31: Existing Apartment Buildings 31.4.1.2	**31.4 Special Provisions.** **31.4.1 High-Rise Buildings.** **31.4.1.2*** Emergency plans in accordance with Section 4.8 shall be provided and shall include all of the following: (1) Egress procedures (2) Methods (3) Preferred evacuation routes for each event, including appropriate use of elevators	**A.30.4.1.2** See 4.8.2.1(4). **Note: 4.8.2.1*** Emergency plans shall include the following: (4) Appropriateness of the use of elevators

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Chapter 32: New Residential Board and Care Occupancies 32.7.1.1	**32.7 Operating Features.** **32.7.1 Emergency Plan.** **32.7.1.1** The administration of every residential board and care facility shall have, in effect and available to all supervisory personnel, written copies of a plan for protecting all persons in the event of fire, for keeping persons in place, for evacuating persons to areas of refuge, and for evacuating persons from the building when necessary.	
32.7.1.2	**32.7.1.2** The emergency plan shall include special staff response, including the fire protection procedures needed to ensure the safety of any resident, and shall be amended or revised whenever any resident with unusual needs is admitted to the home.	
32.7.1.3	**32.7.1.3** All employees shall be periodically instructed and kept informed with respect to their duties and responsibilities under the plan, and such instruction shall be reviewed by the staff not less than every 2 months.	
32.7.1.4	**32.7.1.4** A copy of the plan shall be readily available at all times within the facility.	
32.7.3.1	**32.7.3 Emergency Egress and Relocation Drills.** **32.7.3.1** Emergency egress and relocation drills shall be conducted not less than six times per year on a bimonthly basis, with not less than two drills conducted during the night when residents are sleeping, as modified by 32.7.3.5 and 32.7.3.6.	
32.7.3.2	**32.7.3.2** The emergency drills shall be permitted to be announced to the residents in advance.	

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32.7.3.3	**32.7.3.3** The drills shall involve the actual evacuation of all residents to an assembly point, as specified in the emergency plan, and shall provide residents with experience in egressing through all exits and means of escape required by the *Code*.	
32.7.3.4	**32.7.3.4** Exits and means of escape not used in any drill shall not be credited in meeting the requirements of this *Code* for board and care facilities.	
32.7.3.5	**32.7.3.5** Actual exiting from windows shall not be required to comply with 32.7.3; opening the window and signaling for help shall be an acceptable alternative.	
32.7.3.6	**32.7.3.6** Residents who cannot meaningfully assist in their own evacuation or who have special health problems shall not be required to actively participate in the drill. Section 18.7 shall apply in such instances.	
Chapter 33: Existing Residential Board and Care Occupancies 33.7.1.1	**33.7 Operating Features.** **33.7.1 Emergency Plan.** **33.7.1.1** The administration of every residential board and care facility shall have, in effect and available to all supervisory personnel, written copies of a plan for protecting all persons in the event of fire, for keeping persons in place, for evacuating persons to areas of refuge, and for evacuating persons from the building when necessary.	
33.7.1.2	**33.7.1.2** The emergency plan shall include special staff response, including the fire protection procedures needed to ensure the safety of any resident, and shall be amended or revised whenever any resident with unusual needs is admitted to the home.	

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33.7.1.3	**33.7.1.3** All employees shall be periodically instructed and kept informed with respect to their duties and responsibilities under the plan, and such instruction shall be reviewed by the staff not less than every 2 months.	
33.7.1.4	**33.7.1.4** A copy of the plan shall be readily available at all times within the facility.	
33.7.3.1	**33.7.3 Emergency Egress and Relocation Drills.** **33.7.3.1** Emergency egress and relocation drills shall be conducted not less than six times per year on a bimonthly basis, with not less than two drills conducted during the night when residents are sleeping, as modified by 33.7.3.5 and 33.7.3.6.	
33.7.3.2	**33.7.3.2** The emergency drills shall be permitted to be announced to the residents in advance.	
33.7.3.3	**33.7.3.3** The drills shall involve the actual evacuation of all residents to an assembly point, as specified in the emergency plan, and shall provide residents with experience in egressing through all exits and means of escape required by this *Code*.	
33.7.3.4	**33.7.3.4** Exits and means of escape not used in any drill shall not be credited in meeting the requirements of this *Code* for board and care facilities.	
33.7.3.5	**33.7.3.5** Actual exiting from windows shall not be required to comply with 33.7.3; opening the window and signaling for help shall be an acceptable alternative.	

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33.7.3.6	**33.7.3.6** If the board and care facility has an evacuation capability classification of impractical, those residents who cannot meaningfully assist in their own evacuation or who have special health problems shall not be required to actively participate in the drill.	
Chapter 36: New Mercantile Occupancies 36.3.4.3.2	**36.3.4.3.2 Emergency Forces Notification.** Emergency forces notification shall be provided and shall include notifying both of the following: (1) Fire department in accordance with 9.6.4 (2) Local emergency organization, if provided	
36.4.4.4.3.3	**36.4.4.4.3.3 Emergency Forces Notification.** Emergency forces notification shall be provided and shall include notifying all of the following: (1) Fire department in accordance with 9.6.4 (2) Local emergency organization, if provided	
36.4.5.4.4	**36.4.5.4.4 Emergency Forces Notification.** Emergency forces notification shall be provided and shall include notifying both of the following: (1) Fire department in accordance with 9.6.4 (2) Local emergency organization, if provided	
36.4.5.6.1	**36.4.5.6 Emergency Plan and Employee Training.** **36.4.5.6.1** There shall be in effect an approved written plan for the emergency egress and relocation of occupants.	
36.4.5.6.2	**36.4.5.6.2** All employees shall be instructed and periodically drilled with respect to their duties under the plan.	

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Section #	**Section Text**	**Annex Text**
36.7.1	**36.7 Operating Features.** **36.7.1 Emergency Plans.** Emergency plans complying with Section 4.8 shall be provided in high-rise buildings.	
36.7.2	**36.7.2 Drills.** In every Class A or Class B mercantile occupancy, employees shall be periodically trained in accordance with Section 4.7.	
Chapter 37: Existing Mercantile Occupancies 37.3.4.3.2	**37.3.4.3.2 Emergency Forces Notification.** Emergency forces notification shall be provided and shall include notifying both of the following: (1) Fire department in accordance with 9.6.4 (2) Local emergency organization, if provided	
37.4.4.4.3.3	**37.4.4.4.3.3 Emergency Forces Notification.** Emergency forces notification shall be provided and shall include notifying all of the following: (1) Fire department in accordance with 9.6.4 (2) Local emergency organization, if provided	
37.4.5.4.4	**37.4.5.4.4 Emergency Forces Notification.** Emergency forces notification shall be provided and shall include notifying both of the following: (1) Fire department in accordance with 9.6.4 (2) Local emergency organization, if provided	
37.4.5.6.1	**37.4.5.6 Emergency Plan and Employee Training.** **37.4.5.6.1** There shall be in effect an approved written plan for the emergency egress and relocation of occupants.	

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37.4.5.6.2	**37.4.5.6.2** All employees shall be instructed and periodically drilled with respect to their duties under the plan.	
37.7.1	**37.7 Operating Features.** **37.7.1 Emergency Plans.** Emergency plans complying with Section 4.8 shall be provided in high-rise buildings.	
37.7.2	**37.7.2 Drills.** In every Class A or Class B mercantile occupancy, employees shall be periodically trained in accordance with Section 4.7.	
Chapter 38: New Business Occupancies 38.3.4.4	**38.3.4.4 Emergency Forces Notification.** Emergency forces notification shall be provided and shall include notifying both of the following: (1) Fire department in accordance with 9.6.4 (2) Local emergency organization, if provided	
38.7.1	**38.7 Operating Features.** **38.7.1 Emergency Plans.** Emergency plans complying with Section 4.8 shall be provided in high-rise buildings.	
38.7.2	**38.7.2 Drills.** In all business occupancy buildings occupied by more than 500 persons, or by more than 100 persons above or below the street level, employees and supervisory personnel shall be periodically instructed in accordance with Section 4.7 and shall hold drills periodically where practicable.	
Chapter 39: Existing Business Occupancies 39.7.1	**39.7 Operating Features.** **39.7.1 Emergency Plans.** Emergency plans complying with Section 4.8 shall be provided in high-rise buildings.	

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39.7.2	**39.7.2 Drills.** In all business occupancy buildings occupied by more than 500 persons, or by more than 100 persons above or below the street level, employees and supervisory personnel shall be periodically instructed in accordance with Section 4.7 and shall hold drills periodically where practicable.	

NFPA 102: Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures (2011 Edition)		
Section #	**Section Text**	**Annex Text**
Chapter 1: Administration 1.2	**1.2 Purpose.** The purpose of this standard is to provide minimum requirements for life safety in relation to fire, storm, collapse, and crowd behavior in tents, membrane structures, and assembly seating as covered in Section 1.1.	

NFPA 130: Standard for Fixed Guideway Transit and Passenger Rail Systems (2014 Edition)		
Section #	**Section Text**	**Annex Text**
Chapter 4: General 4.2	**4.2 Goals.** **4.2.1*** The goals of this standard shall be to provide an environment for occupants of fixed guideway and passenger rail system elements that is safe from fire and similar emergencies to a practical extent based on the following measures: (1) Protection of occupants not intimate with the initial fire development (2) Maximizing the survivability of occupants intimate with the initial fire development	**A.4.2.1** The fire-life safety concepts in this standard are predicated and achieved by providing tenable conditions for evacuation of passengers described in this standard, as follows: (1) Fire hazard control through use of fire-hardened materials in stations, tunnels, and trains (2) Provision of fire detection, alarm notification, communication systems, and evacuation routes (3) Natural ventilation or mechanical ventilation providing smoke control to maintain tenability (4) Fire safety system reliability through system redundancy and increased safety in emergency system wires and cables that might be exposed to fire The inclusion of automatic fire suppression systems in stations, tunnels, or trains provides an active system that can limit fire growth and thereby assist in reducing risk to life and property. Where such systems are provided, variations to requirements in this standard for materials, communications, systems, or reliability can be considered where supported by engineering analysis as permitted by Section 1.4 and in accordance with good fire protection engineering practice.
5.3.1.2	**5.3.1.2** For a station, the design of the means of egress shall be based on an emergency condition requiring evacuation of the train(s) and station occupants to a point of safety.	
5.3.8.6	**5.3.8.6*** Fare barriers shall be designed so that their failure to operate properly will not prohibit movement of passengers in the direction of emergency egress.	**A.5.3.8.6** Refer to A.5.3.8.2. (**A.5.3.8.2** "Unimpeded travel in the direction of egress" means that any barriers in the equipment (such as paddles, gates, or turnstiles) either drop away to create a clear opening or swing or revolve freely in the direction of egress with no latching mechanism.)
6.1.2.1	**6.1.2 Use and Occupancy.** **6.1.2.1** Passengers shall enter the trainways only in the event that it becomes necessary to evacuate a train.	
6.1.2.2	**6.1.2.2** Evacuation shall take place only under the guidance and control of authorized, trained system employees or other authorized personnel as warranted under an emergency situation.	

NFPA 130: Standard for Fixed Guideway Transit and Passenger Rail Systems (2014 Edition)		
Section #	**Section Text**	**Annex Text**
6.3.1.1	**6.3 Emergency Egress.** **6.3.1 Location of Egress Routes.** **6.3.1.1*** The system shall incorporate a walk surface or other approved means for passengers to evacuate a train at any point along the trainway so that they can proceed to the nearest station or other point of safety.	**A.6.3.1.1** The trainway and the vehicle means of egress should be designed to be compatible. *(See Chapter 8.)*
6.3.5.1	**6.3.5 Signage, Illumination, and Emergency Lighting.** **6.3.5.1** Warning signs posted on entrances to the trainway and on fences or barriers adjacent to the trainway shall clearly state the hazard (e.g., DANGER HIGH VOLTAGE — 750 VOLTS) with letter sizes and colors in conformance with *NFPA 70* and Occupational Safety and Health Administration (OSHA) requirements.	
6.4.1.1	**6.4 Fire Protection and Life Safety Systems.** **6.4.1 Emergency Access.** **6.4.1.1** Except as described herein, points of egress and exits from the guideway shall serve as emergency access routes.	
Chapter 8: Vehicles 8.8.1	**8.8 Emergency Egress Facilities.** **8.8.1*** Each vehicle shall be provided with a minimum of two means of emergency egress located on the sides or at the end(s), installed as remotely from each other as practicable.	**A.8.8.1** Since 1980, the Federal Railroad Administration (FRA) has required that each rail passenger car be provided with at least four emergency window exits. In 1999, the FRA issued a passenger equipment rule that required each intercity and commuter rail car to be equipped with a minimum number of two side doors per car and at least four emergency window exits for each main level. Each sleeping compartment must also be provided with an emergency window exit. Because fixed guideway vehicles historically have been provided with at least two sets of bi-leaf side doors, one on each side, emergency exit windows usually are not provided.

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8.8.1.1	**8.8.1.1*** Alternative means of emergency egress, including roof hatches as necessary for the type of vehicle, shall be approved.	**A.8.8.1.1** After a collision or derailment, the vehicle might come to a rest in an orientation other than upright. When designing alternative means of emergency egress, consideration should be given to reaching the emergency egress, regardless of vehicle orientation. This can be accomplished by the utilization of fixed appurtenances in the vehicle, ladders, or ramps.
8.8.2	**8.8.2** A means to allow passengers to evacuate the vehicle safely to a walk surface or other suitable area under the supervision of authorized employees in case of an emergency shall be provided.	
8.11.6.3	**8.11.6 Maintenance of Design Features.** **8.11.6.3** Any variations made to vehicle original design features that affect life safety and fire protection shall be approved prior to the actual change being made.	
Chapter 9: Emergency Procedures 9.2.3	**9.2.3** Passengers shall be advised and informed during an emergency, to discourage panic or stress during adverse circumstances.	

9.3	**9.3 Emergencies.** The emergency management plan shall address the following types of emergencies: (1) Fire or smoke conditions within the system structures, including stations, guideways (revenue or nonrevenue), and support facilities (2) Collision or derailment involving the following: (a) Rail vehicles on the guideway (b) Rail vehicles with privately owned vehicles (c) Intrusion into the right-of-way from adjacent roads or properties (3) Loss of primary power source resulting in stalled trains, loss of illumination, and availability of emergency power (4) Evacuation of passengers from a train to all right-of-way configurations under circumstances where assistance is required (5) Passenger panic (6) Disabled, stalled, or stopped trains due to adverse personnel/passenger emergency conditions (7) Tunnel flooding from internal or external sources (8) Disruption of service due to disasters or dangerous conditions adjacent to the system, such as hazardous spills on adjacent roads or police activities or pursuits dangerously close to the operational system (9) Structural collapse or imminent collapse of the authority property or adjacent property that threatens safe operations of the system (10) Hazardous materials accidentally or intentionally released into the system (11) Serious vandalism or criminal acts, including terrorism	

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	(12) First aid or medical care for passengers on trains and in stations (13) Extreme weather conditions, such as heavy snows, high or low temperatures, sleet, or ice (14) Earthquake (15) Any other emergency as determined by the authority having jurisdiction	

NFPA 150: Standard on Fire and Life Safety in Animal Housing Facilities (2013 Edition)		
Section #	**Section Text**	**Annex Text**
Chapter 4: General Requirements 4.3.4.1	**4.3.4 Disaster/Emergency Management Program.** **4.3.4.1 General.** Disaster/emergency management programs shall be required in all animal housing facilities to protect and ensure the safety of the animal and human occupants during fire or other similar emergencies.	

NFPA 170: Standard for Fire Safety and Emergency Symbols (2012 Edition)		
Section #	**Section Text**	**Annex Text**
Chapter 1: Administration 1.1	**1.1 Scope.** This standard presents symbols used for fire safety, emergency, and associated hazards.	
1.2	**1.2 Purpose.** The purpose of this standard is to standardize the symbols used in representing fire safety, emergency, and associated hazards.	
Chapter 4: Symbols for General Use 4.1.1	**4.1 Introduction.** **4.1.1** This chapter presents general referents and symbols for fire prevention and visual alerting that shall be used for fire and related life safety emergencies.	
Chapter 5: Symbols for Use by the Fire Service 5.1.1	**5.1 Introduction.** **5.1.1*** This chapter presents standard referents and symbols that shall be used for visually alerting fire fighters and other emergency responders during fire and related emergencies.	**A.5.1.1** The purpose of this chapter is to present uniform fire-fighting symbols in order to improve communication wherever symbology is employed in order to provide information to fire fighters and other emergency responders. This chapter provides uniformity in the selection of symbols that are intended to assist fire fighters in locating utilities and fire-fighting equipment.
Chapter 9: Symbols for Use in Pre-Incident Planning Sketches 9.6	**9.6* Identification of Hazardous Materials.** NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*, shall be permitted to be used to identify the location of hazardous materials within a structure.	**A.9.6** Figure A.9.6 shows an example of hazardous identification. **FIGURE A.9.6 Example of Hazardous Identification.**

NFPA 415: Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways (2013 Edition)		
Section #	**Section Text**	**Annex Text**
none		

NFPA 424: Guide for Airport/Community Emergency Planning (2013 Edition)		
Section #	**Section Text**	**Annex Text**
Chapter 4: Elements of Emergency Planning 4.2.1	**4.2 Types of Emergencies and Emergency Alerts.** *(See Annex D.)* **4.2.1** Many different types of emergencies can strike a community. However, when creating the AEP, the focus should be on aircraft-related incidents. Preparation, including risk assessment for other types of emergencies, should be addressed in the pre-emergency planning documents built around the special nature of those incidents.	
Chapter 5: Agencies Involved 5.3.5	**5.3 ARFF Services (Departments).** **5.3.5** As part of the interagency planning process, health and safety risks associated with an aircraft accident/incident should be communicated to other agencies that could become involved. The IC of the ARFF response should ensure that other agencies working within the immediate crash site are aware of the potential hazards and the appropriate personnel protective clothing/equipment that could be required.	
5.4.2	**5.4 Police/Security Services.** **5.4.2*** Congestion-free ingress and egress roads should be established immediately for emergency vehicles. The security services, police force, or other appropriate local authorities should be expected to ensure that only persons with specific tasks are allowed at the scene of the accident, and they also should be expected to route the normal traffic away from or around the accident site.	**A.5.4.2** The first security officer to arrive should assume security responsibility, survey the scene, and request reinforcements as needed. This security officer should remain in command until relieved by the appropriate security authority with jurisdiction over the area. The security chief should be highly visible. Typically, a blue industrial hard hat with reflective lettering displayed fore and aft and imprinted with "SECURITY CHIEF" should be issued to the security incident commander. Security personnel and police will be needed to handle traffic, to keep unauthorized personnel from the crash site, and to assume custody of personal effects removed from the aircraft. Ingress and egress roads should be established as congestion-free traffic lanes for emergency vehicles. Normal traffic should be routed away from and around the crash site. The emergency site should be cordoned off as soon as possible to exclude intruders, sightseers, onlookers, and souvenir hunters. Appropriate markings should be prominently displayed to advise all persons of possible hazards that can cause serious injury should they encroach

NFPA 424: Guide for Airport/Community Emergency Planning (2013 Edition)		
Section #	**Section Text**	**Annex Text**
		on the area. Armbands, site passes, or ID tags should be issued by the controlling authority and monitored by the security coordinator and his or her team. A mutual aid program should be instituted between all potentially involved security agencies, for example, airport, city, county, state, and federal security forces; mail inspectors; and, where appropriate, military police and customs officials. Special security provisions are necessary to protect any mail involved and any dangerous goods that can be present, and to protect against radioactive materials exposure.

NFPA 502: Standard for Road Tunnels, Bridges, and Other Limited Access Highways (2014 Edition)		
Section #	**Section Text**	**Annex Text**
Chapter 4: General Requirements 4.3.2	**4.3.2* Fire Protection, Life Safety, and Emergency Systems Reliability.** Regardless of the length or type of facility, the intended function of the fire protection, life safety, or emergency systems that address an emergency shall not be subject to failure as a result of the emergency that those systems are designed to address when working in combination.	**A.4.3.2** Fire protection, life safety, or emergency systems are comprised of interdependent mechanical, electrical, communications, control, fire protection, structural, architectural, and other elements, all of which must function as a system to achieve the designed result. It is critical that all primary and supporting elements are protected to produce a similar level of combined system reliability for the design incident exposure. This does not preclude loss of elements that are compensated for in the design.
4.7	**4.7* Commissioning and Integrated Testing.**	**A.4.7** The commissioning and integrated testing plans should be prepared in accordance with NFPA 3.
4.7.1	**4.7.1** The agency shall require the development of a commissioning plan to facilitate the verification of the operational readiness of all installed fire protection, life safety, and emergency systems required by this standard, other applicable NFPA standards, and as required within the basis of design (BOD) for construction.	
4.7.3	**4.7.3** The commissioning plan shall document the procedures to be used for the testing of the specific individual fire protection, life safety, and emergency systems, including procedures and requirements to verify operational readiness of integrated and/or interconnected fire protection, life safety, and emergency systems.	

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Section #	**Section Text**	**Annex Text**
Chapter 13: Emergency Response 13.2	**13.2* Emergencies.** The following typical incidents shall be considered during the development of facility emergency response plans: (1) Fire or a smoke condition in one or more vehicles or in the facility (2) Fire or a smoke condition adjoining or adjacent to the facility (3) Collision involving one or more vehicles (4) Loss of electric power that results in loss of illumination, ventilation, or other life safety systems (5) Rescue and evacuation of motorists under adverse conditions (6) Disabled vehicles (7) Flooding of a travel way or an evacuation route (8) Seepage and spillage of flammable, toxic, or irritating vapors and gases (9) Multiple casualty incidents (10) Damage to structures from impact and heat exposure (11) Serious vandalism or other criminal acts, such as bomb threats and terrorism (12) First aid or medical attention for motorists (13) Extreme weather conditions, such as heavy snow, rain, high winds, high heat, low temperatures, or sleet and ice, that cause disruption of operation (14) Earthquake (15) Hazardous materials accidentally or intentionally being released into the tunnel	**A.13.2** The complexity of the interface between the operating authorities and the emergency responders should not be underestimated. The knowledge of safety related to a specific tunnel and the responses in case of an accident will differ, depending on the tunnel operator, the emergency services, and the users. Emergency response plans aim to ensure that tunnel users and fire and rescue services are exposed to the least risk. The tunnel operator understands the features available and should take appropriate action to implement procedures that will minimize the danger to occupants. The operator will call in the emergency services and generally follow a prescribed plan. The development of this plan and how it should be refined through exercises and training should also be addressed. The emergency services need knowledge of the tunnel details, technical systems, and operational possibilities to take control of the situation and begin the rescue operation with maximum safety, with a need to interpret possibly incomplete information in situations that can change rapidly, and to deal with human behavioral problems. More detail can be found in Fire in Tunnels Thematic Network, Technical Report 3: “Fire Response Management,” 2004.
Chapter 15: Periodic Testing 15.1	**15.1* Periodic Testing.**	**A.15.1** Periodic testing and mandatory testing after a major fire incident within the facility should be performed in accordance with NFPA 3.

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Section #	**Section Text**	**Annex Text**
15.1.1	**15.1.1** Fire protection, life safety, emergency ventilation, communication, traffic control, and electrical systems shall be inspected and tested for operational readiness and performance in accordance with the frequency requirements of the applicable NFPA standards or in accordance with 15.1.2.	
15.1.2	**15.1.2** Integrated and/or interconnected fire protection, life safety, and emergency systems shall be inspected and tested for operational readiness and performance in accordance with the frequency requirements established by the basis of design or intervals not to exceed five years.	

NFPA 520: Standard on Subterranean Spaces (2010 Edition)		
Section #	**Section Text**	**Annex Text**
none		

NFPA 610: Guide for Emergency and Safety Operations at Motorsports Venues (2009 Edition)		
Section #	**Section Text**	**Annex Text**
Chapter 4: Incident Action Plan 4.7.2.1	**4.7.2 Traffic Control Component.** **4.7.2.1** The traffic control component should include plans for inbound and outbound flow of emergency vehicles and provisions for emergency evacuation of all or part of the site.	
4.7.2.2	**4.7.2.2** The traffic control component should include the identification and method of contact for agencies or persons, or both agencies and persons, responsible for traffic flow management and emergency traffic scenarios.	
4.9.1	**4.9 Critical Incident Stress Debriefing (CISD).** **4.9.1** A process for identifying incidents in which critical incident stress is a significant hazard should be established and should include identifying personnel adversely affected by incident stress and promptly initiating critical incident stress debriefing (CISD).	
Chapter 5: Training 5.2.2	**5.2 Motorsports Safety Awareness Level.** **5.2.2** It is not the intent of this guide to expect someone informed at the awareness level to take an aggressive role in reducing the severity of the incident. However, there might be actions the person could take as they move to a safe area, such as closing a door, shutting off a fuel valve on a burner, shutting off a power switch, or directing people away from the incident area, as these actions could reduce the severity of the incident without jeopardizing their own safety.	

NFPA 610: Guide for Emergency and Safety Operations at Motorsports Venues (2009 Edition)		
Section #	**Section Text**	**Annex Text**
Chapter 7: Equipment 7.1	**7.1 General.** The goal of emergency services personnel at any motorsports venue/event is to respond to an emergency situation with minimal time delays and with the necessary equipment to handle the incident and to protect persons from further injury.	

NFPA 909: Code for the Protection of Cultural Resource Properties (2013 Edition)		
Section #	**Section Text**	**Annex Text**
none		

NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs (2013 Edition)		
Section #	**Section Text**	**Annex Text**
Chapter 5: Planning 5.2	**5.2* Risk Assessment.**	**A.5.2** Risk assessment is a process for identifying potential hazards/risk exposures and their relative probability of occurrence; identifying assets at risk; assessing the vulnerability of the assets exposed; and quantifying the potential impacts of the hazard/risk exposures on the assets. Periodic reassessment is needed when changes to the entity occur. Reassessment is also necessary because hazards/risk exposures change over time, and the collective knowledge of hazards/risk exposures develops over time. In addition to identifying hazards that could be the primary cause of an incident, consideration should also be given to those secondary hazards or cascading events that could cause additional impact to the entity and its assets. As an example, a fire could result in injury or death, property damage, interruption of operations, contamination of the environment, and negative attention on the entity. A comprehensive risk assessment identifies the range of hazard/risk exposures, including threats, hazards, or disruptive incidents, that have impacted or might impact the entity, the surrounding area, or the critical infrastructure supporting the entity. The potential impact of each threat, hazard/risk exposure, or disruptive incident is determined by the capabilities of the perpetrator, the magnitude of the hazard, and the scope of the incident, as well as the vulnerability of people, property, technology, the environment, and the entity's operations to the threat, hazard, or incident and the adequacy of existing mitigation. There are multiple methods to perform a risk assessment, but the entity should adhere to the following steps for conducting a comprehensive risk assessment: (1) Determine the methodology the entity will use to conduct the assessment and determine whether the entity has the necessary expertise to perform the assessment. (2) Consult with internal or external experts with the expertise to assess the vulnerability of the entity's assets from identified hazards. (3) Identify and categorize assets (human resources, buildings, equipment, operations, technology, electronic information, suppliers, vendors, third-party service providers, etc.). (4) Identify threats and hazards — natural, human caused (accidental and intentional), and technology caused. (5) Evaluate hazard/risk exposures to which the entity is exposed. (6) Assess the existing/current preventive measures and mitigation controls in place against credible threats. (7) Categorize threats, hazard/risk exposures, and potential incidents by their relative frequency and

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		severity. Keep in mind that there might be many possible combinations of frequency and severity for each, as well as cascading impacts. (8) Evaluate the residual hazard/risk exposures (those that remain hazardous after prevention and mitigation activities). Information from the risk assessment and impact analysis will help determine priorities for prevention and mitigation activities as well as prioritize development of plans and procedures. The entity should attempt to prevent, mitigate, prepare for, plan to respond to, and plan to recover from incidents that have significant potential to impact people; property; operational capabilities, including technology; the environment; and the entity itself.
5.2.2.1	**5.2.2.1*** Hazards to be evaluated shall include the following: (1) Natural hazards (geologic, meteorologic, and biological) (2) Human-caused events (accidental and intentional) (3) Technology-caused events (accidental and intentional)	**A.5.2.2.1** The following is an expanded list of hazards that should be considered during the risk assessment. Many hazards can be classified in multiple categories. A wildland fire might be caused by lightning or an intentional act. A fire in a chemical plant could be caused by human error or the failure of technology, such as a malfunctioning or improperly programmed control system. Hazards that should be considered during the risk assessment include natural hazards/risk exposures (geologic, meteorologic, and biological), human-caused events (accidental and intentional), and technology-caused incidents: (1) Geologic hazards/risk exposures (a) Earthquake (b) Tsunami (c) Volcano (d) Landslide, mudslide, subsidence (2) Meteorologic hazards/risk exposures (a) Flood, flash flood, seiche, tidal surge (b) Water control structure (e.g., dam, levee) failure (c) Drought (d) Snow, ice, hail, sleet, avalanche, arctic freeze (e) Windstorm, tropical cyclone, hurricane, tornado, water spout, dust storm, sandstorm (f) Extreme temperatures (heat, cold) (g) Wildland fire (h) Lightning strikes (i) Famine (j) Geomagnetic storm (3) Biological hazards/risk exposures (a) Food-borne illnesses (b) Pandemic disease (e.g., avian flu, H1N1) (c) Infectious/communicable disease [e.g., plague, smallpox, anthrax, West Nile virus, foot and mouth disease, severe acute respiratory syndrome (SARS), bovine spongiform encephalopathy (BSE, or Mad Cow Disease)] (4) Accidental human-caused events

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		(a) Hazardous material spill or release (flammable liquid; flammable gas; flammable solid; oxidizer; poison; explosive, radiological, or corrosive material) (b) Nuclear power plant incident, radiological incident (c) Explosion/fire (d) Transportation accident (e) Building/structure collapse (f) Entrapment and/or rescue (machinery, confined space, high angle, water) (g) Fuel/resource shortage (h) Mechanical breakdown (i) Transportation incidents (motor vehicle, railroad, watercraft, aircraft, pipeline) (j) Untimely death of employee (5) Intentional human-caused events (a) Strike or labor dispute (b) Criminal activity (vandalism, sabotage, arson, robbery, theft, fraud, embezzlement, data theft, malfeasance) (c) Physical or information security breach (d) Lost person, child abduction, kidnapping, extortion, hostage incident, workplace/school/university violence, homicide (e) Product defect or contamination (f) Disinformation (g) Harassment (h) Discrimination (i) Demonstrations, civil disturbance, public unrest, mass hysteria, riot (j) Bomb threat, suspicious package (k) Terrorism (explosive, chemical, biological, radiological, nuclear, cyber, electromagnetic pulse) (l) Insurrection (m) Enemy attack, war (n) Arson (6) Technology-caused incidents (a) Computer systems [outages, hardware failure, data corruption, deletion, theft, loss of network connectivity (Internet or intranet), loss of electronic data interchange or ecommerce, loss of domain name server (DNS), virus, worm, Trojan horse, power surge, lightning, host site interdependencies, direct physical loss, water damage, cyber terrorism, vulnerability exploitation, botnets, hacking, phishing, spyware, malware, computer fraud, loss of encryption, denial of service, improper system use by employee, telecommunications interruption or failure, electricity brownout or blackout] (b) Computer software or application interruption, disruption, or failure (internal/external) (c) Loss, corruption, or theft of electronic information (d) Utility interruption or failure (telecommunications,

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		electrical power, water, gas, steam, HVAC, pollution control system, sewage system, other critical infrastructure)
5.2.3	**5.2.3** The entity shall conduct an analysis of the impacts of the hazards identified in 5.2.2 on the following: (1) Health and safety of persons in the affected area (2) Health and safety of personnel responding to the incident (3)*Continuity of operations (4)*Property, facilities, assets, and critical infrastructure (5) Delivery of the entity's services (6) Supply chain (7) Environment (8)*Economic and financial conditions (9) Regulatory and contractual obligations (10) Reputation of or confidence in the entity	
5.4.1	**5.4 Resource Needs Assessment.** **5.4.1*** The entity shall conduct a resource needs assessment based on the hazards identified in Section 5.2 and the business impact analysis in Section 5.3.	**A.5.4.1** The entity should identify the resources necessary to support the program, plan for and procure needed resources, effectively manage resources that have been acquired to support operational needs, and establish mutual aid/partnership agreements as necessary. Resources should be available within the required time frame as required for emergency operations/response and to meet recovery time objectives. Resources should have the capability to perform their intended function. Scenarios developed during the risk assessment and business impact analysis should be used to identify resources needed by the program. Resources for emergency operations/response to protect life safety, stabilize the incident, and protect property should be identified. Resources required to execute recovery strategies within the recovery time objective also should be identified. The resource needs assessment should identify resource requirements necessary to achieve performance objectives.
5.4.2	**5.4.2** The resource needs assessment shall include the following: (1)*Human resources, equipment, training, facilities, funding, expert knowledge, materials, technology, information, intelligence, and	**A.5.4.2(1)** The resource needs assessment might include "credentialing," which addresses the need for individuals licensed (e.g., doctors, engineers) in one jurisdiction (state or country) performing their professional duties (as volunteers or under mutual aid compacts) during an incident in a jurisdiction where they are not licensed or do not hold the proper credentials. Credentialing provides minimum professional qualifications, certifications,

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	the time frames within which they will be needed (2) Quantity, response time, capability, limitations, cost, and liabilities	training, and education requirements that define the standards required for specific emergency response functional assignments.
5.4.3	**5.4.3*** The entity shall establish procedures to locate, acquire, store, distribute, maintain, test, and account for services, human resources, equipment, and materials procured or donated to support the program.	**A.5.4.3** All program equipment should be checked and tested on a regularly scheduled basis to ensure it will function properly when required. This might include vehicles, personal protective equipment (PPE), radio, information technology equipment, and warning and alerting devices and equipment, including sirens, special emergency response equipment, and so forth. Resources can be prepositioned to expedite deployment. These resources can include the following: (1) Locations, quantities, accessibility, operability, and maintenance of equipment (2) Supplies (medical, personal hygiene, consumable, administrative, ice) (3) Sources of energy (electrical, fuel) (4) Emergency power (5) Communications systems (6) Food and water (7) Technical information (8) Clothing (9) Shelter (10) Specialized human resources (medical, faith-based, and volunteer organizations; emergency management staff; utility workers; morticians; and private contractors) (11) Employee and family assistance
Chapter 6: Implementation 6.1.1	**6.1 Common Plan Requirements.** **6.1.1*** Plans shall address the health and safety of personnel.	**A.6.1.1** The safety and health of personnel are critical to the successful execution of the program. When every person accepts and performs as if safety and health are their personal responsibility, hazardous exposures will be minimized and the probability of accidents and incidents will be reduced. Hazard/risk exposure can be eliminated or minimized by removing the hazards or by not performing the hazardous task. However, complete elimination of risk is not always be feasible, and controls should then be instituted. Hazard control begins with identification of the hazard and the vulnerability of people or assets potentially exposed and elimination or mitigation according to the hierarchy of controls as follows: (1) *Elimination or substitution*. Whenever possible, the hazard should be eliminated from the work area (e.g., repairing or removing fallen electrical power lines before allowing other work to proceed in the area). Although desirable, elimination or substitution might not be options for most airborne/chemical hazards created by an incident. (2) *Engineering controls*. Steps should be taken to reduce or eliminate exposure to a hazard through engineering

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		controls such as the installation of ventilation systems, automatic sprinklers (building), or special protection systems. (3) *Administrative controls*. Work practices should be implemented that reduce the duration, frequency, and severity of risk exposures. Safety and health controls include training, safety procedures, observations, and enforcement of safe behavior, for example, using well-rested crews and daylight hours to perform higher hazard or unfamiliar tasks, requiring frequent breaks during hot weather, removing nonessential personnel from the area during certain tasks/operations, and decontaminating equipment and personnel after contact with contaminated floodwater or chemicals, and when possible, using water to suppress dust and work upwind in dusty conditions. (4) *Personal protective equipment (PPE)*. If hazard exposures cannot be engineered or administratively controlled, individuals should be shielded or isolated from chemical, physical, and biological hazards through the use of PPE. Careful selection and use of adequate PPE should protect the respiratory system, skin, eyes, face, hands, feet, head, body, and hearing. Examples of PPE are safety glasses and goggles for eyes, gloves for hands, and respirators to protect the lungs. Control of the hazard exposures should not stop with providing PPE. Incident management systems (IMSs) have trained, designated incident safety officers, but hazard exposure control should be a paramount concern of every person involved. Recovery operations can be particularly hazardous. Due to the nature of the recovery, normal operations might be disrupted and the hazards uncontrolled. For example, work conditions change drastically after hurricanes and other natural disasters. In the wake of a hurricane, response and recovery workers face additional challenges, such as downed power lines, downed trees, and high volumes of construction debris, while performing an otherwise familiar task or operation. Procedures and training are needed to help ensure safe performance of those engaged in cleanup after an incident. Corrective actions to eliminate or mitigate hazard exposure should be aggressive and complete, but they also should be carefully considered before implementation so as not to create a new set of hazard exposures.
6.2.1	**6.2 Prevention.** **6.2.1*** The entity shall develop a strategy to prevent an incident that threatens life, property, and the environment.	**A.6.2.1** Common prevention and deterrence strategies include the following: (1) Security patrols inside and outside facilities; increased inspections of vehicles entering the facility; background checks of personnel (2) Access controls, including perimeter fence line and gates, access control systems, camera surveillance,

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		intruder detection systems (motion-sensing cameras, infrared detectors) (3) Immunizations, isolation, or quarantine (4) Land use restrictions to prevent development in hazard prone areas, such as flooding areas or construction of hazardous materials facilities in areas near schools, in population centers, or in areas of identified critical infrastructure (5) Uninterruptible power supply (UPS) to provide short term backup power to critical electrical components, including the data center power distribution unit (PDU), desktop computers in time-sensitive operational areas, phone switchboard (PBX), the HVAC system, and safety controls such as elevators and emergency lighting (6) Gasoline- or diesel-powered generators to provide long term backup power (7) Crime prevention through environmental design (CPTED), including site layout, landscape design, and exterior lighting (8) Personnel management (9) Background investigations (10) Cyber security, including firewalls, intrusion detection, virus protection, password management, cryptographic key management, and access to information based on need to know
6.2.3	**6.2.3** The prevention strategy shall be based on the results of hazard identification and risk assessment, an analysis of impacts, program constraints, operational experience, and a cost-benefit analysis.	
6.2.4	**6.2.4** The entity shall have a process to monitor the identified hazards and adjust the level of preventive measures to be commensurate with the risk.	
6.8.1	**6.8 Emergency Operations/Response Plan.** **6.8.1*** Emergency operations/response plans shall define responsibilities for carrying out specific actions in an emergency.	
6.8.2	**6.8.2*** The plan shall identify actions to be taken to protect people, including those with access and functional needs, property, operations, the environment, and the entity.	

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6.8.4	**6.8.4** The plan shall include the following: (1) Protective actions for life safety in accordance with 6.8.2. (2) Warning, notifications, and communication in accordance with Section 6.5. (3) Crisis communication and public information in accordance with Section 6.4 (4) Resource management in accordance with 6.7.7 (5) Donation management in accordance with 6.7.9	

NFPA 1620: Standard for Pre-Incident Planning (2010 Edition)		
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Chapter 6: Occupant Considerations 6.2.1.1	**6.2 Life Safety Considerations.** **6.2.1 General.** **6.2.1.1** Life safety considerations shall be addressed to allow emergency responders to assist in the evacuation of a facility or to support defend-in-place/remain-in-place strategies.	
Chapter 8: Special Hazards 8.1	**8.1* General.** The pre-incident plan shall identify and document any special hazards recognized by the authority having jurisdiction that present extraordinary life safety challenges, operations challenges, or other challenges to emergency responders.	**A.8.1** Pre-incident planning for facilities where hazardous materials are present should record the following: (1) Impact on emergency operations (2) Specific hazard(s) of the materials (3) Quantity and type of materials present and container type(s) (4) Engineering controls (5) Containment systems (6) Fire suppression systems (7) Special fire-fighting requirements
8.4.2	**8.4.2 Hazardous Materials.** Where the storage or use of hazardous materials has been identified as a special hazard, the pre-incident plan shall include the specifications of 8.4.2.1 through 8.4.2.5.2.	
8.4.2.3	**8.4.2.3* Toxic or Biological Agents.**	**A.8.4.2.3** Special notation should be made of the special protective equipment that might be needed, location and identity of the agents, special security features and procedures, entry precautions and procedures, and special containment features, including locked storage, *in vivo* or *in vitro* use.
8.4.2.4	**8.4.2.4* Radioactive Materials.**	**A.8.4.2.4** Small radioactive sources used in laboratory, manufacturing, health care, or other occupancies could pose significant risks if removed from their storage or shielding. Information should be included about special entry requirements or security procedures and alarms for equipment such as lasers, irradiators, or other areas or devices that could result in exposure to responders.
8.4.2.5	**8.4.2.5* Reactive Chemicals and Materials.**	**A.8.4.2.5** Many chemicals can produce an adverse reaction if contaminated or mixed with other materials chemicals could also undergo a chemical reaction when exposed to elevated temperatures as in a fire and have the potential for buildup of pressure in containers and the generation of toxic byproducts and heat. Reactive chemicals that require cooling, for example, in a refrigerated warehouse, should also be noted, because it is likely that power could be interrupted during an emergency. Plan for any chemical processes that could become hazardous if interrupted or left unattended (e.g.,

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		during the building evacuation). Materials that react upon exposure to air or water should also be documented on the pre-incident plan. Include information about any secondary containment to prevent exposure to hazardous conditions.
8.4.3	**8.4.3* Special Atmospheres.** Any area of an occupancy that contains rooms or equipment storing or using special gases or vapors that can present a hazard to the emergency responders shall be identified in the pre-incident plan.	**A.8.4.3** Examples of places that might contain hazardous atmospheres include the following: (1) Confined spaces (2) Inert atmospheres (3) Ripening facilities (4) Special equipment treating atmospheres (5) Fumigation chambers or active fumigation operation (6) Magnetic resonance imaging (MRI) quench gases

1.1.5* Hazardous Materials Emergencies.
The *Code* also addresses other considerations that provide for occupant protection during emergency events involving hazardous materials.

Renumber existing 1.1.5, 1.1.6, A.1.1.5 and A.1.1.6(1).

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A.1.1.5 Incidents involving hazardous materials are capable of posing significant life safety challenges in buildings. The *Code* recognizes this potential and includes technical requirements to address concerns related to hazardous material inventories and associated emergencies.

____ ____ ____

4.1.3* Hazardous Materials Emergencies.
An additional goal is to provide reasonable life safety during emergency events involving hazardous materials regulated by NFPA 30, NFPA 45, NFPA 54, NFPA 55, NFPA 58, NFPA 400, and NFPA 495.

Renumber existing 4.1.3 and A.4.1.3.

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A.4.1.3 See Annex C – NFPA Documents on Hazardous Materials.

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4.2.3* Hazardous Materials Emergencies Protection.
Fundamental safeguards shall be provided to reasonably prevent or mitigate events involving hazardous materials as addressed in 4.1.3 to allow the time needed to evacuate, relocate, or defend in place occupants who are not intimate with the initial emergency incident.

Renumber existing 4.2.3.

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A.4.2.3 See 4.1.3 and Annex C for referenced documents on hazardous materials.

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6.2.2 Classification of Hazard of Contents.
A.6.2.2.1 These classifications do not apply to the application of sprinkler protection classifications. See NFPA 13. Depending on the use of the space, the area might require special hazard protection in accordance with Section 8.7.

Also, these classifications do not apply to the application of hazardous materials classifications within NFPA 400. NFPA 101 primarily classifies hazards based on fire severity. NFPA 400 regulates contents through a different classification system, which takes into consideration physical hazards, health hazards, quantities, storage conditions, and use conditions.

See 4.1.3 and Annex C for referenced documents on hazardous materials.

____ ____ ____

7.12* Special Provisions for Hazardous Materials.

7.12.1 Hazardous materials that are used or stored, and that are also classified as high-hazard contents in accordance with 6.2.2, shall comply with Section 7.11 of this *Code*.

7.12.2 Where required by the provisions of Chapter 11 through Chapter 43, occupancies with hazardous materials shall comply with both of the following:
(1) Means of egress requirements of this *Code*
(2) Applicable means of egress requirements of NFPA 30, NFPA 45, NFPA 55, NFPA 58, NFPA 400, and NFPA 495 that are stricter than the means of egress requirements of this *Code*.

Renumber Section 7.12, 7.13 and 7.14.

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A.7.12 See 4.1.3 and Annex C for referenced documents on hazardous materials.

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~~**8.7.3 Flammable Liquids and Gases.**~~

~~**8.7.3.1** The storage and handling of flammable liquids or gases shall be in accordance with the following applicable standards:~~

~~(1) NFPA 30, *Flammable and Combustible Liquids Code*~~
~~(2) NFPA 54, *National Fuel Gas Code*~~
~~(3) NFPA 58, *Liquefied Petroleum Gas Code*~~

8.7.3* Hazardous Materials.

8.7.3.1 Where required by the provisions of Chapter 11 through Chapter 43, occupancies with storage and handling of hazardous materials shall comply with the following codes unless otherwise modified by other provisions of this *Code*: NFPA 30, NFPA 54, NFPA 55, NFPA 58, NFPA 400, and NFPA 495.

____ ____ ____

8.7.3.2* No storage, use or handling of ~~flammable liquids or gases~~ hazardous materials shall be permitted in any location where such storage, use or handling would ~~alter the occupancy classification or~~ jeopardize egress from the structure, unless otherwise permitted by a document listed in ~~by~~ 8.7.3.1.

___ ___ ___

A.8.7.3.2 NFPA 58 permits portable butane-fueled appliances in restaurants and in attended commercial food catering operations where fueled by not in excess of two 10 oz (0.28 kg) LP-Gas capacity, nonrefillable butane containers having a water capacity not in excess of 1.08 lb (0.4 kg) per container. Containers are required to be directly connected to the appliance, and manifolding of containers is not permitted. Storage of cylinders is also limited to 24 containers, with an additional 24 permitted where protected by a 2-hour fire resistance–rated barrier.

See 4.1.3 and Annex C for referenced documents on hazardous materials.

___ ___ ___

Annex C NFPA Documents on Hazardous Materials

This annex is not a part of the requirements of the NFPA document but is included for informational purposes only.

NFPA 30, NFPA 45, NFPA 54, NFPA 55, NFPA 58, NFPA 400, and NFPA 495 represent a comprehensive set of requirements for protection against hazardous material emergencies appropriate to the level of safety afforded by the *Life Safety Code*.

Where a conflict exists between applicable requirements, an analysis should be made and the proper applicable requirement should be implemented or conformed to subject to the approval of the AHJ. [**400**: A.4.4]

The safe handling, collection, and disposal of hazardous waste can be accomplished only if the physical, chemical, and hazardous properties of its components are known and that information is properly applied. [**400:** A.4.5 (part)]

NFPA 30, 45, 55, and 400 include maximum allowable quantities (MAQs) and the control area concept, and limits the MAQs within each control area. An established set of requirements apply to control areas with less than the MAQs. Control areas with hazardous materials quantities above the MAQs require additional controls or ~~a change in occupancy classification which will require~~ commensurate safeguards and features. NFPA 45 uses the term laboratory unit which correlates to and is similar to control areas. From NFPA 400, "The purpose is to permit limited amounts of hazardous contents in occupancies having minimum controls without triggering the more restrictive Protection Level 1 through Protection Level 4 building requirements." [400: A5.1 (part)]

The following scope and exclusions are provided from NFPA 30, NFPA 45, NFPA 54, NFPA 55, NFPA 58, NFPA 400, and NFPA 495 to clarify the applicability of each code. Refer to individual documents for additional definitions, and requirements.

NFPA 30 Section 1.1.1 states: *This code shall apply to the storage, handling, and use of flammable and combustible liquids, including waste liquids.* [**30**: 1.1.1]

NFPA 30 Section 1.1.2 states: *This code shall not apply to the following:*
*(1)*Any liquid that has a melting point of 100°F (37.8°C) or greater*
*(2)*Any liquid that does not meet the criteria for fluidity given in the definition of liquid in [NFPA 30] Chapter 3 and in the provisions of [NFPA 30] Chapter 4*
(3) Any cryogenic fluid or liquefied gas, as defined in Chapter 3
*(4)*Any liquid that does not have a flash point, but which is capable of burning under certain conditions*
*(5)*Any aerosol product*
(6) Any mist, spray, or foam
*(7)*Transportation of flammable and combustible liquids as governed by the U.S. Department of Transportation*
*(8)*Storage, handling, and use of fuel oil tanks and containers connected with oil-burning equipment*
*(9)*Use and installation of alcohol-based hand rub (ABHR) dispensers*
[**30**: 1.1.2 (modified)]

NFPA 45 Section 1.1.1 states: *This code shall apply to laboratory buildings, laboratory units, and laboratory work areas whether located above or below grade in which chemicals, as defined, are handled or stored.* [**45**: 1.1.1]

NFPA 45 Section 1.1.2 states: *This code shall not apply to the following:*
*(1)*Laboratories for which the following conditions apply:*
(a) Laboratory units that contain less than or equal to 4 L (1 gal) of flammable or combustible liquid
(b) Laboratory units that contain less than 2.2 standard m3 (75 scf) of flammable gas, not including piped-in low-pressure utility gas installed in accordance with NFPA 54, National Fuel Gas Code
*(2)*Laboratories that are pilot plants*
(3) Laboratories that handle only chemicals with a hazard rating of 0 or 1, as defined by NFPA 704, Standard System for the Identification of the Hazards of Materials for Emergency Response, for all of the following: health, flammability, and instability
(4) Laboratories that are primarily manufacturing plants
(5) Incidental testing facilities
(6) Physical, electronic, instrument, laser, or similar laboratories that use chemicals only for incidental purposes, such as cleaning
*(7)*Hazards associated with radioactive materials, as covered by NFPA 801, Standard for Fire Protection for Facilities Handling Radioactive Materials*
(8) Laboratories that work only with explosive material, as covered by NFPA 495, Explosive Materials Code
[45: 1.1.2]

NFPA 54 Section 1.1.1.1 states: *This code is a safety code that shall apply to the installation of fuel gas piping systems, appliances, equipment, and related accessories as shown in* [NFPA 54] *1.1.1.1(A) through 1.1.1.1(D).*
(A) Coverage of piping systems shall extend from the point of delivery to the appliance connections. For other than undiluted liquefied petroleum gas (LP-Gas) systems, the point of delivery shall be the outlet of the service meter assembly or the outlet of the service regulator or service shutoff valve where no meter is provided. For undiluted LP-Gas systems, the point of delivery shall be considered to be the outlet of the final pressure regulator, exclusive of line gas regulators where no meter is installed. Where a meter is installed, the point of delivery shall be the outlet of the meter.*
(B) The maximum operating pressure shall be 125 psi (862 kPa).
Exception No. 1: Piping systems for gas–air mixtures within the flammable range are limited to a maximum pressure of 10 psi (69 kPa).
Exception No. 2: LP-Gas piping systems are limited to 20 psi (140 kPa), except as provided in 5.5.1(6).
(C) Requirements for piping systems shall include design, materials, components, fabrication, assembly, installation, testing, inspection, operation, and maintenance.
(D) Requirements for appliances, equipment, and related accessories shall include installation, combustion, and ventilation air and venting.
[**54**: 1.1.1]

NFPA 55 Section 1.1.2 states: *This code shall not apply to the following items (reference standards for some of which appear in Annex L):*
(1) Portable LP-Gas appliances and equipment of all types that are not connected to a fixed fuel piping system
(2) Installation of appliances such as brooders, dehydrators, dryers, and irrigation equipment used for agricultural purposes
(3) Raw material (feedstock) applications except for piping to special atmosphere generators
(4) Oxygen–fuel gas cutting and welding systems
(5) Industrial gas applications using such gases as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen
(6) Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants
(7) Large integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by chemical reactions or used in chemical reactions
(8) LP-Gas installations at utility gas plants
(9) Liquefied natural gas (LNG) installations
(10) Fuel gas piping in electric utility power plants
(11) Proprietary items of equipment, apparatus, or instruments such as gas generating sets, compressors, and calorimeters
(12) LP-Gas equipment for vaporization, gas mixing, and gas manufacturing
(13) LP-Gas piping for buildings under construction or renovations that is not to become part of the permanent building piping system—that is, temporary fixed piping for building heat
(14) Installation of LP-Gas systems for railroad switch heating
(15) Installation of LP-Gas and compressed natural gas (CNG) systems on vehicles

(16) Gas piping, meters, gas pressure regulators, and other appurtenances used by the serving gas supplier in distribution of gas, other than undiluted LP-Gas
(17) Building design and construction, except as specified herein
(18) Fuel gas systems on recreational vehicles manufactured in accordance with NFPA1192, Standard on Recreational Vehicles
(19) Fuel gas systems using hydrogen as a fuel
(20) Construction of appliances
[**54**: 1.1.1.2]

NFPA 58 Section 1.1 states: *This code shall apply to the storage, handling, transportation, and use of liquefied petroleum gas (LP-Gas).* [**58**: 1.1]

NFPA 58 Section 1.3.2 states: *This code shall not apply to the following:*
(1) Frozen ground containers and underground storage in caverns, including associated piping and appurtenances used for the storage of LP-Gas
(2) Natural gas processing plants, refineries, and petrochemical plants
(3) LP-Gas at utility gas plants (including refrigerated storage) (see NFPA 59, Utility LP-Gas Plant Code)
*(4)*Chemical plants where specific approval of construction and installation plans is obtained from the authority having jurisdiction*
*(5)*LP-Gas used with oxygen*
*(6)*The portions of LP-Gas systems covered by NFPA 54 (ANSI Z223.1), National Fuel Gas Code, where NFPA 54 (ANSI Z223.1) is adopted, used, or enforced*
(7) Transportation by air (including use in hot air balloons),rail, or water under the jurisdiction of the DOT
*(8)*Marine fire protection*
(9) Refrigeration cycle equipment and LP-Gas used as a refrigerant in a closed cycle
(10) The manufacturing requirements for recreational vehicle LP-Gas systems that are addressed by NFPA 1192, Standard on Recreational Vehicles
(11) Propane vehicle fuel dispensers located at multiple fuel refueling stations (see NFPA 30A, Code for Motor Fuel Dispensing Facilities and Repair Garages)

NFPA 400 Section 1.1.2 states: *This code shall apply to the storage, use, and handling of the following hazardous materials in all occupancies and facilities:*
(1) Ammonium nitrate solids and liquids
(2) Corrosive solids and liquids
(3) Flammable solids
(4) Organic peroxide formulations
(5) Oxidizer — solids and liquids
(6) Pyrophoric solids and liquids
(7) Toxic and highly toxic solids and liquids
(8) Unstable (reactive) solids and liquids
(9) Water-reactive solids and liquids
*(10)*Compressed gases and cryogenic fluids as included within the context of NFPA 55, Compressed Gases and Cryogenic Fluids Code*
[**400**: 1.1.1]

NFPA 400 Section 1.1.2.1 states*: The quantity and arrangement limits in this code shall not apply to facilities that use ammonium perchlorate in the commercial manufacture of large-scale rocket motors.*

NFPA 400 Section 1.1.2.2 states: *This code shall not apply to the following:*
(1) Storage or use of hazardous materials for individual use on the premises of one- and two-family dwellings
(2) Explosives or blasting agents, which are regulated by NFPA 495, Explosive Materials Code, and display fireworks, 1.3 G, which are regulated by NFPA 1124, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles
(3) Refrigerants and refrigerant oil contained within closed cycle refrigeration systems complying with the fire code and the mechanical code adopted by the jurisdiction
(4) High hazard contents stored or used in farm buildings or similar occupancies and in remote locations for on premises agricultural use
(5) Corrosive materials in stationary batteries utilized for facility emergency power or uninterrupted power supply, or similar purposes, in accordance with NFPA 1, Fire Code
(6) Aerosols complying with NFPA 30B, Code for the Manufacture and Storage of Aerosol Products
(7) Consumer fireworks, 1.4G complying with NFPA 1124, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles
(8) Corrosive materials displayed in original packaging in mercantile occupancies and intended for personal or household use or as building materials
(9) Flammable and combustible liquids having no other physical or health hazard properties covered by this code
(10) Organic peroxide formulations that are capable of detonation as manufactured or when unpackaged or in authorized shipping containers under conditions of fire exposure, when stored, manufactured, or used in accordance with NFPA 495, Explosive Materials Code
(11) Combustible metals, as defined in NFPA484, Standard for Combustible Metals
(12) LP-Gas complying with NFPA 58, Liquefied Petroleum Gas Code or NFPA 59, Utility LP-Gas Plant Code
(13) When approved, materials that have been satisfactorily demonstrated not to present a potential danger to public health, safety, or welfare, based upon the quantity or condition of storage
(14) The off-site transportation of hazardous materials when in accordance with Department of Transportation (DOT) regulations

NFPA 495 Section 1.1 states: *This code shall apply to the manufacture, transportation, storage, sale, and use of explosive materials.* [**495**: 1.1]

NFPA 495 Sections 1.3.1 through 1.3.6 provide the following exemptions:

Section 1.3.1: *This code shall not apply to the transportation of explosive materials where under the jurisdiction of the U.S. Department of Transportation (DOT). It shall apply, however, to state and municipal supervision of compliance with U.S. DOT 49 CFR 100–199.*

Section 1.3.2: *This code shall not apply to the transportation and use of military explosives by federal or state military agencies, nor shall it apply to the transportation and use of explosive materials by federal, state, or municipal agencies while engaged in normal or emergency performance of duties.*

Section 1.3.3: *This code shall not apply to the manufacture of explosive materials under the jurisdiction of the U.S. Department of Defense (DOD). This code also shall not apply to the distribution or storage of explosive materials by military agencies of the United States, nor shall it apply to arsenals, navy yards, depots, or other establishments owned or operated by, or on behalf of, the United States.*

Section 1.3.4: *This code shall not apply to pyrotechnics such as flares, fuses, and railway torpedoes. It also shall not apply to fireworks and pyrotechnic special effects as defined in NFPA 1123, Code for Fireworks Display; NFPA 1124, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles; and NFPA 1126, Standard for the Use of Pyrotechnics Before a Proximate Audience.*

Section 1.3.5: *This code shall not apply to model and high power rocketry as defined in NFPA 1122, Code for Model Rocketry; NFPA 1125, Code for the Manufacture of Model Rocket and High Power Rocket Motors; and NFPA1127, Code for High Power Rocketry.*

Section: 1.3.6: *This code shall not apply to the use of explosive materials in medicines and medicinal agents in the forms prescribed by the United States Pharmacopeia or the National Formulary.*

Renumber existing Annex C to become Annex D.

101 First Revision

Insert after 3.3.230

Renovation. The replacement in kind, strengthening, or upgrading of building elements, materials, equipment, or fixtures, that does not result in a reconfiguration of the building spaces within.

Substantiation:

The definition of Renovation was inadvertently dropped from Section 3.3 of the 2015 edition of the Code. The definition, as it correctly appears in 43.2.2.1.2, needs to be reinserted into Chapter 3.

101 First Revision

11.1.1 Application. The requirements of Sections 11.1 through 11.11 shall apply to occupancies regulated by Chapters 12 through 42 that are in a special structure. The applicable provisions of Chapters 12 through 42 shall apply, except as modified by this chapter. Section 11.8 shall apply to all new high-rise buildings. Section 11.8 shall apply to existing high-rise buildings only where specifically required by Chapters 12 through 42.

Substantiation:

Since the 2012 edition of the Code, Section 11.8 has applied to all new high-rise buildings. See 11.8.11(1). Existing high-rise buildings continue to fall under the requirements of Section 11.8 only where specifically required by Chapters 12 through 42.

101 First Revision

6.1.14.2.3 Separated Occupancy. A multiple occupancy where the occupancies are separated by fire barriers ~~resistance–rated assemblies~~.

Substantiation:
The term *fire barrier* needs to be used consistently for coordination with the terminology and requirements of Chapter 8 for such assemblies.

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101 First Revision

6.1.14.4 Separated Occupancies. *(See also 6.1.14.1.2.)*

6.1.14.4.1 Where separated occupancies are provided, each part of the building comprising a distinct occupancy, as described in this chapter, shall be completely separated from other occupancies by fire barriers ~~fire-resistive assemblies~~, as specified in ~~6.1.14.4.2, 6.1.14.4.3,~~ Table 6.1.14.4.1(a), ~~and~~ Table 6.1.14.4.1(b), and 6.1.14.4.2 through 6.1.14.4.4, unless separation is provided by approved existing separations or as otherwise permitted by 6.1.14.4.6.

6.1.14.4.2 Occupancy ~~separations~~ separation fire barriers shall be classified as 3-hour fire resistance–rated, 2-hour fire resistance–rated, or 1-hour fire resistance–rated and shall meet the requirements of Chapter 8.

6.1.14.4.3 The fire barrier minimum fire resistance rating specified in Table 6.1.14.4.1(a) and Table 6.1.14.4.1(b) shall be permitted to be reduced by 1 hour, but in no case shall it be reduced to less than 1 hour, where the building is protected throughout by an approved automatic sprinkler system in accordance with 9.7.1.1(1) and supervised in accordance with 9.7.2, unless prohibited by the double-dagger footnote entries in the tables.

6.1.14.4.4 Occupancy ~~separations~~ separation fire barriers shall be vertical, horizontal, or both or, when necessary, of such other form as required to provide complete separation between occupancy divisions in the building.

6.1.14.4.5* Each separated portion of the building shall comply with the requirements for the occupancy therein.

6.1.14.4.6 Where permitted in Chapters 11 through 43, atrium walls shall be permitted to serve as part of the separation required by 6.1.14.4.1 for creating separated occupancies on a story-by-story basis, provided all of the following are met:

(1) The atrium is separated from adjacent areas by walls that are smoke partitions in accordance with Section 8.4.

(2) Doors in the smoke partitions required by 6.1.14.4.6(a) are equipped with positive latching hardware.

(3) The atrium meets the provisions of 8.6.7 that are applicable to new atriums.

Substantiation:
The term *fire barrier* needs to be used consistently for coordination with the terminology and requirements of Chapter 8 for such assemblies.

5000 First Revision

6.2.2.3 Separated Occupancy. A multiple occupancy where the occupancies are separated by fire barriers ~~resistance-rated assemblies~~.

Substantiation:
The term *fire barrier* needs to be used consistently for coordination with the terminology and requirements of Chapter 8 for such assemblies.

5000 First Revision

6.2.4 Separated Occupancies. *(See also 6.2.1.2.)*

6.2.4.1 Where separated occupancies are provided, each part of the building comprising a distinct occupancy, as described in this chapter, shall be completely separated from other occupancies by fire barriers ~~fire-resistive assemblies~~, as specified in ~~6.2.4.2 through 6.2.4.5,~~ Table 6.2.4.1.1(a), ~~and~~ Table 6.2.4.1.1(b), and 6.2.4.2 through 6.2.4.5.

6.2.4.1.1 Separation of occupancies having high hazard contents shall also be in accordance with 34.3.2.3 and 34.2.5.2 except as otherwise permitted by 6.2.4.7.

6.2.4.2 Occupancy ~~separations~~ separation fire barriers shall meet the requirements of Chapter 8.

6.2.4.3 The fire barrier minimum fire resistance rating specified in Table 6.2.4.1.1(a) and Table 6.2.4.1.1(b) shall be permitted to be reduced by 1 hour, but in no case shall it be reduced to less than 1 hour, where the building is protected throughout by an approved automatic sprinkler system in accordance with 55.3.1.1(1) and electrically supervised in accordance with 55.3.2, unless prohibited by the double-dagger footnote entries in the tables.

6.2.4.4 Occupancy ~~separations~~ separation fire barriers shall be vertical, horizontal, or both or, when necessary, of such other form as required to provide complete separation between occupancy divisions in the building.

6.2.4.5 Where the occupancy separation fire barrier is horizontal, structural members supporting the separation shall be protected by an equivalent fire-resistive construction.

6.2.4.6 The type of construction required for the building shall be determined in accordance with Section 7.4.

~~**6.2.4.7** Where the occupancy separation is horizontal, structural members supporting the separation shall be protected by an equivalent fire-resistive construction.~~

~~**6.2.4.8** The type of construction required for the building shall be determined in accordance with Section 7.4.~~

6.2.4.9* Each separated portion of the building shall comply with the requirements for the occupancy therein.

6.2.4.10 Where permitted in Chapters 15 through 31 and 33, atrium walls shall be permitted to serve as part of the separation required by 6.2.4.1 for creating separated occupancies on a story-by-story basis, provided all of the following are met:

(1) The atrium is separated from adjacent areas by walls that are smoke partitions in accordance with Section 8.10.

(2) Doors in the smoke partitions required by 6.2.4.7(a) are equipped with positive latching hardware.

(3) The atrium meets the provisions of 8.12.3.

Substantiation:
The term *fire barrier* needs to be used consistently for coordination with the terminology and requirements of Chapter 8 for such assemblies. The provisions of 6.2.4.7 and 6.2.4.8 are being deleted as they are duplicates of 6.2.4.5 and 6.2.4.6.

Cote, Ron

From: Harrington, Greg
Sent: Thursday, March 12, 2015 10:08 AM
To: Cote, Ron
Cc: Solomon, Robert; Bigda, Kristin
Subject: NFPA 5000 Annex F - In-Building Radio Enhancement Systems

Ron:

I believe you handle Ch. 33 of NFPA 5000. In A.33.3.1.2(2), there is a reference to Annex F for public safety radio enhancement systems (this is the only reference to Annex F in the Code, so I'm assuming BLD-FUN is responsible for Annex F). There are several issues:

1. A.33.3.1.2(2) references the 2007 edition of NFPA 72 – this should be updated to the current edition.

2. In Section F.1, there is a reference to Annex G – it should be Annex F. This annex was Annex G in the 2009 edition, in which it first appeared. It was renumbered (relettered?) as Annex F in the 2012 edition.

3. Annex F appears to be similar to the former Annex O of NFPA 1, which was deleted for the 2012 edition in favor of a mandatory reference to NFPA 72, which assumed responsibility for the subject. You may want to ask BLD-FUN to consider deleting Annex F of NFPA 5000 so as to not conflict with NFPA 72 and NFPA 1.

Also, in the Note at the beginning of Annex E (BLD-MEA), there is an incorrect reference to Annex F – it should be Annex E (again, likely due to renumbering). Lastly, I believe the title of Annex E should be Supplemental Evacuation Equipment, rather than Supplement Evacuation Equipment.

Thanks.

--Greg

Gregory Harrington, P.E.
Principal Fire Protection Engineer
NFPA – Quincy, MA USA

5000 First Revision:

A.33.3.1.2(2) ~~Public safety radio~~ Two-way radio communication enhancement systems provide for greater flexibility and safety for emergency responders during in-building operations. ~~To~~ The two-way radio communication enhancement systems provisions of NFPA 72 can be used to facilitate adoption of code language prescribing design, installation, testing, and maintenance criteria for ~~in-building public safety radio enhancement systems,~~ such systems~~, Annex F offers guidance. AHJs are directed to Subsection 6.10.2 of the 2007 edition of *NFPA 72*, which permits the use of in-building public safety radio enhancement systems in lieu of two-way fire fighter telephone systems.~~

Substantiation

NFPA 72 addresses two-way radio communication enhancement systems in sufficient detail that NFPA 5000 need not provide similar material. The material is easily found in Section 24.5 of NFPA 72, so as to preclude the need to cite the section number within the annex of NFPA 5000.

5000 First Revision:
(delete Annex F)

~~Annex F In-Building Radio Systems~~

~~*This annex is not part of the requirements of this NFPA document unless specifically adopted by the authority having jurisdiction.*~~

~~F.1 Scope.~~

~~Where installed, in-building public safety radio enhancement systems shall meet the requirements of Annex G.~~

~~F.2 General.~~

~~The AHJ shall be permitted to determine the frequency spectrum that these systems will enhance to ensure emergency responders communications systems will operate within and to and from the building without interference. In addition, AHJs shall be permitted to determine if the systems to be enhanced are analog or digital systems.~~

~~F.3 Public Safety Radio Enhancement System.~~

~~F.3.1 General.~~

~~**F.3.1.1 Non-Interference.** No amplification system capable of operating on frequencies or causing interference on frequencies assigned to the jurisdiction by the Federal Communications Commission (FCC) shall be installed without prior coordination and approval of the AHJ. The building manager/owner shall suspend and correct other equipment installations that degrade the performance of the public safety radio system or public safety radio enhancement system.~~

F.3.1.2 Approval and Permit. Plans shall be submitted for approval prior to installation. At the conclusion of successful acceptance testing, a renewable permit shall be issued for the public safety radio enhancement system by the AHJ.

F.3.2 Radio Coverage. Radio coverage shall be provided throughout the building as a percentage of floor area, as stated in F.3.2.1 through F.3.2.3.

F.3.2.1 Critical Areas. Critical areas, such as the emergency command center(s), the fire pump room(s), exit stairs, exit passageways, elevator lobbies, standpipe cabinets, sprinkler sectional valve locations, and other areas deemed critical by the AHJ, shall be provided with 99 percent floor area radio coverage.

F.3.2.2 General Building Areas. General building areas shall be provided with 90 percent floor area radio coverage.

F.3.2.3 Amplification Components. Buildings and structures that cannot support the required level of radio coverage shall be equipped with a radiating cable system and/or a distributed antenna system (DAS) with FCC certified signal boosters or systems otherwise approved in order to achieve the required adequate radio coverage.

F.3.3 Signal Strength.

F.3.3.1 Inbound. A minimum inbound signal strength of 95 dBm or other signal strength as required by the AHJ shall be provided throughout the coverage area.

F.3.3.2 Outbound. A minimum outbound signal strength of 95 dBm at the donor site or other signal strength as required by the AHJ shall be provided from the coverage area.

F.3.3.3 Isolation. If a donor antenna exists, isolation shall be maintained between the donor antenna and all inside antennas and shall be a minimum of 15 dB above the signal booster gain under all operating conditions.

F.3.4 System Frequencies. The public safety radio enhancement system shall be capable of transmitting all public safety radio frequencies assigned to the jurisdiction and be capable of using any modulation technology.

Note: Modulation technologies include analog and digital modulation.

F.3.4.1 List of Assigned Frequencies. The AHJ shall maintain a list of all inbound/outbound frequency pairs for distribution to system designers.

F.3.4.2 Frequency Changes. Systems shall be capable of upgrade to allow for instances where the jurisdiction changes or adds system frequencies, in order to maintain radio system coverage as originally designed.

Note: There is currently an ongoing national effort to eliminate current interference issues between cellular carriers and public safety bands in the 800 MHz band. This effort could revise the actual frequencies for public agencies within this band. The public safety radio enhancement system design shall be capable of being changed to accommodate updated frequencies in order to allow maintenance of the minimum system design criteria.

F.3.5 System Components.

F.3.5.1 Component Approval. Components utilized in the installation of the public safety radio enhancement system, such as repeaters, transmitters, receivers, signal boosters, cabling, and fiber distributed antenna system shall be approved and shall be compatible with the public safety radio system.

F.3.5.2 Component Enclosures. All repeater, transmitter, receiver, and signal booster components shall be contained in a NEMA 4 or 4X type enclosure(s).

F.3.5.3 External Filters. Permanent external filters and attachments shall not be permitted.

F.3.5.4 Signal Booster Components. If used, signal boosters shall meet the following requirements, as well as any other requirements determined by the AHJ:

(1) Signal boosters shall have FCC certification prior to installation.
Note: All repeaters, transmitters, receivers, and signal boosters shall be permitted to be installed and operated in a manner consistent with 47 CFR. Within these regulations is a mandatory requirement that repeaters, transmitters, and signal boosters have FCC "certification." Receivers do not normally have a FCC certification requirement but must comply with other applicable FCC regulations. FCC certification is a formal procedure that verifies the equipment meets certain minimum FCC technical specifications. Each brand and model type is issued a distinct FCC certification number. Use of repeaters, transmitters, or signal boosters that do not have an existing FCC-issued certification is a violation of federal law, and users are subject to fine and/or imprisonment. A label displaying the exact FCC certification number shall be placed in a visible place on the equipment itself. FCC certification verification shall be permitted to be obtained from any FCC office or on-line at https://fjallfoss.fcc.gov/oetcf/eas/reports/GenericSearch.cfm

(2) All signal boosters shall be compatible with both analog and digital communications simultaneously at the time of installation. The AHJ shall provide the maximum acceptable propagation delay standard.

F.3.6 Power Supplies. At least two independent and reliable power supplies shall be provided, one primary and one secondary.

F.3.6.1 Monitoring the Integrity. Monitoring the integrity of power supplies shall be in accordance with 4.4.7.3 of *NFPA 72*, *National Fire Alarm and Signaling Code*.

F.3.6.2 Primary Power Source. The primary power source shall be supplied from a dedicated branch circuit and comply with 4.4.1.4 of *NFPA 72*, *National Fire Alarm and Signaling Code*.

F.3.6.3 Secondary Power Source. The secondary power source shall consist of one of the following:

(1) A storage battery dedicated to the system with at least 12 hours of 100 percent system operation capacity.
Note: The battery requirement of 12 hours for the public safety radio enhancement system is purposely longer than the 5 minute performance requirement for general evacuation and the 15 minute performance requirement for emergency voice/alarm communication

systems. This is due to the primary mission of the systems, where the fire alarm system's primary mission is to assist fire detection and occupant egress, and the public safety radio enhancement system's primary mission is to assist fire department operations, which might take longer than occupant egress.

(2) An automatic starting, engine-driven generator serving the dedicated branch circuit for the system and storage batteries dedicated to the system with at least 2 hours of 100 percent system operation capacity.

F.3.6.4 Battery Systems. The battery system shall automatically charge in the presence of external power input. The battery system shall be contained in one NEMA 4 or 4X type enclosure.

F.3.6.5 Generator. An engine-driven generator shall be arranged in accordance with 4.4.1.9.3.1(A) of *NFPA 72*, *National Fire Alarm and Signaling Code*.

F.3.7 System Monitoring.

F.3.7.1 Fire Alarm System. The public safety radio enhancement system shall include automatic supervisory and trouble signals for malfunctions of the signal booster(s) and power supplies that are annunciated by the fire alarm system, as follows:

(1) The integrity of the circuit monitoring signal booster(s) and power supply(ies) shall comply with 4.4.7.1 of *NFPA 72*, *National Fire Alarm and Signaling Code*.

(2) System and signal booster supervisory signals shall include the following:

(a) Antenna malfunction

(b) Signal booster failure

(3) Power supply supervisory signals shall include the following for each signal booster:

(a) Loss of normal ac power

(b) Failure of battery charger

(c) Low battery capacity, alarming at 70 percent of battery capacity

F.3.7.2 Dedicated Panel. A dedicated monitoring panel shall be provided within the emergency command center to annunciate the status of all signal booster locations. The monitoring panel shall provide visual and labeled indication of the following for each signal booster:

(1) Normal ac power

(2) Signal booster trouble

(3) Loss of normal ac power

(4) Failure of battery charger

(5) Low battery capacity

Note: Due to the longer back-up battery requirement for the public safety radio enhancement system, it is recognized that the fire alarm system might not be available to provide monitoring of radio system signals, including low battery signals. Therefore, redundant status annunciation shall be permitted to be required to provide local signals to the incident commander or their designee at the emergency command center.

F.3.8 Technical Criteria. The AHJ shall maintain a document of technical information specific to its requirements. This document shall contain, as a minimum, the frequencies required, the location and effective radiated power (ERP) of radio sites used by the public safety radio enhancement system, the maximum propagation delay (in microseconds), a list of specifically approved system components, and other supporting technical information necessary to direct system design.

F.3.9 Testing.

F.3.9.1 Signal Level Testing. Signal level testing shall be conducted to verify the signal strengths as required in F.3.3 at the following times:

(1) Initial assessment of radio coverage in accordance with F.3.2.1 and F.3.2.2 for new or existing buildings

(2) After installation or modification of public safety radio enhancement system needed to assure compliance with F.3.2.3

(3) On an annual basis or other interval as specified by the AHJ

F.3.9.2 System Commissioning Testing. System commissioning tests shall comply with the following:

(1) The building owner shall be responsible to ensure that a commissioning test of the public safety radio enhancement system occurs prior to final acceptance testing with the AHJ.

(2) The commissioning test shall ensure that two-way coverage on each floor of the building meets the minimum coverage requirements of F.3.2.1 and F.3.2.2.

(3) Tests shall be made using the frequencies assigned to the jurisdiction.

(4) Testing shall be coordinated with the AHJ to ensure no undue interference to any public safety operations.

(5) All testing shall be done on frequencies authorized by the FCC.

F.3.9.3 Test Procedures. The test plan shall ensure testing throughout the building. Test procedures shall be as directed by the AHJ.

Note: Testing procedures typically are done on a grid system. A grid is overlaid onto a floor area to provide 20 grid cells. Grid cells are provided with definite minimum and maximum dimensions. For most buildings, using a minimum grid dimension of 20 ft (6.1 m) and a maximum grid dimension of 80 ft (24.4 m) will suffice to encompass the entire floor area. Where a floor exceeds 128,000 ft^2 (11,900 m^2), which is the floor area that can be covered by the maximum grid dimension of 80 ft (24.4 m), it is recommended that the floor be subdivided into

sectors each having an area of less than or equal to 128,000 ft^2 (11,900 m^2), and each sector be tested individually with 20 grid cells in each sector. Signal strength measurements should be taken at the center of each grid and should be performed using standardized parameters as specified in F.3.9.4.

Note: Signal strength typically is recorded on the Delivered Audio Quality (DAQ) scale. This is a universal standard often cited in system designs and specifications, using the following measures:

DAQ 1: Unusable, speech present but unreadable.

DAQ 2: Understandable with considerable effort. Frequent repetition due to noise/distortion.

DAQ 3: Speech understandable with slight effort. Occasional repetition required due to noise/distortion.

DAQ 3.5: Speech understandable with repetition only rarely required. Some noise/distortion.

DAQ 4: Speech easily understood. Occasional noise/distortion.

DAQ 4.5: Speech easily understood. Infrequent noise/distortion.

DAQ 5: Speech easily understood.

The minimum allowable DAQ for each grid cell typically is 3. Not more than two nonadjacent grid cells should be allowed to fail the test. In the event that three of the areas fail the test, or if two adjacent areas fail the test, in order to be more statistically accurate, the testing grid resolution should be doubled. This would require decreasing the size of the grids to one-half the dimension used in the failed test, to a minimum of 10 ft (3 m) and a maximum of 40 ft (12.2 m). Further, to cover the same floor area, the number of grids is quadrupled to 80 grids. Not more than eight nonadjacent and/or five adjacent grid cells should then be allowed to fail the test. In the event that nine or more nonadjacent and/or six or more adjacent grid cells fail the test, consideration should be given to redesigning and reinstalling the public safety radio enhancement system to meet the minimum system design requirements. Failures should not be allowed in critical areas. Measurements should be made with the antenna held in a vertical position at 3 ft to 4 ft (0.9 m to 1.2 m) above the floor. The DAQ readings should be recorded on small-scale drawings that are used for testing with the AHJ. In addition, the gain values of all amplifiers should be measured and the test measurement results should be kept on file with the building owner so that the measurements can be verified each year during annual tests.

F.3.9.4 Measurement Parameters. Signal levels shall be measured to ensure the system meets the criteria of F.3.3 according to parameters as directed by the AHJ.

Note: Downlink measurements should be made with the following standardized parameters:

(1) A calibrated spectrum analyzer or a calibrated automatic signal level measurement recording system

(2) Receive antennas of equal gain to the agency's standard portable radio antenna, oriented vertically, with a centerline between 3 ft to 4 ft (0.9 m to 1.2 m) above floor

(3) A resolution bandwidth nearest the bandwidth of the channel under test

(4) Levels recorded while walking an "X" pattern, with the center of the pattern located approximately in the center of each grid area

(5) The linear distance of each side of the "X" equal to at least 10 percent of the length of the grid's side, and a minimum length of 10 ft (3 m)

(6) Measurements sampled in averaging mode to include a minimum of one sample per each 5 ft (1.5 m) traveled recorded with not less than five samples per measurement recorded per side of the "X"

F.3.9.5 Acceptance Test. An acceptance test of the public safety radio enhancement system shall be scheduled with the AHJ. Acceptance test procedures and requirements shall be as directed by the AHJ.

Note: Typically, acceptance tests are required by the AHJ prior to building occupancy. As-built drawings should be provided along with other information required from the signal level, and commissioning tests, including a full report with grid locations, DAQ measurements, and amplifier gain values, should be provided at the acceptance test. The acceptance test typically entails a random test by the AHJ of radio communication in various portions of the building, especially including the critical areas. The AHJ can review any test documentation and ensure that the findings of the commissioning test with respect to DAQ levels and gain values are supported by the acceptance test.

If amplification systems are utilized in the public safety radio enhancement system, a spectrum analyzer shall be utilized to insure spurious oscillations are not being generated or unauthorized carriers are being repeated in violation of FCC regulations. This testing should be conducted at the time of installation and during subsequent inspections. Downlink and uplink spectrum should be recorded with a maximum-hold screen capture at the active system air interfaces with the system under normal load and at least one uplink carrier active on the indoor portion of the system. Measurements should be analyzed for correct gains on both uplink and downlink paths, noise floor elevation from active components, intermodulation, and other parameters determined necessary by the AHJ.

Gain values of all amplifiers should be measured and the results kept on file with the building owner and the AHJ. In the event that the measurement results become lost, the building owner will need to repeat the acceptance test to reestablish the gain values.

F.3.9.6 Annual Tests. Where a public safety radio enhancement system is required, it shall be the building owner's responsibility to have all active components of the system, such as signal boosters, power supplies and backup batteries tested at a minimum of once every 12 months. The AHJ shall be notified in advance and shall direct annual test procedures and requirements.

Note: Typically, annual tests require several items to be checked. Annual tests should include all procedures encompassed in F.3.9.1 through F.3.9.4. Signal boosters should be tested to ensure that the gain is the same as it was upon initial installation and acceptance. Backup batteries and power supplies should be tested under load for a period of 1 hour to verify that they will properly operate during an actual power outage. Other active components are typically checked to

~~determine that they are operating within the manufacturer's specifications for the intended purpose.~~

~~**F.3.10 Personnel Qualification.** Note: Many manufacturers of signal boosters provide certification programs for installing contractors. Local adopting jurisdictions could require certification of public safety radio enhancement system training issued by a nationally recognized organization or school, or a certificate issued by the manufacturer of the equipment being installed, for the installing contractors.~~

~~**F.3.10.1 License or Certification.** All tests shall be conducted, documented, and signed by a person in possession of a current FCC general radiotelephone operator license, acceptable manufacturer/industry certification, electrical engineering license, or as required by the AHJ.~~

~~**F.3.10.2 Documentation.** Copies of license or certification shall be provided to the AHJ as part of an annual permit renewal process.~~

~~**F.3.11 Maintenance.** The building owner shall maintain a service contract for emergency repair with response to the site within 2 hour of notification. A copy of the contract shall be submitted to the AHJ at the time of acceptance testing. If the building owner drops the maintenance contract, the contractor shall notify the AHJ within 24 hours.~~

Substantiation

NFPA 72 addresses two-way radio communication enhancement systems in sufficient detail that NFPA 5000 need not provide similar material. Annex F potentially conflicts with NFPA 72 on this subject. NFPA 72 ids the expert document that should be referenced. NFPA 5000 Annex F is thus being deleted.

Fire Safety Directors - Proposed Standard

From Standards Council's April 2015 meeting agenda

15-4-23	At the March 2014 Standard Council meeting the Council considered the request of the Loss Prevention Procedures and Practices Committee (TC) that NFPA establish a standard for professional practices for facility fire safety planning and fire safety directors. After review of all the material before it, the Council voted to publish a notice to solicit comments on the need for the project, its intended scope and breadth, information on resources on the subject matter, those interested in participating, and other organizations actively involved with the subject. The Council received a number of comments of interest in the development of this project. After review of all of the material before them, the Council voted to establish a task group, which will be chaired by Standards Council Member, Michael Snyder. This Task Group has been charged with developing a scope, a clear determination as to who should be charged with new project, if developed, and what direction should the project cover: industrial facility safety planning or high rise building safety. The Task Group has met twice and will be presenting their report to the Council. See Attachment 15-4-23

NFPA 101

101 First Revision

2.3.2 ANSI Publications. American National Standards Institute, Inc., 25 West 43rd Street, 4th floor, New York, NY 10036.

ANSI A14.3, *Safety Requirements for Fixed Ladders*, ~~1992~~ 2008.

ICC/ANSI A117.1, *American National Standard for Accessible and Usable Buildings and Facilities*, 2009.

ANSI/BHMA A156.3 *Exit Devices*, ~~2008~~ 2014.

BHMA/ANSI A156.19, *American National Standard for Power Assist and Low Energy Power Operated Doors*, ~~2007~~ 2013.

ANSI Z223.1, *National Fuel Gas Code*, ~~2006~~ 2015.

Substantiation:
Updating to relevant current edition of referenced publications.

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101 First Revision

2.3.4 ASME Publications. American Society of Mechanical Engineers, Two Park Avenue, New York, NY 10016-5990. www.asme.org

ASME A17.1/CSA B44, *Safety Code for Elevators and Escalators*, ~~2007~~ 2013.

ASME A17.3, *Safety Code for Existing Elevators and Escalators*, ~~2008~~ 2011.

ASME A17.7/CSA B44.7, *Performance-Based Safety Code for Elevators and Escalators*, 2007.

Substantiation:
Updating to relevant current edition of referenced publications.

NFPA 5000

5000 First Revision

2.3.6 ANSI Publications. American National Standards Institute, Inc., 25 West 43rd Street, 4th floor, New York, NY 10036.

ANSI A14.3, *Safety Requirements for Fixed Ladders*, ~~2002~~ 2008.

ANSI A208.1, *Standard for Particleboard*, ~~1999~~ 2009.

ANSI A1264.1, *Safety Requirements for Workplace Floor and Wall Openings, Stairs and Railing Systems*, 2007.

ANSI Z 97.1, *Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test*, ~~2004~~ 2009.

Substantiation:
Updating to relevant current edition of referenced publications.

5000 First Revision

2.3.9 ASME Publications. American Society of Mechanical Engineers, Two Park Avenue, New York, NY 10016-5990.

ASME A17.1/CSA B 44, *Safety Code for Elevators and Escalators*, ~~2007~~ 2013.

ASME A17.7/CSA B 44.7, *Performance-Based Safety Code for Elevators and Escalators*, 2007.

ASME A18.1, *Safety Standard for Platform Lifts and Stairway Chairlifts*, ~~2008~~ 2014.

ASME B20.1, *Safety Standard for Conveyors and Related Equipment*, ~~2009~~ 2012.

ASME B31.3, *Process Piping*, ~~2008~~ 2014.

Substantiation:
Updating to relevant current edition of referenced publications.

5000 First Revision

2.3.14 BHMA Publications. Builders Hardware Manufacturers Association, 355 Lexington Avenue, 17th floor, New York, NY 10017-6603.

ANSI/BHMA A156.3, *Exit Devices*, ~~2008~~ 2014.

BHMA/ANSI A156.19, *American National Standard for Power Assist and Low Energy Power Operated Doors*, ~~2007~~ 2013.

Substantiation:
Updating to relevant current edition of referenced publications.

Public Input No. 116-NFPA 101-2015 [Global Input]

Replace "Fire Safety Function" with "Emergency Control Function" throughout the document. Add the definition of Emergency Control Functions from NFPA 72 to Chapter 3 which is as follows. (This is from the 2013 Edition of NFPA 72 and the definition from the 2016 should be used once it is published.)

3.3.91* Emergency Control Functions. Building, fire, and emergency control elements or systems that are initiated by the fire a larm or emergency communications system and either increase the level of life safety for occupants or control the spread of the harmful effects of fire or other dangerous products.

Statement of Problem and Substantiation for Public Input

NFPA 101, 9.6.5 references fire safety functions and directs the reader to NFPA 72. However, NFPA 72 has changed the term, so the user won't find "Fire Safety Functions" in NFPA 72. I believe that there is a reference to fire safety functions in each of the occupancy chapters as well so each chapter should see if the new definition works. Functions that operate as a result of CO detection might be covered with the new term.

Submitter Information Verification

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Submittal Date: Thu Jun 04 14:20:20 EDT 2015

Public Input No. 171-NFPA 101-2015 [Global Input]

Change "air traffic control tower" to "airport traffic control tower" throughout this Standard.

Statement of Problem and Substantiation for Public Input

The purpose of this change is to make the terminology of the Life Safety Code consistent with that used by the FAA and the transportation industry.

Submitter Information Verification

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Submittal Date: Fri Jun 19 10:35:10 EDT 2015

Public Input No. 22-NFPA 101-2015 [Global Input]

Throughout standard remove references to the following and replace with the following:

(1) ANSI/FM and replace with FM Approval.

(2) ANSI/UL and replace with UL.

(3) ACI 216.1/TMS 0216.1 and replace with ACI 216.1.

(4) ANSI/ASSE A1264.1 and ANSI/ASSE A1264.2 and replace with ANSI A1264.1 and ANSI A1264.2.

(5) American Society of Mechanical Engineers and replace with ASME International.

(6) ANSI A14.3, Safety Requirements for Fixed Ladders, 1992 and replace with Ladders - Fixed - Safety Requirements, 2008.

(7) ASCE/SFPE 29 and replace with ASCE/SEI/SFPE 29

(8) FM Approval Standard 6921 and replace with FM Approval 6021.

(9) ICC/ANSI A117.1 American National Standard for Accessible and Usable Buildings and Facilities and replace with ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities.

(10) BHMA/ANSI A156.19 American National Standard for Power Assist and Low Energy Power Operatered Doors and replace with Power Assist and Low Energy Power Operatered Doors.

Statement of Problem and Substantiation for Public Input

The recommended revisions correspond to PI-23 and PI-24.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 23-NFPA 101-2015 [Section No. 2.3]	Referenced current SDO names, addresses, standard names, numbers, and editions.
Public Input No. 24-NFPA 101-2015 [Section No. C.1.2]	Referenced current SDO names, addresses, standard names, numbers, and editions.

Submitter Information Verification

Submitter Full Name: Aaron Adamczyk
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City:
State:
Zip:

Submittal Date: Mon Feb 09 20:34:13 EST 2015

Public Input No. 33-NFPA 101-2015 [Global Input]

1. Delete the reference in Section 2.2 as follows:

~~NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and pyrotechnic Articles*, 2013 edition.~~

2. Delete 3.3.49 and A.3.3.49 as follows:

~~**3.3.49* Consumer Fireworks, 1.4G. (Formerly known as Class C, Common Fireworks.)** A ny small fireworks device designed primarily to produce visible effects by combustion that complies with the construction, chemical composition, and labeling regulations of the U.S. Consumer Product Safety Commission, as set forth in 16 CFR, Parts 1500 and 1507. Some small devices designed to produce audible effects are included, such as whistling devices, ground devices containing 0.8 gr (50 mg) or less of explosive composition (salute powder), and aerial devices containing 2 gr (130 mg) or less of explosive composition (salute powder) per explosive unit.~~

~~**A.3.3.49 Consumer Fireworks, 1.4G.** Consumer Fireworks, 1.4G contain limited quantities of pyrotechnic composition per unit and do not pose a mass explosion hazard where stored; therefore, they are not required to be stored in a magazine. Consumer Fireworks, 1.4G are normally classed as Explosive, 1.4G and described as Fireworks UN0336 by the U.S. Department of Transportation (U.S. DOT). (See Annex C of NFPA 1124, Code for the Manufacture, Transportation, Storage, and Retail Sales o f Fireworks and Pyrotechnic Articles.)~~

3. Delete the reference in C.1.1 as follows:

~~NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles*, 2013 edition.~~

Additional Proposed Changes

File Name	Description	Approved
101-15-1_Log_1138_SC_14-8-25_CONCURRENT_-_TIA_101-15-1.pdf	NFPA TIA 15-1 Log No. 1138	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from Tentative Interim Amendment 15-1 (Log 1138) issued by the Standards Council on August 14, 2014 and per the NFPA Regs., needs to be reconsidered by the Technical Committee for the next edition of the Document.

Submitter's Substantiation:
Deletes reference to NFPA 1124, or a consumer fireworks provision, or both. Consistent with NFPA Standards Council Decision D#14-1, issued March 3, 2014, NFPA has temporarily withdrawn NFPA 1124, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles. The effect of this decision is that no recognized criteria for the subjects previously governed by NFPA 1124 exist within the NFPA codes and standards system; thus, this TIA works to align NFPA 101 with that circumstance.

Emergency Nature:

NFPA 1124 has been temporarily withdrawn as a result of Standards Council Decision D#14-1, which was issued March 3, 2014, subsequent to completion of the NFPA 101-2015 Second Draft, but prior to the issuance of NFPA 101-2015. Accordingly, this TIA is intended to be issued concurrently with NFPA 101-2015.

Submitter Information Verification

Submitter Full Name: TC ON SAF-FUN
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Submittal Date: Fri Feb 27 14:40:39 EST 2015

Tentative Interim Amendment

NFPA 101®

Life Safety Code®

2015 Edition

Reference: Various
TIA 15-1
(SC 14-8-25 / TIA Log #1138)

Note: Text of the TIA issued and incorporated into the text of the document, therefore no separate publication is necessary.

1. Delete the reference in Section 2.2 as follows:

~~NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and pyrotechnic Articles*, 2013 edition.~~

2. Delete 3.3.49 and A.3.3.49 as follows:

~~**3.3.49* Consumer Fireworks, 1.4G. (Formerly known as Class C, Common Fireworks.)** Any small fireworks device designed primarily to produce visible effects by combustion that complies with the construction, chemical composition, and labeling regulations of the U.S. Consumer Product Safety Commission, as set forth in 16 CFR, Parts 1500 and 1507. Some small devices designed to produce audible effects are included, such as whistling devices, ground devices containing 0.8 gr (50 mg) or less of explosive composition (salute powder), and aerial devices containing 2 gr (130 mg) or less of explosive composition (salute powder) per explosive unit.~~

~~**A.3.3.49 Consumer Fireworks, 1.4G.** Consumer Fireworks, 1.4G contain limited quantities of pyrotechnic composition per unit and do not pose a mass explosion hazard where stored; therefore, they are not required to be stored in a magazine. Consumer Fireworks, 1.4G are normally classed as Explosive, 1.4G and described as Fireworks UN0336 by the U.S. Department of Transportation (U.S. DOT). (See Annex C of NFPA 1124, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles.)~~

3. Delete the reference in C.1.1 as follows:

~~NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles*, 2013 edition.~~

Issue Date: August 14, 2014
Effective Date: September 3, 2014

(**Note: For further information on NFPA Codes and Standards, please see** www.nfpa.org/codelist)
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NATIONAL FIRE PROTECTION ASSOCIATION

Public Input No. 34-NFPA 101-2015 [Global Input]

1. Delete the reference in 36.4.5.3(8) as follows:

~~NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and pyrotechnic Articles*~~

2. Delete 36.4.6 as follows:

~~**36.4.6 Retail Sales of Consumer Fireworks, 1.4G.** M e rcantile occupancies in which the retail sale of consumer fireworks,~~

~~1 . 4 G , is conducted shall comply with NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of*~~

~~*Fireworks and Pyrotechnic Articles* .~~

3 . Delete the reference in 37.4.5.3(8) as follows:

~~NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and pyrotechnic Articles*~~

4. Delete 37.4.6 as follows:

~~**37.4.6 Retail Sales of Consumer Fireworks, 1.4G.** M e rcantile occupancies in which the retail sale of consumer fireworks,~~

~~1 . 4 G , is conducted, other than approved existing facilities, shall comply with NFPA1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles* .~~

Additional Proposed Changes

File Name	Description	Approved
101-15-2_Log_1144_SC_14-8-26_CONCURRENT_-_TIA_101-15-2.pdf	NFPA TIA 15-2 (Log #1144)	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from Tentative Interim Amendment 15-2 (Log 1144) issued by the Standards Council on August 14, 2014 and per the NFPA Regs., needs to be reconsidered by the Technical Committee for the next edition of the Document.

Submitter's Substantiation:
Deletes reference to NFPA 1124, or a consumer fireworks provision, or both. Consistent with NFPA Standards Council Decision D#14-1, issued March 3, 2014, NFPA has temporarily withdrawn NFPA 1124, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles. The effect of this decision is that no recognized criteria for the subjects previously governed by NFPA 1124 exist within the NFPA codes and standards system; thus, this TIA works to align NFPA 101with that circumstance.
Emergency Nature:
NFPA 1124 has been temporarily withdrawn as a result of Standards Council Decision D#14-1, which was issued March 3, 2014, subsequent to completion of the NFPA 101-2015 Second Draft, but prior to the issuance of NFPA 101-2015. Accordingly, this TIA is intended to be issued concurrently with NFPA 101-2015.

Submitter Information Verification

Submitter Full Name: TC ON SAF-MER
Organization: NFPA 101 TC on Mercantile and Business Occupancies
Street Address:
City:
State:
Zip:
Submittal Date: Fri Feb 27 15:05:40 EST 2015

Tentative Interim Amendment

NFPA 101®

Life Safety Code®

2015 Edition

Reference: Various
TIA 15-2
(SC 14-8-26 / TIA Log #1144)

Note: Text of the TIA issued and incorporated into the text of the document, therefore no separate publication is necessary.

1. Delete the reference in 36.4.5.3(8) as follows:

~~NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and pyrotechnic Articles*~~

2. Delete 36.4.6 as follows:

~~**36.4.6 Retail Sales of Consumer Fireworks, 1.4G.** Mercantile occupancies in which the retail sale of consumer fireworks, 1.4G, is conducted shall comply with NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles.*~~
7
3. Delete the reference in 37.4.5.3(8) as follows:

~~NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and pyrotechnic Articles*~~

4. Delete 37.4.6 as follows:

~~**37.4.6 Retail Sales of Consumer Fireworks, 1.4G.** Mercantile occupancies in which the retail sale of consumer fireworks, 1.4G, is conducted, other than approved existing facilities, shall comply with NFPA1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles.*~~

Issue Date: August 14, 2014
Effective Date: September 3, 2014

(**Note: For further information on NFPA Codes and Standards, please see** www.nfpa.org/codelist)
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NATIONAL FIRE PROTECTION ASSOCIATION

Public Input No. 53-NFPA 101-2015 [Global Input]

1 . Revise 12.4.1, from what was done by Second Revision SR-95 (Annual 2014 revision cycle – NFPA 101 Second Draft), to read as follows:

12.4.1 Life Safety Evaluation.

12.4.1.1* General. Where a life safety evaluation is required by other provisions of this *Code*, it shall comply with the following:

(1) The life safety evaluation shall be performed by persons acceptable to the AHJ.

(2) The life safety evaluation shall include a written assessment of safety measures for conditions listed in 12.4.1.2 and of the

building systems and facility management in accordance with 12.4.1.3.

(3) The life safety evaluation shall be approved annually by the AHJ and shall be updated for special or unusual conditions in accordance with the provisions of 13.4.1 for existing assembly occupancies.

12.4.1.2 Conditions to Be Assessed. Life safety evaluations shall include an assessment of all of the following conditions and related appropriate safety measures:

(1) Nature of the events and the participants and attendees

(2) Access and egress movement, including crowd density problems

(3) Medical emergencies

(4) Fire hazards

(5) Permanent and temporary structural systems

(6) Severe weather conditions

(7) Earthquakes

(8) Civil or other disturbances

(9) Hazardous materials incidents within and near the facility

(10) Relationships among facility management, event participants, emergency response agencies, and others having a role in the events accommodated in the facility

1 2. 4 .1 .3* Building Systems and Facility Management Assessments. Life safety evaluations shall include assessments of both building systems and facility management upon which reliance is placed for the safety of facility occupants, and such assessments shall consider scenarios appropriate to the facility.

12.4.1.3.1 Building Systems. Prior to issuance of the building permit, the design team shall provide the AHJ with building systems documentation in accordance with 12.4.1.4.

1 2 .4.1.3.2 Facility Management. Prior to issuance of the certificate of occupancy, the facility management shall provide the AHJ with facility management documentation in accordance with 12.4.1.5.

12.4.1.3.3 Life Safety Evaluation.

12.4.1.3.3.1 Prior to issuance of the building permit, the persons performing the life safety evaluation shall confirm that the building systems provide appropriate safety measures.

12.4.1.3.3.2 Prior to issuance of the certificate of occupancy, the persons performing the life safety evaluation shall confirm that the facility management and operational plans provide appropriate safety measures.

12.4.1.3.3.3 The AHJ shall approve the acceptable persons performing the life safety evaluation in a timely manner to enable the design team and facility management to resolve concerns to the satisfaction of the persons performing the life safety evaluation prior to their submission.

12.4.1.4 Life Safety Building Systems Document. The AHJ shall be provided with a life safety building systems document providing the information required in 12.4.1.4.2 through 12.4.1.4.4.

12.4.1.4.1 Document Distribution. The persons performing the life safety evaluation, the AHJ, the A/E design team, and the building owner shall receive a copy of the life safety building systems document prior to issuance of the building permit.

12.4.1.4.2 Life Safety Narrative. A life safety narrative shall be provided describing the following:

(1) Building occupancy, construction type, and intended uses and events

(2) Building area and population capacity of the proposed facility

(3) Principal fire and life safety features/strategies for the building, including–as applicable–the following:

(a) Egress

(b) Access control

(c) Fire barriers, smoke barriers, and smoke partitions

(d) Fire suppression systems

(e) Smoke control/protection

(f) Fire detection and alarm

(g) PA system

(h) Emergency elevator operation

(i) Emergency power and lighting

(j) Provisions for patrons with disabilities

(k) Fire department access

(l) Fire/Emergency command center

(4) Exterior construction design parameters used/applied

12.4.1.4.3 Life Safety Floor Plans. Life safety floor plans of each level shall be provided–as applicable–with the following:

(1) Occupant load, exit location, egress capacity, main entrance/exit, horizontal exits, travel distance, and exit discharge

(2) Fire barriers, smoke barriers, and smoke partitions

(3) Areas of smoke-protected assembly occupancy

(4) Separate smoke-protected areas or zones

(5) Areas of other occupancy type and separations

(6) Unprotected vertical openings

(7) Event plans for each anticipated type of event depicting the following:

(a) Seating configuration

(b) Exhibit booth layout

(c) Stage location

(d) Occupant load, egress capacity required, exits provided, and travel distance

(e) Any floor or stage use restrictions

(f) Plan and/or section drawing indicating areas where the roof construction is more than 50 ft (15 m) above floor level and areas where sprinkler protection is omitted

(g) Areas of refuge — interior and exterior

1 2 . 4 . 1 . 4 . 4 Engineering Analysis and Calculations. An engineering analysis shall be provided with the following:

(1) Smoke protection analysis to substantiate the use of smoke-protected assembly seating as follows:

(a) Performance-based design methods approved by the AHJ

(b) Smoke control requirements per NFPA 92, *Standard for Smoke Control Systems*

(c) Smoke control assumptions, such as fire scenario description, fire size quantification, and smoke development/smoke movement analysis

(d) Proposed testing protocol for smoke control system and pass/fail criteria

(e) Timed egress analysis and assumed flow rates and travel speeds

(2) Sprinkler protection calculations, including an engineering analysis substantiating locations in accordance with 12.3.5.3 where sprinkler protection would be ineffective due to height and combustible loading

(3) Load diagram of rigging/load capacity of gridiron, fly loft, or long-span roof structure used for hanging overhead objects

12.4.1.5 Life Safety Management Document. The AHJ shall be provided with a life safety management document providing the information required in 12.4.1.5.2 through 12.4.1.5.7.

12.4.1.5.1 Document Distribution. The persons performing the life safety evaluation, the AHJ, the A/E design team, and the building owner shall receive a copy of the life safety management document prior to issuance of the certificate of occupancy.

1 2. 4 .1 .5.2 Facility Management and Operational Plans. Facility management and operational plans shall address the following:

(1) Best practices adopted or recognized

(2) Emergency plans

(3) Evacuation plans

(4) Shelter-in-place plans, including capacities and protection considerations

(5) Crowd management training plan

(6) Safety plans, which include the following:

(a) Training plans

(b) Safety equipment plans

(7) Fire alarm, smoke control system protocol, and testing plans

(8) First aid or medical treatment plans, which include the following:

(a) Defined levels of service

(b) Standing orders adopted

(c) Supply and equipment plan

(9) Housekeeping plans — biological, medical, hazardous materials cleaning

(10) Emergency communication plans, which include the following:

(a) Chain of authority and incident command system employed

(b) Contact information for the following:

i. Venue personnel

ii. Emergency management and response organizations, such as fire, police, medical, utility, transportation, and key stakeholders

(c) Communication systems

(d) Standard announcement for incidents or emergency situations

(11) Risk and threat assessment for venue and surrounding area for the following:

(a) Severe weather

(b) Hazardous materials

(c) Terrorism

(d) Hostile intruder

(12) Operating procedures and protocols for risks, such as the following:

(a) Severe weather preparedness and monitoring plans

(b) Hazardous materials incidence response plans

(c) Terrorism response plans

(d) Hostile intruder response plans

(13) First responder response/arrival routes plans

(14) Alcohol management plans

(15) Food safety plans

(16) Rigging and temporary performance structure, which includes the following:

(a) Design and safety review plans

(b) Emergency action plans

(17) Chemical and hazardous materials information and data

(18) Barrier and wall protection plans for motor sports or similar events

12.4.1.5.3 Records. Records of the facility management plans, including procedures and location, shall be maintained for the following:

(1) Crowd management training

(2) Safety training

(3) Fire alarm, smoke control system maintenance, and test records

(4) First aid or medical treatment and regulation compliance

12.4.1.5.4 Building Systems Reference Guide. A building systems reference guide shall be provided in accordance with 12.4.1.5.4.1 through 12.4.1.5.4.3.

12.4.1.5.4.1 A basic life safety building systems reference guide shall be developed and maintained.

12.4.1.5.4.2 The life safety building systems reference guide shall contain the important and key information for the venue management's use when planning events/activities for the safety of patrons, performers/participants, employees, and vendors.

12.4.1.5.4.3 The life safety building systems document in accordance with 12.4.1.4 shall be permitted to be used, and additionally the life safety building systems reference guide shall include the following:

(1) Occupant capacity of every space/room

(2) Egress flow diagrams, including assumed flow rates, and capacities of all aisles and hallways, including public and nonpublic areas

(3) Capacities of all exterior doors and/or choke points in immediate perimeter areas

(4) Limitations or assumptions for ingress control that could be in place during an emergency egress/evacuation, including control gates, queuing barriers, and turnstiles

(5) Capacities of immediate perimeter exterior walkways, including assumed flow rates for exterior areas

(6) Assumed egress paths for normal conditions — transportation modes

(7) Management level sequencing charts for alarm and emergency communication systems, the manual, or override options/instructions that include the following:

(a) List of codes or alarm signals

(b) Location of manual overrides

(c) Description of sequence of operations during an alarm such as exhaust fans operate or doors open

(8) Principal fire and life safety features/strategies, such as sprinklers, smoke control, fire alarm notifications, PA system, emergency power, and fire department access

(9) Assumptions when developing occupancy plans for venue floor, open areas, and nonevent spaces, such as the following:

(a) Event floor plans/setup diagrams for each typical event/activity

(b) Fire sprinkler and smoke protection capabilities

(10) Severe weather shelter areas, locations, structure considerations (limitations), capacities (occupancy and density factor) (11) Command center, which includes the following:

(a) Location (formal or informal)

(b) Structural integrity considerations

(c) Redundant locations and/or capabilities

(d) Jurisdictional rights — assumed and/or applied

(12) Locations and capacities of wheelchair and mobility-impaired seating

(13) Locations and capacities of areas of refuge and other safe areas

(14) Rigging or structural load capacities of grids, truss structure, fly lofts, ceilings, floors, ramps, and staging (15) List of locations of emergency equipment such as fire extinguishers, fire hose cabinets, fire hydrants, AEDs (16) Sequencing of electrical service, such as the following:

(a) Emergency generators and charts of all areas illuminated during power outages

(b) Multiple electrical feed capabilities

(17) List of mechanical, moveable equipment in the facility

(18) Potential hazards in the surrounding neighborhood, including train tracks and propane stations

(19) Assumptions or accommodations considered and used in design

1 2 . 4 . 1 .5.5 The facility management plans shall be maintained and adjusted as necessary for changes to the venue structure, operating purposes and style, and event occupancy.

1 2 . 4 . 1 .5.6 Facility management and operational plans shall be submitted to the AHJ annually.

1 2 . 4 . 1 .5.7 For events and activities at the venue that are outside the normal operating conditions or vary from the normal facility management plans, the following shall apply:

(1) Facility management shall perform an event/activity-specific facility management plan for the AHJ to review.

(2) Approval of the AHJ for the specific facility management plan shall occur prior to such event.

2. No further change to advisory annex text A.12.4.1.1 and A.12.4.1.3

3 . Revise 13.4.1, from what was done by Second Revision SR-96 (Annual 2014 revision cycle – NFPA 101 Second Draft), to read as follows:

13.4.1 Life Safety Evaluation.

13.4.1.1* General. Where a life safety evaluation is required by other provisions of this *Code*, it shall comply with the following:

(1) The life safety evaluation shall be performed by persons acceptable to the AHJ.

(2) The life safety evaluation shall include a written assessment of safety measures for conditions listed in 13.4.1.2 and of the building systems and facility management in accordance with 13.4.1.3.

(3) The life safety evaluation shall be approved annually by the AHJ and shall be updated for special or unusual conditions in

accordance with the provisions of 13.4.1 for existing assembly occupancies.

13.4.1.2 Conditions to Be Assessed. Life safety evaluations shall include an assessment of all of the following conditions and related appropriate safety measures:

(1) Nature of the events and the participants and attendees

(2) Access and egress movement, including crowd density problems

(3) Medical emergencies

(4) Fire hazards

(5) Permanent and temporary structural systems

(6) Severe weather conditions

(7) Earthquakes

(8) Civil or other disturbances

(9) Hazardous materials incidents within and near the facility

(10) Relationships among facility management, event participants, emergency response agencies, and others having a role in the events accommodated in the facility

13.4.1.3* Building Systems and Facility Management Assessments. Life safety evaluations shall include assessments of both building systems and facility management upon which reliance is placed for the safety of facility occupants, and such assessments shall consider scenarios appropriate to the facility.

13.4.1.3.1 Building Systems. Documentation of the building systems in accordance with 13.4.1.4 shall be provided upon request of the AHJ.

1 3 .4.1.3.2 Facility Management. Facility management shall provide the AHJ with facility management documentation in accordance with 13.4.1.5 upon request of the AHJ.

13.4.1.3.3 Life Safety Evaluation. The life safety evaluation shall confirm that the building systems and the facility management and operational plans provide appropriate safety measures.

13.4.1.4 Life Safety Building Systems Document. The AHJ shall be provided with a life safety building systems document providing the information required in 13.4.1.4.2 through 13.4.1.4.4.

13.4.1.4.1 (Reserved.)

13.4.1.4.2 Life Safety Narrative. A life safety narrative shall be provided describing the following:

(1) Building occupancy, construction type, and intended uses and events

(2) Building area and population capacity of the proposed facility

(3) Principal fire and life safety features/strategies for the building, including–as applicable–the following:

(a) Egress

(b) Access Control

(c) Fire barriers, smoke barriers, and smoke partitions

(d) Fire suppression systems (e) Smoke control/protection (f) Fire detection and alarm (g) PA system

(h) Emergency elevator operation

(i) Emergency power and lighting

(j) Provisions for patrons with disabilities

(k) Fire department access

(l) Fire/Emergency command center

(4) Exterior construction design parameters used/applied

13.4.1.4.3 Life Safety Floor Plans. Life safety floor plans of each level shall be provided–as applicable–with the following:

(1) Occupant load, exit location, egress capacity, main entrance/exit, horizontal exits, travel distance, and exit discharge

(2) Fire barriers, smoke barriers, and smoke partitions

(3) Areas of smoke-protected assembly occupancy

(4) Separate smoke-protected areas or zones

(5) Areas of other occupancy type and separations

(6) Unprotected vertical openings

(7) Event plans for each anticipated type of event depicting the following:

(a) Seating configuration

(b) Exhibit booth layout

(c) Stage location

(d) Occupant load, egress capacity required, exits provided, and travel distance

(e) Any floor or stage use restrictions

(f) Plan and/or section drawing indicating areas where the roof construction is more than 50 ft (15 m) above floor level and areas where sprinkler protection is omitted

(g) Areas of refuge — interior and exterior

1 3 . 4 . 1 . 4 .4 Engineering Analysis and Calculations. An engineering analysis shall be provided with the following:

(1) Smoke protection analysis to substantiate the use of smoke-protected assembly seating as follows:

(a) Performance-based design methods approved by the AHJ

(b) Smoke control requirements per NFPA 92, *Standard for Smoke Control Systems*

(c) Smoke control assumptions, such as fire scenario description, fire size quantification, and smoke development/smoke movement analysis

(d) Proposed testing protocol for smoke control system and pass/fail criteria

(e) Timed egress analysis and assumed flow rates and travel speeds

(2) Sprinkler protection calculations, including an engineering analysis substantiating locations in accordance with 13.3.5.3 where sprinkler protection would be ineffective due to height and combustible loading

(3) Load diagram of rigging/load capacity of gridiron, fly loft, or long-span roof structure used for hanging overhead objects

13.4.1.5 Life Safety Management Document. The AHJ shall be provided with a life safety management document providing the information required in 13.4.1.5.2 through 13.4.1.5.7.

13.4.1.5.1 (Reserved.)

1 3. 4 .1 .5.2 Facility Management and Operational Plans. Facility management and operational plans shall address the following:

(1) Best practices adopted or recognized

(2) Emergency plans

(3) Evacuation plans

(4) Shelter-in-place plans including capacities and protection considerations

(5) Crowd management training plans

(6) Safety plans, which include the following: (a) Training plans

(b) Safety equipment plans

(7) Fire alarm, smoke control system protocol, and testing plans

(8) First aid or medical treatment plans, which include the following: (a) Defined levels of service

(b) Standing orders adopted

(c) Supply and equipment plan

(9) Housekeeping plans — biological, medical, hazardous materials cleaning

(10) Emergency communication plans, which include the following:

(a) Chain of authority and incident command system employed

(b) Contact information for the following: i. Venue personnel

ii. Emergency management and response organizations, such as fire, police, medical, utility, transportation, and key stakeholders

(c) Communication systems

(d) Standard announcement for incidents or emergency situations

(11) Risk and threat assessment for venue and surrounding area for the following: (a) Severe weather

(b) Hazardous materials

(c) Terrorism

(d) Hostile intruder

(12) Operating procedures and protocols for risks, such as the following:

(a) Severe weather preparedness and monitoring plans

(b) Hazardous materials incidence response plans

(c) Terrorism response plans

(d) Hostile intruder response plans

(13) First responder response/arrival routes plans

(14) Alcohol management plans

(15) Food safety plans

(16) Rigging and temporary performance structure, which includes the following:

(a) Design and safety review plans

(b) Emergency action plans

(17) Chemical and hazardous materials information and data

(18) Barrier and wall protection plans for motor sports or similar events

13.4.1.5.3 Records. Records of the facility management plans, including procedures and location, shall be maintained for the following:

(1) Crowd management training

(2) Safety training

(3) Fire alarm, smoke control system maintenance, and test records

(4) First aid or medical treatment and regulation compliance

13.4.1.5.4 Building Systems Reference Guide. A building systems reference guide shall be provided in accordance with 13.4.1.5.4.1 through 13.4.1.5.4.3.

13.4.1.5.4.1 A basic life safety building systems reference guide shall be developed and maintained.

13.4.1.5.4.2 The life safety building systems reference guide shall contain the important and key information for the venue management's use when planning events/activities for the safety of patrons, performers/participants, employees, and vendors.

13.4.1.5.4.3 The life safety building systems document in accordance with 13.4.1.4 shall be permitted to be used, and additionally the life safety building systems reference guide shall include the following:

(1) Occupant capacity of every space/room

(2) Egress flow diagrams, including assumed flow rates, and capacities of all aisles and hallways, including public and nonpublic areas

(3) Capacities of all exterior doors and/or choke points in immediate perimeter areas

(4) Limitations or assumptions for ingress control that could be in place during an emergency egress/evacuation, including control gates, queuing barriers, and turnstiles

(5) Capacities of immediate perimeter exterior walkways, including assumed flow rates for exterior areas

(6) Assumed egress paths for normal conditions — transportation modes

(7) Management level sequencing charts for alarm and emergency communication systems, the manual, or override options/instructions that include the following:

(a) List of codes or alarm signals

(b) Location of manual overrides

(c) Description of sequence of operations during an alarm such as exhaust fans operate or doors open

(8) Principal fire and life safety features/strategies, such as sprinklers, smoke control, fire alarm notifications, PA system, emergency power, and fire department access

(9) Assumptions when developing occupancy plans for venue floor, open areas, and nonevent spaces

(a) Event floor plans/setup diagrams for each typical event/activity

(b) Fire sprinkler and smoke protection capabilities

(10) Severe weather shelter areas, locations, structure considerations (limitations), capacities (occupancy and density factor) (11) Command center, which includes the following:

(a) Location (formal or informal)

(b) Structural integrity considerations

(c) Redundant locations and/or capabilities

(d) Jurisdictional rights — assumed and/or applied

(12) Locations and capacities of wheelchair and mobility-impaired seating

(13) Locations and capacities of “areas of refuge and other safe areas

(14) Rigging or structural load capacities of grids, truss structure, fly lofts, ceilings, floors, ramps, and staging

(15) List of locations of emergency equipment such as fire extinguishers, fire hose cabinets, fire hydrants, AEDs

(16) Sequencing of electrical service, such as the following:

(a) Emergency generators and charts of all areas illuminated during power outages

(b) Multiple electrical feed capabilities

(17) List of mechanical, moveable equipment in the facility

(18) Potential hazards in the surrounding neighborhood, including train tracks and propane stations

(19) Assumptions or accommodations considered and used in design

13.4.1.5.5 The facility management plans shall be maintained and adjusted as necessary for changes to the venue structure, operating purposes and style, and event occupancy.

13.4.1.5.6 Facility management and operational plans shall be submitted to the AHJ annually.

13.4.1.5.7 For events and activities at the venue that are outside the normal operating conditions or vary from the normal facility management plans, the following shall apply:

(1) Facility management shall perform an event/activity-specific facility management plan for the AHJ to review. (2) Approval of the AHJ for the specific facility management plan shall occur prior to such event.

4. No further change to advisory annex text A.13.4.1.1 and A.13.4.1.3

Additional Proposed Changes

File Name	Description	Approved
TIA_101-15-3_-_TIA_101-15-3.pdf	NFPA TIA 15-3 Log. No. 1130	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originate from Tentative Interim Amendment No. 15-3 (Log 1130) issued by the Standards Council on August 14, 2014 and per the NFPA Regs., needs to be reconsidered by the Technical Committee for the next edition of the Document."

Submitter’s Substantiation: This TIA is submitted at the recommendation of the Correlating Committee on Safety Life which reviewed technical changes being made to the Life Safety Evaluation provisions related to designer and owner responsibilities (NFPA 101 12.4.1 and 13.4.1) by the Assembly Occupancies Technical via the Second Draft for the 2015 Annual Meeting. The Correlating Committee

is in agreement with the technical committee chair that revision is desirable to avoid potential for incorrect and inconsistent enforcement. The processing of the TIA is intended to provide the Standards Council with the materials it will need to blend the changes from the TIA with the code text developed by the committee for issuance as part of the 2015 edition of NFPA 101 – something the Council will address at its August 2014 meeting. Substantiation for the proposed corrections follows.

1. NFPA 101 12.4.1.4.2 / 13.4.1.4.2 Life Safety Narrative. The Second Draft omits the following requirements for the Life Safety Narrative: egress; access control; fire barriers, smoke barriers, and smoke partitions; fire detection; and emergency elevator operation. These features are critical to the overall safety of the occupants. Without specific explanation, designers and enforcers may incorrectly assume that these items where purposefully omitted, which will lead to incomplete, incorrect, and potentially unsafe designs. This TIA corrects these omissions.

2. NFPA 101 12.4.1.4.4 / 13.4.1.4.4 Engineering Analysis and Calculations. The Second Draft requires smoke control designs to meet NFPA 92 – Standard for Smoke Control Systems, and also requires the design to provide the following: smoke maintained at a level 6 ft above the floor of the means of egress. This new requirement will explicitly prohibit all smoke below 6 ft, whether tenable or not, and whether occupants have evacuated or not. This poses two issues.
Issue A. This is in direct conflict with long standing methods for evaluating performance criteria outlined within NFPA 101 A.5.2.2. More specifically, this conflicts with Methods 1 and 2.
- Method 1 allows occupants to evacuate through smoke where tenable conditions are maintained.
- Method 2 allows smoke to bank down within areas where occupants are expected to have previously evacuated, such as an upper level balcony in a large open space.

Both Methods allow smoke to descend below 6 ft above the floor of the means of egress, and are considered safe by NFPA 101.

To be clear, Life Safety Evaluations are intended to follow guidance from NFPA 101 Chapter 5. The text of A.12.4.1.1 / A.13.4.1.1 states in part the following.
Life safety evaluations are examples of performance-based approaches to life safety. In this respect, significant guidance in the form and process of life safety evaluations is provided by Chapter 5, keeping in mind the fire safety emphasis in Chapter 5.

The 6 ft requirement is in direct conflict with Chapter 5. This TIA resolves this conflict.
Issue B. The second issue involves practical design implications with the 6 ft requirement, as this puts an undue burden upon designs using Computational Fluid Dynamics (CFD) simulation to substantiate tenability. In many cases, these simulations are necessary and prudent to appropriately account for smoke movement in geometrically complex spaces. In addition, the enhanced detail provided in less complex spaces allows for better informed design.

Consider the following, NFPA 92 Figure A.3.3.13.1 notes that the Smoke Layer Interface is above the First Indication of Smoke. Since equations within NFPA 92 specifically calculate the Smoke Layer Interface, smoke is clearly expected to be present below the NFPA 92 calculated smoke layer. Smoke below the calculated Smoke Layer Interface is neglected for Equations within NFPA 92.

(See figure in attached NFPA 101 TIA 15-3 Ballot)

CFD simulations provide better resolution of the smoke layer properties, and predict the Transition Zone with relatively good accuracy. When CFD methods are required to limit all smoke below the 6 ft zone (6 ft above the floor of the means of egress), the simulations must use the First Indication of Smoke as criteria, rather than the Smoke Layer Interface. Thus, these CFD simulations would require more smoke exhaust and would maintain the Smoke Layer Interface at a greater distance above the floor than required by NFPA 92 equations. This TIA resolves this conflict.

3. Example Inconsistencies NFPA 101 12.4.1.3.3.3 / 13.4.1.3.3.3. Other changes within the TIA are proposed to avoid inconsistencies within NFPA 101. For example, NFPA 101 12.4.1.3.3.3 / 13.4.1.3.3.3 in the proposed draft requires the following.
The AHJ shall determine acceptable persons performing the life safety evaluation in a timely manner to enable the design team and facility management to resolve concerns to the satisfaction of the persons performing the life safety evaluation prior to their submission.

The draft language requires the AHJ to determine the acceptable persons. This infers selection and thus places an undue burden on the AHJ. This also takes selection ability and responsibility away from the owner and designer team. The TIA amends the text from determine to approve to be consistent with other portions of NFPA 101.

Emergency Nature: In accordance with the Regulation Governing the Development of NFPA Standards, clause 5.3(a), the proposed TIA intends to correct an error or an omission that was overlooked during a regular revision process.
The changes for the 2015 draft were meant to clarify the responsibilities and the level of detail for Life Safety Analysis. As stated in the above substantiation, the text proposed by the committee includes incorrect and inconsistent provisions. These changes are necessary: (1) to avoid undue burden on the AHJ; (2) to avoid potentially unsafe designs; and (3) to avoid inherent inconsistencies in the 2015 edition of NFPA 101.

Submitter Information Verification

Submitter Full Name: TC ON SAF-AXM
Organization: NFPA TC on Assembly Occupancies
Street Address:
City:
State:
Zip:
Submittal Date: Mon Mar 09 09:10:20 EDT 2015

Tentative Interim Amendment

NFPA 101®

Life Safety Code®

2015 Edition

Reference: 12.4.1, 13.4.1, A.12.4.1, and A.13.4.1
TIA 15-3
(SC 14-8-24 / TIA Log #1130)

Note: Text of the TIA issued and incorporated into the text of the document, therefore no separate publication is necessary.

1. Revise 12.4.1, from what was done by Second Revision SR-95 (Annual 2014 revision cycle – NFPA 101 Second Draft), to read as follows:

12.4.1 Life Safety Evaluation.
12.4.1.1* General. Where a life safety evaluation is required by other provisions of this *Code*, it shall comply with the following:
(1) The life safety evaluation shall be performed by persons acceptable to the AHJ.
(2) The life safety evaluation shall include a written assessment of safety measures for conditions listed in 12.4.1.2 and of the building systems and facility management in accordance with 12.4.1.3.
(3) The life safety evaluation shall be approved annually by the AHJ and shall be updated for special or unusual conditions in accordance with the provisions of 13.4.1 for existing assembly occupancies.
12.4.1.2 Conditions to Be Assessed. Life safety evaluations shall include an assessment of all of the following conditions and related appropriate safety measures:
(1) Nature of the events and the participants and attendees
(2) Access and egress movement, including crowd density problems
(3) Medical emergencies
(4) Fire hazards
(5) Permanent and temporary structural systems
(6) Severe weather conditions
(7) Earthquakes
(8) Civil or other disturbances
(9) Hazardous materials incidents within and near the facility
(10) Relationships among facility management, event participants, emergency response agencies, and others having a role in the events accommodated in the facility
12.4.1.3* Building Systems and Facility Management Assessments. Life safety evaluations shall include assessments of both building systems and facility management upon which reliance is placed for the safety of facility occupants, and such assessments shall consider scenarios appropriate to the facility.
12.4.1.3.1 Building Systems. Prior to issuance of the building permit, the design team shall provide the AHJ with building systems documentation in accordance with 12.4.1.4.
12.4.1.3.2 Facility Management. Prior to issuance of the certificate of occupancy, the facility management shall provide the AHJ with facility management documentation in accordance with 12.4.1.5.

(**Note: For further information on NFPA Codes and Standards, please see** www.nfpa.org/codelist)
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12.4.1.3.3 Life Safety Evaluation.
12.4.1.3.3.1 Prior to issuance of the building permit, the persons performing the life safety evaluation shall confirm that the building systems provide appropriate safety measures.
12.4.1.3.3.2 Prior to issuance of the certificate of occupancy, the persons performing the life safety evaluation shall confirm that the facility management and operational plans provide appropriate safety measures.
12.4.1.3.3.3 The AHJ shall approve the acceptable persons performing the life safety evaluation in a timely manner to enable the design team and facility management to resolve concerns to the satisfaction of the persons performing the life safety evaluation prior to their submission.
12.4.1.4 Life Safety Building Systems Document. The AHJ shall be provided with a life safety building systems document providing the information required in 12.4.1.4.2 through 12.4.1.4.4.
12.4.1.4.1 Document Distribution. The persons performing the life safety evaluation, the AHJ, the A/E design team, and the building owner shall receive a copy of the life safety building systems document prior to issuance of the building permit.
12.4.1.4.2 Life Safety Narrative. A life safety narrative shall be provided describing the following:
(1) Building occupancy, construction type, and intended uses and events
(2) Building area and population capacity of the proposed facility
(3) Principal fire and life safety features/strategies for the building, including–as applicable–the following:
(a) Egress
(b) Access control
(c) Fire barriers, smoke barriers, and smoke partitions
(d) Fire suppression systems
(e) Smoke control/protection
(f) Fire detection and alarm
(g) PA system
(h) Emergency elevator operation
(i) Emergency power and lighting
(j) Provisions for patrons with disabilities
(k) Fire department access
(l) Fire/Emergency command center
(4) Exterior construction design parameters used/applied
12.4.1.4.3 Life Safety Floor Plans. Life safety floor plans of each level shall be provided–as applicable–with the following:
(1) Occupant load, exit location, egress capacity, main entrance/exit, horizontal exits, travel distance, and exit discharge
(2) Fire barriers, smoke barriers, and smoke partitions
(3) Areas of smoke-protected assembly occupancy
(4) Separate smoke-protected areas or zones
(5) Areas of other occupancy type and separations
(6) Unprotected vertical openings
(7) Event plans for each anticipated type of event depicting the following:
(a) Seating configuration
(b) Exhibit booth layout
(c) Stage location
(d) Occupant load, egress capacity required, exits provided, and travel distance
(e) Any floor or stage use restrictions
(f) Plan and/or section drawing indicating areas where the roof construction is more than 50 ft (15 m) above floor level and areas where sprinkler protection is omitted
(g) Areas of refuge — interior and exterior
12.4.1.4.4 Engineering Analysis and Calculations. An engineering analysis shall be provided with the following:
(1) Smoke protection analysis to substantiate the use of smoke-protected assembly seating as follows:
(a) Performance-based design methods approved by the AHJ
(b) Smoke control requirements per NFPA 92, *Standard for Smoke Control Systems*
(c) Smoke control assumptions, such as fire scenario description, fire size quantification, and smoke development/smoke movement analysis
(d) Proposed testing protocol for smoke control system and pass/fail criteria
(e) Timed egress analysis and assumed flow rates and travel speeds
(2) Sprinkler protection calculations, including an engineering analysis substantiating locations in accordance with 12.3.5.3 where sprinkler protection would be ineffective due to height and combustible loading
(3) Load diagram of rigging/load capacity of gridiron, fly loft, or long-span roof structure used for hanging overhead objects
12.4.1.5 Life Safety Management Document. The AHJ shall be provided with a life safety management document providing the information required in 12.4.1.5.2 through 12.4.1.5.7.

(**Note: For further information on NFPA Codes and Standards, please see** www.nfpa.org/codelist)
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NATIONAL FIRE PROTECTION ASSOCIATION

12.4.1.5.1 Document Distribution. The persons performing the life safety evaluation, the AHJ, the A/E design team, and the building owner shall receive a copy of the life safety management document prior to issuance of the certificate of occupancy.

12.4.1.5.2 Facility Management and Operational Plans. Facility management and operational plans shall address the following:

(1) Best practices adopted or recognized
(2) Emergency plans
(3) Evacuation plans
(4) Shelter-in-place plans, including capacities and protection considerations
(5) Crowd management training plan
(6) Safety plans, which include the following:
  (a) Training plans
  (b) Safety equipment plans
(7) Fire alarm, smoke control system protocol, and testing plans
(8) First aid or medical treatment plans, which include the following:
  (a) Defined levels of service
  (b) Standing orders adopted
  (c) Supply and equipment plan
(9) Housekeeping plans — biological, medical, hazardous materials cleaning
(10) Emergency communication plans, which include the following:
  (a) Chain of authority and incident command system employed
  (b) Contact information for the following:
    i. Venue personnel
    ii. Emergency management and response organizations, such as fire, police, medical, utility, transportation, and key stakeholders
  (c) Communication systems
  (d) Standard announcement for incidents or emergency situations
(11) Risk and threat assessment for venue and surrounding area for the following:
  (a) Severe weather
  (b) Hazardous materials
  (c) Terrorism
  (d) Hostile intruder
(12) Operating procedures and protocols for risks, such as the following:
  (a) Severe weather preparedness and monitoring plans
  (b) Hazardous materials incidence response plans
  (c) Terrorism response plans
  (d) Hostile intruder response plans
(13) First responder response/arrival routes plans
(14) Alcohol management plans
(15) Food safety plans
(16) Rigging and temporary performance structure, which includes the following:
  (a) Design and safety review plans
  (b) Emergency action plans
(17) Chemical and hazardous materials information and data
(18) Barrier and wall protection plans for motor sports or similar events

12.4.1.5.3 Records. Records of the facility management plans, including procedures and location, shall be maintained for the following:

(1) Crowd management training
(2) Safety training
(3) Fire alarm, smoke control system maintenance, and test records
(4) First aid or medical treatment and regulation compliance

12.4.1.5.4 Building Systems Reference Guide. A building systems reference guide shall be provided in accordance with 12.4.1.5.4.1 through 12.4.1.5.4.3.

12.4.1.5.4.1 A basic life safety building systems reference guide shall be developed and maintained.

12.4.1.5.4.2 The life safety building systems reference guide shall contain the important and key information for the venue management's use when planning events/activities for the safety of patrons, performers/participants, employees, and vendors.

(**Note: For further information on NFPA Codes and Standards, please see** www.nfpa.org/codelist)
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12.4.1.5.4.3 The life safety building systems document in accordance with 12.4.1.4 shall be permitted to be used, and additionally the life safety building systems reference guide shall include the following:

(1) Occupant capacity of every space/room
(2) Egress flow diagrams, including assumed flow rates, and capacities of all aisles and hallways, including public and nonpublic areas
(3) Capacities of all exterior doors and/or choke points in immediate perimeter areas
(4) Limitations or assumptions for ingress control that could be in place during an emergency egress/evacuation, including control gates, queuing barriers, and turnstiles
(5) Capacities of immediate perimeter exterior walkways, including assumed flow rates for exterior areas
(6) Assumed egress paths for normal conditions — transportation modes
(7) Management level sequencing charts for alarm and emergency communication systems, the manual, or override options/instructions that include the following:
    (a) List of codes or alarm signals
    (b) Location of manual overrides
    (c) Description of sequence of operations during an alarm such as exhaust fans operate or doors open
(8) Principal fire and life safety features/strategies, such as sprinklers, smoke control, fire alarm notifications, PA system, emergency power, and fire department access
(9) Assumptions when developing occupancy plans for venue floor, open areas, and nonevent spaces, such as the following:
    (a) Event floor plans/setup diagrams for each typical event/activity
    (b) Fire sprinkler and smoke protection capabilities
(10) Severe weather shelter areas, locations, structure considerations (limitations), capacities (occupancy and density factor)
(11) Command center, which includes the following:
    (a) Location (formal or informal)
    (b) Structural integrity considerations
    (c) Redundant locations and/or capabilities
    (d) Jurisdictional rights — assumed and/or applied
(12) Locations and capacities of wheelchair and mobility-impaired seating
(13) Locations and capacities of areas of refuge and other safe areas
(14) Rigging or structural load capacities of grids, truss structure, fly lofts, ceilings, floors, ramps, and staging
(15) List of locations of emergency equipment such as fire extinguishers, fire hose cabinets, fire hydrants, AEDs
(16) Sequencing of electrical service, such as the following:
    (a) Emergency generators and charts of all areas illuminated during power outages
    (b) Multiple electrical feed capabilities
(17) List of mechanical, moveable equipment in the facility
(18) Potential hazards in the surrounding neighborhood, including train tracks and propane stations
(19) Assumptions or accommodations considered and used in design

12.4.1.5.5 The facility management plans shall be maintained and adjusted as necessary for changes to the venue structure, operating purposes and style, and event occupancy.

12.4.1.5.6 Facility management and operational plans shall be submitted to the AHJ annually.

12.4.1.5.7 For events and activities at the venue that are outside the normal operating conditions or vary from the normal facility management plans, the following shall apply:

(1) Facility management shall perform an event/activity-specific facility management plan for the AHJ to review.
(2) Approval of the AHJ for the specific facility management plan shall occur prior to such event.

2. No further change to advisory annex text A.12.4.1.1 and A.12.4.1.3

3. Revise 13.4.1, from what was done by Second Revision SR-96 (Annual 2014 revision cycle – NFPA 101 Second Draft), to read as follows:

13.4.1 Life Safety Evaluation.

13.4.1.1* General. Where a life safety evaluation is required by other provisions of this *Code*, it shall comply with the following:

(1) The life safety evaluation shall be performed by persons acceptable to the AHJ.
(2) The life safety evaluation shall include a written assessment of safety measures for conditions listed in 13.4.1.2 and of the building systems and facility management in accordance with 13.4.1.3.
(3) The life safety evaluation shall be approved annually by the AHJ and shall be updated for special or unusual conditions in accordance with the provisions of 13.4.1 for existing assembly occupancies.

13.4.1.2 Conditions to Be Assessed. Life safety evaluations shall include an assessment of all of the following conditions and related appropriate safety measures:

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(1) Nature of the events and the participants and attendees
(2) Access and egress movement, including crowd density problems
(3) Medical emergencies
(4) Fire hazards
(5) Permanent and temporary structural systems
(6) Severe weather conditions
(7) Earthquakes
(8) Civil or other disturbances
(9) Hazardous materials incidents within and near the facility
(10) Relationships among facility management, event participants, emergency response agencies, and others having a role in the events accommodated in the facility

13.4.1.3* Building Systems and Facility Management Assessments. Life safety evaluations shall include assessments of both building systems and facility management upon which reliance is placed for the safety of facility occupants, and such assessments shall consider scenarios appropriate to the facility.

13.4.1.3.1 Building Systems. Documentation of the building systems in accordance with 13.4.1.4 shall be provided upon request of the AHJ.

13.4.1.3.2 Facility Management. Facility management shall provide the AHJ with facility management documentation in accordance with 13.4.1.5 upon request of the AHJ.

13.4.1.3.3 Life Safety Evaluation. The life safety evaluation shall confirm that the building systems and the facility management and operational plans provide appropriate safety measures.

13.4.1.4 Life Safety Building Systems Document. The AHJ shall be provided with a life safety building systems document providing the information required in 13.4.1.4.2 through 13.4.1.4.4.

13.4.1.4.1 (Reserved.)

13.4.1.4.2 Life Safety Narrative. A life safety narrative shall be provided describing the following:
(1) Building occupancy, construction type, and intended uses and events
(2) Building area and population capacity of the proposed facility
(3) Principal fire and life safety features/strategies for the building, including–as applicable–the following:
(a) Egress
(b) Access Control
(c) Fire barriers, smoke barriers, and smoke partitions
(d) Fire suppression systems
(e) Smoke control/protection
(f) Fire detection and alarm
(g) PA system
(h) Emergency elevator operation
(i) Emergency power and lighting
(j) Provisions for patrons with disabilities
(k) Fire department access
(l) Fire/Emergency command center
(4) Exterior construction design parameters used/applied

13.4.1.4.3 Life Safety Floor Plans. Life safety floor plans of each level shall be provided–as applicable–with the following:
(1) Occupant load, exit location, egress capacity, main entrance/exit, horizontal exits, travel distance, and exit discharge
(2) Fire barriers, smoke barriers, and smoke partitions
(3) Areas of smoke-protected assembly occupancy
(4) Separate smoke-protected areas or zones
(5) Areas of other occupancy type and separations
(6) Unprotected vertical openings (7) Event plans for each anticipated type of event depicting the following:
(a) Seating configuration
(b) Exhibit booth layout
(c) Stage location
(d) Occupant load, egress capacity required, exits provided, and travel distance
(e) Any floor or stage use restrictions
(f) Plan and/or section drawing indicating areas where the roof construction is more than 50 ft (15 m) above floor level and areas where sprinkler protection is omitted
(g) Areas of refuge — interior and exterior

13.4.1.4.4 Engineering Analysis and Calculations. An engineering analysis shall be provided with the following:
(1) Smoke protection analysis to substantiate the use of smoke-protected assembly seating as follows:
(a) Performance-based design methods approved by the AHJ
(b) Smoke control requirements per NFPA 92, *Standard for Smoke Control Systems*

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(c) Smoke control assumptions, such as fire scenario description, fire size quantification, and smoke development/smoke movement analysis
(d) Proposed testing protocol for smoke control system and pass/fail criteria
(e) Timed egress analysis and assumed flow rates and travel speeds

(2) Sprinkler protection calculations, including an engineering analysis substantiating locations in accordance with 13.3.5.3 where sprinkler protection would be ineffective due to height and combustible loading
(3) Load diagram of rigging/load capacity of gridiron, fly loft, or long-span roof structure used for hanging overhead objects

13.4.1.5 Life Safety Management Document. The AHJ shall be provided with a life safety management document providing the information required in 13.4.1.5.2 through 13.4.1.5.7.

13.4.1.5.1 (Reserved.)

13.4.1.5.2 Facility Management and Operational Plans. Facility management and operational plans shall address the following:
(1) Best practices adopted or recognized
(2) Emergency plans
(3) Evacuation plans
(4) Shelter-in-place plans including capacities and protection considerations
(5) Crowd management training plans
(6) Safety plans, which include the following:
(a) Training plans
(b) Safety equipment plans
(7) Fire alarm, smoke control system protocol, and testing plans
(8) First aid or medical treatment plans, which include the following:
(a) Defined levels of service
(b) Standing orders adopted
(c) Supply and equipment plan
(9) Housekeeping plans — biological, medical, hazardous materials cleaning
(10) Emergency communication plans, which include the following:
(a) Chain of authority and incident command system employed
(b) Contact information for the following:
i. Venue personnel
ii. Emergency management and response organizations, such as fire, police, medical, utility, transportation, and key stakeholders
(c) Communication systems
(d) Standard announcement for incidents or emergency situations
(11) Risk and threat assessment for venue and surrounding area for the following:
(a) Severe weather
(b) Hazardous materials
(c) Terrorism
(d) Hostile intruder
(12) Operating procedures and protocols for risks, such as the following:
(a) Severe weather preparedness and monitoring plans
(b) Hazardous materials incidence response plans
(c) Terrorism response plans
(d) Hostile intruder response plans
(13) First responder response/arrival routes plans
(14) Alcohol management plans
(15) Food safety plans
(16) Rigging and temporary performance structure, which includes the following:
(a) Design and safety review plans
(b) Emergency action plans
(17) Chemical and hazardous materials information and data
(18) Barrier and wall protection plans for motor sports or similar events

13.4.1.5.3 Records. Records of the facility management plans, including procedures and location, shall be maintained for the following:
(1) Crowd management training
(2) Safety training
(3) Fire alarm, smoke control system maintenance, and test records
(4) First aid or medical treatment and regulation compliance

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13.4.1.5.4 Building Systems Reference Guide. A building systems reference guide shall be provided in accordance with 13.4.1.5.4.1 through 13.4.1.5.4.3.

13.4.1.5.4.1 A basic life safety building systems reference guide shall be developed and maintained.

13.4.1.5.4.2 The life safety building systems reference guide shall contain the important and key information for the venue management's use when planning events/activities for the safety of patrons, performers/participants, employees, and vendors.

13.4.1.5.4.3 The life safety building systems document in accordance with 13.4.1.4 shall be permitted to be used, and additionally the life safety building systems reference guide shall include the following:

(1) Occupant capacity of every space/room

(2) Egress flow diagrams, including assumed flow rates, and capacities of all aisles and hallways, including public and nonpublic areas

(3) Capacities of all exterior doors and/or choke points in immediate perimeter areas

(4) Limitations or assumptions for ingress control that could be in place during an emergency egress/evacuation, including control gates, queuing barriers, and turnstiles

(5) Capacities of immediate perimeter exterior walkways, including assumed flow rates for exterior areas

(6) Assumed egress paths for normal conditions — transportation modes

(7) Management level sequencing charts for alarm and emergency communication systems, the manual, or override options/instructions that include the following:

(a) List of codes or alarm signals

(b) Location of manual overrides

(c) Description of sequence of operations during an alarm such as exhaust fans operate or doors open

(8) Principal fire and life safety features/strategies, such as sprinklers, smoke control, fire alarm notifications, PA system, emergency power, and fire department access

(9) Assumptions when developing occupancy plans for venue floor, open areas, and nonevent spaces

(a) Event floor plans/setup diagrams for each typical event/activity

(b) Fire sprinkler and smoke protection capabilities

(10) Severe weather shelter areas, locations, structure considerations (limitations), capacities (occupancy and density factor)

(11) Command center, which includes the following:

(a) Location (formal or informal)

(b) Structural integrity considerations

(c) Redundant locations and/or capabilities

(d) Jurisdictional rights — assumed and/or applied

(12) Locations and capacities of wheelchair and mobility-impaired seating

(13) Locations and capacities of "areas of refuge and other safe areas

(14) Rigging or structural load capacities of grids, truss structure, fly lofts, ceilings, floors, ramps, and staging

(15) List of locations of emergency equipment such as fire extinguishers, fire hose cabinets, fire hydrants, AEDs

(16) Sequencing of electrical service, such as the following:

(a) Emergency generators and charts of all areas illuminated during power outages

(b) Multiple electrical feed capabilities

(17) List of mechanical, moveable equipment in the facility

(18) Potential hazards in the surrounding neighborhood, including train tracks and propane stations

(19) Assumptions or accommodations considered and used in design

13.4.1.5.5 The facility management plans shall be maintained and adjusted as necessary for changes to the venue structure, operating purposes and style, and event occupancy.

13.4.1.5.6 Facility management and operational plans shall be submitted to the AHJ annually.

13.4.1.5.7 For events and activities at the venue that are outside the normal operating conditions or vary from the normal facility management plans, the following shall apply:

(1) Facility management shall perform an event/activity-specific facility management plan for the AHJ to review.

(2) Approval of the AHJ for the specific facility management plan shall occur prior to such event.

4. No further change to advisory annex text A.13.4.1.1 and A.13.4.1.3

Issue Date: August 14, 2014
Effective Date: September 3, 2014

(**Note: For further information on NFPA Codes and Standards, please see** www.nfpa.org/codelist)
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Public Input No. 94-NFPA 101-2015 [New Section after 1.1.4]

1.1.5 Hazardous Materials Emergencies

The *Code* also addresses other considerations that provide for occupant protection during emergency events involving hazardous materials.

Additional Proposed Changes

File Name	Description	Approved
A.1.1.5.docx	Proposed Annex Section A.1.1.5	

Statement of Problem and Substantiation for Public Input

This Public Input is submitted on behalf of the Hazardous Materials Task Group. The Life Safety Code Correlating Committee appointed the Hazardous Materials Task Group to review hazardous materials provisions within the code and provide a recommendation. This Task Group included representative membership from the Life Safety Code core and occupancy chapters. The Task Group agreed that a gap existed and ultimately recommended additional provisions to more comprehensively address hazardous materials within the Life Safety Code. The agreed set of recommendations include revisions to the following sections: 1.1.5, 4.1.3, 4.2.3, 6.2.2, 7.12, 8.7.3, and new Annex C. The majority of the revisions reference existing NFPA standards, rather than create new technical requirements within the code. Scoping sections for these standards are reproduced within a new Annex C to provide guidance. Proposed Annex Section A.1.1.5 is included for clarity.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 95-NFPA 101-2015 [New Section after 4.1.2]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 96-NFPA 101-2015 [New Section after 4.2.2]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 97-NFPA 101-2015 [Section No. 6.2.2.1]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 98-NFPA 101-2015 [New Section after 7.11.6]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 99-NFPA 101-2015 [Section No. 8.7.3]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 100-NFPA 101-2015 [New Section after B.4]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 95-NFPA 101-2015 [New Section after 4.1.2]	
Public Input No. 96-NFPA 101-2015 [New Section after 4.2.2]	
Public Input No. 97-NFPA 101-2015 [Section No. 6.2.2.1]	
Public Input No. 98-NFPA 101-2015 [New Section after 7.11.6]	

Public Input No. 99-NFPA 101-2015
[Section No. 8.7.3]

Public Input No. 100-NFPA 101-2015
[New Section after B.4]

Submitter Information Verification

Submitter Full Name: JEFFREY TUBBS
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State:
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Submittal Date: Tue May 26 14:26:04 EDT 2015

A.1.1.5 Incidents involving hazardous materials are capable of posing significant life safety challenges in buildings. The Code recognizes this potential and includes technical requirements to address concerns related to hazardous material inventories and associated emergencies.

Public Input No. 379-NFPA 101-2015 [Section No. 1.1.6]

1.1.6 Areas Not Addressed.

The *Code* does not address the following:

(1) * General fire prevention or building construction features that are normally a function of fire prevention codes and building codes

(2) Prevention of injury incurred by an individual due to that individual's failure to use reasonable care

(3) Preservation of property from loss by fire

(4) Buldings used for the retail sale and associated storage of consumer fireworks

Statement of Problem and Substantiation for Public Input

Standards Council Decision #14-1 directed the NFPA Technical Committees to discontinue requirements for the storage and retail sales of consumer fireworks. The Council then directed and subsequently issued a series of TIA's removing any requirements for consumer fireworks from NFPA codes and standards. Unfortunately the TIA's did not accomplish the intent of the Council Decision; but rather, created an unacceptable situation in which consumer fireworks are currently treated as ordinary hazard contents by the various NFPA codes and standards. Instead of not addressing the retail sales of consumer fireworks, NFPA 101 now treats such facilities as a mercantile occupancy with ordinary hazard contents. In order to accomplish the directive issued by the Council, the storage and retail sales of consumer fireworks needs to be specifically excluded from the scope of NFPA 101.

While the APA continues to believe that the Council Decision was based on false and misleading information and that the resulting action is contrary to NFPA's mission of "eliminating death, injury, property and economic loss due to fire, electrical and related hazards", the APA submits the Public Input to correct the errors made in implementing the Council Decision.

Submitter Information Verification

Submitter Full Name: WILLIAM KOFFEL
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Affilliation: American Pyrotechnics Association
Street Address:
City:
State:
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Submittal Date: Mon Jul 06 06:40:34 EDT 2015

Public Input No. 281-NFPA 101-2015 [Section No. 2.2]

2.2* NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 4, *Standard for Integrated Fire Protection and Life Safety System Testing,* 2015 edition.

NFPA 10, *Standard for Portable Fire Extinguishers,* 2013 edition.

NFPA 11, *Standard for Low-, Medium-, and High-Expansion Foam,* 2010 edition.

NFPA 12, *Standard on Carbon Dioxide Extinguishing Systems,* 2011 edition.

NFPA 12A, *Standard on Halon 1301 Fire Extinguishing Systems,* 2009 edition.

NFPA 13, *Standard for the Installation of Sprinkler Systems,* 2013 edition.

NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes,* 2013 edition.

NFPA 13R, *Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies,* 2013 edition.

NFPA 14, *Standard for the Installation of Standpipe and Hose Systems,* 2013 edition.

NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection,* 2012 edition.

NFPA 16, *Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems,* 2011 edition.

NFPA 17, *Standard for Dry Chemical Extinguishing Systems,* 2013 edition.

NFPA 17A, *Standard for Wet Chemical Extinguishing Systems,* 2013 edition.

NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems,* 2014 edition.

NFPA 30, *Flammable and Combustible Liquids Code,* 2015 edition.

NFPA 30B, *Code for the Manufacture and Storage of Aerosol Products,* 2015 edition.

NFPA 31, *Standard for the Installation of Oil-Burning Equipment,* 2011 edition.

NFPA 40, *Standard for the Storage and Handling of Cellulose Nitrate Film,* 2011 edition.

NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals,* 2011 edition.

NFPA 54, *National Fuel Gas Code,* 2015 edition.

NFPA 58, *Liquefied Petroleum Gas Code,* 2014 edition.

NFPA 70®, National Electrical Code®, 2014 edition.

NFPA 72®, National Fire Alarm and Signaling Code, 2013 edition.

NFPA 80, *Standard for Fire Doors and Other Opening Protectives,* 2013 edition.

NFPA 82, *Standard on Incinerators and Waste and Linen Handling Systems and Equipment,* 2014 edition.

NFPA 88A, *Standard for Parking Structures,* 2015 edition.

NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems,* 2015 edition.

NFPA 90B, *Standard for the Installation of Warm Air Heating and Air-Conditioning Systems,* 2015 edition.

NFPA 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids,* 2010 edition.

NFPA 92, *Standard for Smoke Control Systems,* 2012 edition.

NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations,* 2014 edition.

NFPA 99, *Health Care Facilities Code,* 2015 edition.

NFPA 101A, *Guide on Alternative Approaches to Life Safety,* 2013 edition.

NFPA 105, *Standard for Smoke Door Assemblies and Other Opening Protectives,* 2013 edition.

NFPA 110, *Standard for Emergency and Standby Power Systems,* 2013 edition.

NFPA 111, *Standard on Stored Electrical Energy Emergency and Standby Power Systems,* 2013 edition.

NFPA 160, *Standard for the Use of Flame Effects Before an Audience,* 2011 edition.

NFPA 170, *Standard for Fire Safety and Emergency Symbols,* 2012 edition.

NFPA 204, *Standard for Smoke and Heat Venting,*2012 edition.

NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel–Burning Appliances,* 2013 edition.

NFPA 220, *Standard on Types of Building Construction,* 2015 edition.

NFPA 221, *Standard for High Challenge Fire Walls, Fire Walls, and Fire Barrier Walls,* 2015 edition.

NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations,* 2013 edition.

NFPA 252, *Standard Methods of Fire Tests of Door Assemblies,* 2012 edition.

NFPA 253, *Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source,* 2011 edition.

NFPA 257, *Standard on Fire Test for Window and Glass Block Assemblies,* 2012 edition.

NFPA 259, *Standard Test Method for Potential Heat of Building Materials,* 2013 edition.

NFPA 260, *Standard Methods of Tests and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture,* 2013 edition.

NFPA 261, *Standard Method of Test for Determining Resistance of Mock-Up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes,* 2013 edition.

NFPA 265, *Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile or Expanded Vinyl Wall Coverings on Full Height Panels and Walls,* 2011 edition.

NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth,* 2011 edition.

NFPA 288, *Standard Methods of Fire Tests of Horizontal Fire Door Assemblies Installed in Horizontal Fire Resistance–RatedAssemblies,* 2012 edition.

NFPA 289, *Standard Method of Fire Test for Individual Fuel Packages,* 2013 edition.

NFPA 400, *Hazardous Materials Code,* 2013 edition.

NFPA 415, *Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways,* 2013 edition.

NFPA 418, *Standard for Heliports,* 2011 edition.

NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films,* 2010 edition.

NFPA 703, *Standard for Fire Retardant–Treated Wood and Fire-Retardant Coatings for Building Materials,* 2015 edition.

NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment,* 2015 edition.

NFPA 731, *Standard for the Installation of Electronic Premises Security Systems,* 2015 edition.

NFPA 750, *Standard on Water Mist Fire Protection Systems,* 2015 edition.

NFPA 914, *Code for Fire Protection of Historic Structures,* 2010 edition.

NFPA 1126, *Standard for the Use of Pyrotechnics Before a Proximate Audience,* 2011 edition.

NFPA 2001, *Standard on Clean Agent Fire Extinguishing Systems,* 2012 edition.

Statement of Problem and Substantiation for Public Input

I submitted PI 280 to add a new section to 9.6.1.4 requiring integrated testing in accordance with NFPA 4. If that proposal is accepted, NFPA 4 should be added to the list of referenced standards.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 280-NFPA 101-2015 [New Section after 9.6.1.4]	

Submitter Information Verification

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Submittal Date: Thu Jul 02 15:55:47 EDT 2015

Public Input No. 23-NFPA 101-2015 [Section No. 2.3]

2.3 Other Publications.

2.3.1 ACI Publications.

American Concrete Institute, ~~P.O. Box 9094~~ **38800 Country Club Drive** , Farmington Hills, MI ~~48333~~ **48331-3434** . www.concrete.org

ACI 216.1/~~TMS 0216.1~~ , *Code Requirements for Determining Fire Resistance of Concrete and Masonry Construction Assemblies*, ~~2008~~ **2014** .

2.3.2 ANSI Publications.

American National Standards Institute, Inc., 25 West 43rd Street, 4th floor, New York, NY 10036.

ANSI A14.3, **Ladders - Fixed - Safety Requirements** ~~for Fixed Ladders~~ , ~~1992~~ **2008** .

ICC/ANSI A117.1, ~~*American National Standard for*~~ *Accessible and Usable Buildings and Facilities*, 2009.

ANSI/BHMA A156.3**,** *Exit Devices*, ~~2008~~ **2014** .

BHMA/ANSI A156.19, ~~*American National Standard for*~~ *Power Assist and Low Energy Power Operated Doors*, ~~2007~~ **2014** .

~~ANSI Z223.1, *National Fuel Gas Code* , 2006.~~

2.3.3 ASCE Publications.

American Society of Civil Engineers, 1801 Alexander Bell Drive, Reston, VA 20191-4400. www.asce.org

ASCE/**SEI/** SFPE 29, *Standard Calculation Methods for Structural Fire Protection*, 2005.

2.3.4 ASME Publications.

~~American Society of Mechanical Engineers~~ **ASME International** , Two Park Avenue, New York, NY 10016-5990. www.asme.org

ASME A17.1/CSA B44, *Safety Code for Elevators and Escalators*, ~~2007~~ **2013** .

ASME A17.3, *Safety Code for Existing Elevators and Escalators*, ~~2008~~ **2011** .

ASME A17.7/CSA B44.7, *Performance-Based Safety Code for Elevators and Escalators*, 2007**, Reaffirmed 2012** .

2.3.5 ASSE Publications.

American Society of ~~Sanitary Engineering, 901 Canterbury Road, Suite A, Westlake, OH 44145-1480~~ **Safety Engineers, 520 N. Northwest Highway, Park Ridge, IL 60068** .

ANSI /~~ASSE~~ A1264.1, *Safety Requirements for Workplace Walking/Working Surfaces and Their Access; Workplace Floor, Wall and Roof Openings; Stairs and Guardrails Systems*, 2007.

2.3.6 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959. www.astm.org

ASTM ~~C 1629~~ C1629 /~~C 1629M~~ C1629M , *Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels*, ~~2006 (2011)~~ **2014a .**

ASTM ~~D 1929~~ D1929 , *Standard Test Method for Determining Ignition Temperatures of Plastic*, ~~2012~~ 201 **4** .

ASTM ~~D 2859~~ D2859 , *Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials*, 2006 ~~(~~ **, Reapproved 2011** ~~)~~ **.**

ASTM ~~D 2898~~ D2898 , *Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing*, 2010.

ASTM ~~E 84~~ E84 , *Standard Test Method for Surface Burning Characteristics of Building Materials*, ~~2013~~ **2015** .

ASTM ~~E 108~~ E108 , *Standard Test Methods for Fire Tests of Roof Coverings*, 2011.

ASTM ~~E 119~~ E119 , *Standard Test Methods for Fire Tests of Building Construction and Materials*, ~~2012a~~ 201 **4** .

ASTM ~~E 136~~ E136 , *Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C*, 2012.

ASTM ~~E 648~~ E648 , *Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source,* ~~2010 e1~~ 201 **4c** .

ASTM ~~E 814~~ E814 , *Standard Test Method for Fire Tests of Through-Penetration Fire Stops*, ~~2011a~~ 201 **3** a .

ASTM ~~E 1354~~ E1354 , *Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter*, ~~2011b~~ 201 **4 e1** .

ASTM ~~E 1537~~ E1537 , *Standard Test Method for Fire Testing of Upholstered Furniture*, ~~2012~~ 201 **3** .

ASTM ~~E 1590~~ E1590 , *Standard Test Method for Fire Testing of Mattresses*, ~~2012~~ 201 **3** .

ASTM ~~E 1591~~ E1591 , *Standard Guide for Obtaining Data for Deterministic Fire Models*, ~~2007~~ 20 **13** .

ASTM ~~E 1966~~ E1966 , *Standard Test Method for Fire-Resistive Joint Systems*, **2007** ~~(~~ **, Reapproved 2011** ~~)~~ **.**

ASTM ~~E 2072~~ E2072 , *Standard Specification for Photoluminescent (Phosphorescent) Safety Markings*, ~~2010~~ 201 **4** .

ASTM ~~E 2307~~ E2307 , *Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-Story Test Apparatus*, ~~2010~~ 201 **5** .

ASTM ~~E 2404~~ E2404 , *Standard Practice for Specimen Preparation and Mounting of Textile, Paper or Polymeric (Including Vinyl) Wall or Ceiling Coverings, and of Facings and Wood Veneers Intended to be Applied on Site Over a Wood Substrate, to Assess Surface Burning Characteristics*, ~~2012~~ 201 **3 e1** .

ASTM ~~E 2573~~ E2573 , *Standard Practice for Specimen Preparation and Mounting of Site-Fabricated Stretch Systems to Assess Surface Burning Characteristics*, 2012.

ASTM ~~E 2599~~ E2599 , *Standard Practice for Specimen Preparation and Mounting of Reflective Insulation, Radiant Barrier, and Vinyl Stretch Ceiling Materials for Building Applications to Assess Surface Burning Characteristics*, 2011.

ASTM ~~E 2652~~ E2652 , *Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750 Degrees C*, 2012.

ASTM ~~E 2768~~ E2768 , *Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test)*, 2011.

ASTM ~~F 851~~ F851 , *Standard Test Method for Self-Rising Seat Mechanisms*, 1987~~ (2005)~~ **, Reapproved 2013 .**

ASTM ~~F 1577~~ F1577 , *Standard Test Methods for Detention Locks for Swinging Doors*, 2005**, Reapproved 2012** .

ASTM ~~G 155~~ G155 , *Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials*, ~~2005a~~ **2013** .

2.3.7 FM Publications.

FM Global, ~~1301 Atwood~~ **270 Central Avenue** , P.O. Box 7500, Johnston, RI 02919. www.fmglobal.com

~~ANSI/FM 4880, American National Standard for Evaluating~~ FM **Approval** 4880, **Class 1 Fire Rating of** Insulated Wall or Wall and Roof/Ceiling ~~Assemblies~~ **Panels** , ~~Plastic~~ Interior Finish Materials ~~, Plastic Exterior Building Panels, Wall/Ceiling Coating Systems, Interior or Exterior Finish Systems, 2007~~ **Or Coatings** , **and** Exterior **Wall** Systems, **2010** .

FM Approval ~~Standard~~ 6921, *Containers for Combustible Waste*, 2004.

2.3.8 NEMA Publications.

National Electrical Manufacturers Association, 1300 North 17th Street, Suite ~~1847~~ **900** , ~~Rosslyn~~ **Arlington** , VA 22209.

NEMA SB 30, *Fire Service Annunciator and Interface*, 2005.

2.3.9 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096. www.ul.com

~~ANSI/~~ UL 9, ~~*Standard for*~~ *Fire Tests of Window Assemblies*, 2009.

~~ANSI/~~ UL 10B, ~~*Standard for*~~ *Fire Tests of Door Assemblies*, 2008, Revised 2009.

~~ANSI/~~ UL 10C, ~~*Standard for*~~ *Positive Pressure Fire Tests of Door Assemblies*, 2009.

~~ANSI/~~ UL 263, ~~*Standard for*~~ *Fire Tests of Building Construction and Materials*, 2011**, Revised 2014** .

~~ANSI/~~ UL 294, ~~*Standard for*~~ *Access Control System Units*, 1999, Revised ~~2010~~ 201 **5** .

~~ANSI/~~ UL 300, ~~*Standard for*~~ *Fire Testing of Fire Extinguishing Systems for Protection of Commercial Cooking Equipment,* 2005, Revised ~~2010~~ 201 **4** .

UL 300A **Outline** , **Outline Of Investigation For Extinguishing** ~~System~~ **Systen Units** ~~for~~ **For Residential Range Top Cooking Surfaces** , 2006.

~~ANSI/~~ UL 305, ~~*Standard for Safety*~~ *Panic Hardware*, 1997, Revised ~~2012~~ 201 **4** .

~~ANSI/~~ UL 555, ~~*Standard for*~~ *Fire Dampers*, 2006, Revised ~~2012~~ 201 **4** .~~ANSI/~~

UL 555S, ~~*Standard for*~~ *Smoke Dampers*, ~~1999, Revised 2012~~ **2014** .

~~ANSI/~~ UL 723, ~~*Standard for*~~ *Test for Surface Burning Characteristics of Building Materials*, 2008, Revised ~~2010~~ 201 **3** .

~~ANSI/~~ UL 790, *Test Methods for Fire Tests of Roof Coverings*, 2004, Revised ~~2008~~ 20 **14** .

~~ANSI/~~ UL 924, ~~*Standard for*~~ *Emergency Lighting and Power Equipment*, 2006, Revised ~~2011~~ 201 **4** .

~~ANSI/~~ UL 1040, ~~*Standard for*~~ *Fire Test of Insulated Wall Construction*, 2009, Revised ~~2013~~ 201 **2** .

~~ANSI/~~ UL 1315, ~~*Standard for*~~ *Safety for Metal Waste Paper Containers*, 2007, Revised ~~2013~~ 201 **2** .

~~ANSI/~~ UL 1479, ~~*Standard for*~~ *Fire Tests of Through-Penetration Firestops*, 2003, Revised 2012.

~~ANSI/~~ UL 1715, ~~*Standard for*~~ *Fire Test of Interior Finish Material*, 1997, Revised 2013.

~~ANSI/~~ UL 1784, ~~*Standard for*~~ *Air Leakage Tests for Door Assemblies*, 2001, Revised 2009.

~~ANSI/~~ UL 1975, ~~*Standard for Fire*~~ *Tests for Foamed Plastics Used for Decorative Purposes*, 2006.

~~ANSI/~~ UL 1994, ~~*Standard for*~~ *Luminous Egress Path Marking Systems*, 2004, Revised 2010.

~~ANSI/~~ UL 2079, ~~*Standard for*~~ *Tests for Fire Resistance of Building Joint Systems*, 2004, Revised ~~2012~~ 201 **4** .

2.3.10 U.S. Government Publications.

U.S. ~~Government Printing~~ Government **Publishing** Office, Washington, DC 20402. ~~www.access.gpo.gov~~

Title 16, Code of Federal Regulations, Part 1500 and Part 1507.

Title 16, Code of Federal Regulations, Part 1632, “Standard for the Flammability of Mattresses and Mattress Pads” (FF 4-72).

2.3.11 Other Publication.

Merriam-Webster’s Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

Statement of Problem and Substantiation for Public Input

Referenced current SDO names, addresses, standard names, numbers, and editions.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 22-NFPA 101-2015 [Global Input]	
Public Input No. 24-NFPA 101-2015 [Section No. C.1.2]	

Submitter Information Verification

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Public Input No. 413-NFPA 101-2015 [Section No. 2.3.2]

2.3.2 ANSI Publications.

American National Standards Institute, Inc., 25 West 43rd Street, 4th floor, New York, NY 10036.

ANSI A14.3, *Safety Requirements for Fixed Ladders*, 1992.

ICC/ANSI A117.1, *American National Standard for Accessible and Usable Buildings and Facilities*, 2009.

ANSI/BHMA A156.3 *Exit Devices*, 2008.

BHMA/ANSI A156.19, *American National Standard for Power Assist and Low Energy Power Operated Doors*, 2007.

ANSI Z223.1, *National Fuel Gas Code*, 2006.

Add new reference standard in Chapter 2:

Rehabilitation Engineering and Assistive Technology Society of North America (RESNA), 1700 North Moore Street, Suite 1540, Arlington, VA 22209

ANSI/RESNA ED-1 Evacuation Devices Volume 1: Emergency Stair Travel Devices for Individuals with Disabilities - 2013

Statement of Problem and Substantiation for Public Input

Emergency stair travel devices are now covered by a performance standard (ANSI/RESNA ED-1:2013), and the availability of these drives will greatly increase the safety of individuals with disabilities during evacuations.

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Public Input No. 129-NFPA 101-2015 [Section No. 2.3.6]

2.3.6 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959. www.astm.org

ASTM ~~C 1629~~ C1629 /~~C 1629M~~ C1629M , *Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels*, 2006 (2011).

ASTM ~~D 1929~~ D1929 , *Standard Test Method for Determining Ignition Temperatures of Plastic*, ~~2012~~ 2014 .

ASTM ~~D 2859~~ D2859 , *Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials*, 2006 (2011).

ASTM ~~D 2898~~ D2898 , *Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing*, 2010.

ASTM ~~E 84~~ E84 , *Standard Test Method for Surface Burning Characteristics of Building Materials*, ~~2013~~ 2015a .

ASTM ~~E 108~~ E108 , *Standard Test Methods for Fire Tests of Roof Coverings*, 2011.

ASTM ~~E 119~~ E119 , *Standard Test Methods for Fire Tests of Building Construction and Materials*, ~~2012a~~ 2014 .

ASTM ~~E 136~~ E136 , *Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C*, 2012.

ASTM ~~E 648~~ E648 , *Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source,* ~~2010 e1~~ 2014c .

ASTM ~~E 814~~ E814 , *Standard Test Method for Fire Tests of Through-Penetration Fire Stops*, ~~2011a~~ 2013a .

ASTM ~~E 1354~~ E1354 , *Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter*, ~~2011b~~ 2015a .

ASTM ~~E 1537~~ E1537 , *Standard Test Method for Fire Testing of Upholstered Furniture*, ~~2012~~ 2013 .

ASTM ~~E 1590~~ E1590 , *Standard Test Method for Fire Testing of Mattresses*, ~~2012~~ 2013 .

ASTM ~~E 1591~~ E1591 , *Standard Guide for Obtaining Data for Deterministic Fire Models*, ~~2007~~ 2013 .

ASTM ~~E 1966~~ E1966 , *Standard Test Method for Fire-Resistive Joint Systems*, 2007 (2011).

ASTM ~~E 2072~~ E2072 , *Standard Specification for Photoluminescent (Phosphorescent) Safety Markings*, 2010.

ASTM ~~E 2307~~ E2307 , *Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-Story Test Apparatus*, ~~2010~~ 2015a .

ASTM ~~E 2404~~ E2404 , *Standard Practice for Specimen Preparation and Mounting of Textile, Paper or Polymeric (Including Vinyl) and Wood Wall or Ceiling Coverings, ~~and of~~ Facings and ~~Wood~~ Veneers ~~Intended to be Applied on Site Over a Wood Substrate~~ , to Assess Surface Burning Characteristics*, ~~2012~~ 201 5 a .

ASTM ~~E 2573~~ E2573 , *Standard Practice for Specimen Preparation and Mounting of Site-Fabricated Stretch Systems to Assess Surface Burning Characteristics*, 2012.

ASTM ~~E 2599~~ E2599 , *Standard Practice for Specimen Preparation and Mounting of Reflective Insulation, Radiant Barrier, and Vinyl Stretch Ceiling Materials for Building Applications to Assess Surface Burning Characteristics*, ~~2011~~ 2015 .

ASTM ~~E 2652~~ E2652 , *Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750 Degrees C*, 2012.

ASTM ~~E 2768~~ E2768 , *Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test)*, 2011.

ASTM ~~F 851~~ F851 , *Standard Test Method for Self-Rising Seat Mechanisms*, 1987 (2005).

ASTM ~~F 1577~~ F1577 , *Standard Test Methods for Detention Locks for Swinging Doors*, 2005.

ASTM ~~G 155~~ G155 , *Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials*, 2005a.

Statement of Problem and Substantiation for Public Input

date updates

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Public Input No. 385-NFPA 101-2015 [Section No. 2.3.9]

2.3.9 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096. www.ul.com

ANSI/UL 9, *Standard for Fire Tests of Window Assemblies*, ~~2009~~ 2015 .

ANSI/UL 10B, *Standard for Fire Tests of Door Assemblies*, 2008, Revised ~~2009~~ 2015 .

ANSI/UL 10C, *Standard for Positive Pressure Fire Tests of Door Assemblies*, ~~2009~~ 2015 .

ANSI/UL 263, *Standard for Fire Tests of Building Construction and Materials*, ~~2011~~ 2014 .

ANSI/UL 294, *Standard for Access Control System Units*, 1999, Revised ~~2010~~ 2014 .

ANSI/UL 300, *Standard for Fire Testing of Fire Extinguishing Systems for Protection of Commercial Cooking Equipment,* 2005, Revised ~~2010~~ 2014 .

UL 300A, *Extinguishing System Units for Residential Range Top Cooking Surfaces,* 2006.

ANSI/UL 305, *Standard for Safety Panic Hardware*, 1997, Revised ~~2012~~ 2014 .

ANSI/UL 555, *Standard for Fire Dampers*, 2006, Revised ~~2012~~ 2014 .

ANSI/UL 555S, *Standard for Smoke Dampers*, 1999, Revised ~~2012~~ 2014 .

ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*, 2008, Revised ~~2010~~ 2013 .

ANSI/UL 790, *Test Methods for Fire Tests of Roof Coverings*, 2004, Revised ~~2008~~ 2014 .

ANSI/UL 924, *Standard for Emergency Lighting and Power Equipment*, 2006, Revised ~~2011~~ 2014 .

ANSI/UL 1040, *Standard for Fire Test of Insulated Wall Construction*, 2009, Revised 2013.

ANSI/UL 1315, *Standard for Safety for Metal Waste Paper Containers*, 2007, Revised 2013.

ANSI/UL 1479, *Standard for Fire Tests of Through-Penetration Firestops*, 2003, Revised 2012.

ANSI/UL 1715, *Standard for Fire Test of Interior Finish Material*, 1997, Revised 2013.

ANSI/UL 1784, *Standard for Air Leakage Tests for Door Assemblies*, 2001, Revised ~~2009~~ 2015 .

ANSI/UL 1975, *Standard for Fire Tests for Foamed Plastics Used for Decorative Purposes*, 2006.

ANSI/UL 1994, *Standard for Luminous Egress Path Marking Systems*, 2004, Revised ~~2010~~ 2015 .

ANSI/UL 2079, *Standard for Tests for Fire Resistance of Building Joint Systems*, 2004, Revised ~~2012~~ 2014 .

Statement of Problem and Substantiation for Public Input

The proposed changes reflect updated editions of the UL Standards

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Public Input No. 240-NFPA 101-2015 [New Section after 3.3.18]

3.3.19 Animal Housing Facility

Area of a building or structure, including interior and adjacent exterior spaces, where animals are fed, rested, worked, exercised, treated, exhibited, or used for production.

Statement of Problem and Substantiation for Public Input

This will require a renumbering as 3.3.19 is currently assigned to Apartment Building. This definition is required in order to allow for the inclusion of Animal Housing Facility as a Special Structure in Chapter 11.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 242-NFPA 101-2015 [New Section after 11.11.6.2.3]	

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Public Input No. 388-NFPA 101-2015 [New Section after 3.3.36.5]

TITLE OF NEW CONTENT

3.3.36.5.1 Where compliance with NFPA was originally required at time of erection or when officially authorized, the building would be required to meet the new building requirements of NFPA in affect at that time.

Statement of Problem and Substantiation for Public Input

This addition would help correct a couple of items. First, it would account for items that slipped through the cracks that would not be acceptable for new facilities but would be acceptable for existing facilities. Second, for facilities where professionals are required to complete ongoing inspections for compliance with NFPA, it clearly shows what is truly legitimate conditions that should be acceptable as truly existing conditions versus items that were deficient at the beginning.

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persist working the problem on both ends.

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Public Input No. 95-NFPA 101-2015 [New Section after 4.1.2]

4.1.3 Hazardous Materials Emergencies

An additional goal is to provide reasonable life safety during emergency events involving hazardous materials regulated by NFPA 30, NFPA 45, NFPA 54, NFPA 55, NFPA 58, NFPA 400, and NFPA 495.

Additional Proposed Changes

File Name	Description	Approved
A.4.1.3.docx	Proposed Annex Section A.4.1.3	

Statement of Problem and Substantiation for Public Input

This Public Input is submitted on behalf of the Hazardous Materials Task Group. The Life Safety Code Correlating Committee appointed the Hazardous Materials Task Group to review hazardous materials provisions within the code and provide a recommendation. This Task Group included representative membership from the Life Safety Code core and occupancy chapters. The Task Group agreed that a gap existed and ultimately recommended additional provisions to more comprehensively address hazardous materials within the Life Safety Code. The agreed set of recommendations include revisions to the following sections: 1.1.5, 4.1.3, 4.2.3, 6.2.2, 7.12, 8.7.3 and new Annex C. The majority of the revisions reference existing NFPA standards, rather than create new technical requirements within the code. Scoping sections for these standards are reproduced within a new Annex C to provide guidance. Proposed Annex Section A.4.1.3 is included for clarity.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 94-NFPA 101-2015 [New Section after 1.1.4]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 96-NFPA 101-2015 [New Section after 4.2.2]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 97-NFPA 101-2015 [Section No. 6.2.2.1]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 98-NFPA 101-2015 [New Section after 7.11.6]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 99-NFPA 101-2015 [Section No. 8.7.3]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 100-NFPA 101-2015 [New Section after B.4]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 94-NFPA 101-2015 [New Section after 1.1.4]	
Public Input No. 96-NFPA 101-2015 [New Section after 4.2.2]	

Public Input No. 97-NFPA 101-2015 [Section No. 6.2.2.1]

Public Input No. 98-NFPA 101-2015 [New Section after 7.11.6]

Public Input No. 99-NFPA 101-2015 [Section No. 8.7.3]

Public Input No. 100-NFPA 101-2015 [New Section after B.4]

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Zip:
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A.4.1.3 See Annex C – NFPA Documents on Hazardous Materials.

Public Input No. 380-NFPA 101-2015 [New Section after 4.1.3]

4.1.4* General Fall Safety During Use.

Buildings shall be designed, constructed and maintained to reduce the probability of injury, including death, to occupants from falls during normal use of means of egress as well as during emergency use.

Additional Proposed Changes

File Name	Description	Approved
Pauls-NFPA_101_Scope_Proposal_Justification.docx	This file provides the full justification for the public input.	

Statement of Problem and Substantiation for Public Input

Falls lead to many more injuries than does fire and most of the falls occur in non-emergency conditions. They warrant close attention in NFPA 101 not only because the risk of predictable and preventable falls is one that has to be managed carefully for emergency egress quite aside from the huge benefit to public health of managing the risk in all conditions of use. See the full substantiation in the uploaded Word file, "Pauls-NFPA 101 Scope Proposal Justification."

Submitter Information Verification

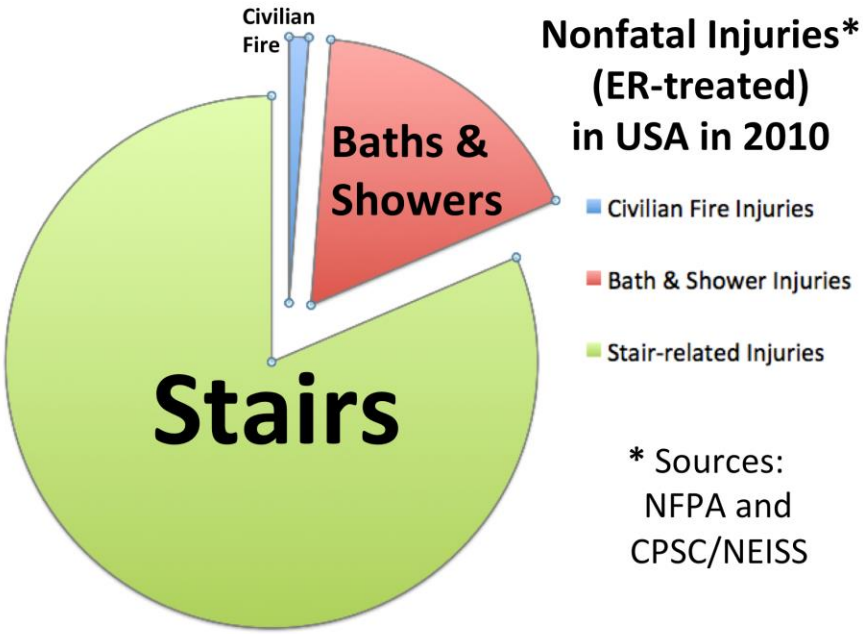
Submitter Full Name: JAKE PAULS
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Notes for Proposals for New Section for NFPA 101, Chapter 4, on Fall Safety

The following is excerpted from the detailed justification used for a set of proposals for new requirements in NFPA 101 and NFPA 5000 for provision of grab bars for new bath/shower facilities in several occupancy chapters. The were submitted by Jake Pauls, CPE, representing himself and Linda Strobl, Public Health Nurse, Ontario.

The evidence clearly indicates the need for much expanded attention to falls of occupants in the means of egress, especially when those dangers are compared to fires and, moreover, as the measures to accomplish improved fall prevention and mitigation are similar to those required for safety during fires. Here follows the verbatim excerpt from the above-noted set of proposals submitted for NFPA 101 and NFPA 5000. Consider first the pie chart below.

Comparisons of Three Prominent Dangers. Grab bars are just as important—*for everyone*—as are handrails on stairs. Even with their slightly different objectives, both NFPA 5000 and NFPA 101 do not permit new stairs without handrails. New bathing facilities are similarly in need of Code requirements for grab bar installation as a mainstreamed measure for safety in all conditions of use—*by all users.* Indeed, from a risk-per-use perspective, each step into and out of a bathing facility is, currently—without grab bars—far more dangerous than is taking a step up or down on a stair. See the pie chart below that clearly shows the high number of injuries associated with baths and showers in the USA in 2010.



Injury Epidemiology. The following are some insights from the US Consumer Product Safety Commission National Electronic Injury Surveillance System (CPSC-NEISS) product code 611 for bathtubs or showers, excluding enclosures, faucets, spigots and towel racks. For the year 2010, CPSC-NEISS estimated 262,745 visits to hospital emergency rooms based on a sample count (from about 100 hospitals) of 6,946 visits for which short naratives can be downloaded from its Web site. Such visits, with or without treatment, occurred to people of all ages. Those that resulted in hospital admission—23,107 estimated cases in the US in 2010—occurred prominently (roughly 77%) among people 60 years and older, i.e., persons more vulnerable to serious injury in falls and having more complications in health status generally.

Special Dangers of Baths and Showers. What all people faced, and continue to face, in the use of bathtubs or showers are wet surfaces that (being chosen for their ease of cleaning) are generally hard and smooth plus, unlike other ambulation challenges, they might require stepping over tub walls typically about 15 inches above the floor—even higher with some large, showpiece tubs increasingly found in homes. Furthermore some surfaces may be degraded with slippery soap and shampoo chemicals that drastically affect slip resistance. Moreover, those people dependent on corrective glasses for clear vision, would encounter these conditions without them. There are other conditions, common in bathing, that exacerbate injury dangers even more. There are virtually no countermeasures commonly installed to mitigate some of these dangers; the only solid "points of control" (something to hold onto securely) might be the edges of a vanity countertop but these, like other features of the bathroom, are not designed to be grasped with sufficient security to avert or mitigate a fall. These other features might include towel racks or flimsy storage shelving for toiletries, etc. They might take small loads but are not designed to mitigate a fall nor are they, biomechanically designed to be in the right place and the right size.

Societal Injury Costs. The societal costs, in the USA in 2010, of the bath and shower-related injuries were estimated at about 20 billion dollars (with, as noted above, about 263,000 injuries leading to a hospital ER visit). For comparison, stair-related injuries were responsible for about 92 billion dollars and led to about 1,232,000 visits to US hospital ERs. Societal cost per injury is about the same for each injury type. Source, which used CPSC/NEISS data: Lawrence, B., Spicer, R., Miller, T. A fresh look at the costs of non-fatal consumer product injuries. *Injury Prevention,* digital publication, August 2014, paper journal publication, 2015:**21**:23-29.

Fire-related injuries to civilians affected occurred to fewer than 20,000 people in the USA (according to NFPA-published estimates) and that figure has dropped by about half in recent decades (whereas stair-related injuries, especially in homes, have doubled.)

Literature Resources. There is extensive literature on ergonomic and public health aspects of important features such as handrails and grab bars. Rather than get into that literature base here, we should note that the general problem of differing orientations of public health and building-related professionals has been thoughtfully addressed by a well-known researcher, and proponent of bath grab bars in the Canadian code-development system, Dr. Nancy Edwards. Her paper, calling for a bridging between the differing perspectives of these groups of professionals also appeared in the same journal as noted above: Edwards, N. (2008). Performance-based Building Codes: A call for injury prevention indicators that bridge health and building sectors. *Injury Prevention,* 2008, 14: 329-332. That paper cites specific research on grab bars including Sveistrup H, Lockett D, Edwards N, et al. Evaluation of bath grab bar placement for older adults. *Technology and Disability* 2006;13:1–11. The leading recommendation from that study has strongly influenced what is being proposed for NFPA 5000 and NFPA 101, i.e.:

> "A minimum of two grab bars should be installed in all bathtubs used by seniors, one on the faucet wall (vertical) for entering and exiting the tub, and one on the back wall (horizontal or on an angle) to help with sitting down and standing up."

Collaborative Efforts Employed. In the case of the grab bar proposals, described here, they specifically result from a collaboration of individuals coming from the building field and the public health field, with the former having extensive credentials in ergonomics (Board Certified in the field) and the latter working in public health but also serving on a task group focused on grab bar requirements for codes and on the equivalent of an NFPA Technical Committee responsible for a significant part of the National Building Code of Canada, Part 9, dealing with

houses. The latter, Linda Strobl, is also the first recipient of the award, conferred by the Canadian Public Health Association in 2015, named after a prominent professional in Canadian model code history—*R. Stirling Ferguson*—who, among other important duties on model codes, served on NFPA 101's main committee, "The Committee on Safety to Life," during the 1960s. The R. Stirling Ferguson Award recognizes special achievement by an individual or organization in improving the evidence base for standards and codes for the built environment.

Thus, the proposals for grab bars are the result of a great deal of consideration based on ergonomics and epidemiology as well as etiology (i.e., pertaining to the causes of falls) among other types of justification.

Public Policies. Moreover, the proposed addition of grab bar requirements for baths and showers has been addressed in the formal policy statement adopted in 2009 by the American Public Health Association (APHA), the world's oldest and largest organization of public health professionals. Jake Pauls has been the lead representative of the APHA on several NFPA committees since 2001 (as well as the ICC Industry Advisory Committee since the mid 1990s). The Canadian Public Health Association also has formally adopted policy positions related to grab bars. Other notable names from public health, urging such new requirements, could also be mentioned here but the broadly based impetus behind this set of proposals should be very clear to NFPA committees. The relevant recommendation from APHA Policy 200913 follows:

> 4. ICC and NFPA, in developing model codes and standards, should use generally a "universal design" or inclusive design philosophy, which maximizes safety and usability for the largest range of people, including elderly people or those of any age with disabilities. This includes scoping—for all new homes (subject to some very limited exemptions)—of ICC/ANSI A117.1-2009 requirements for "visitable dwelling units" as well as installation of grab bars, on the basis of ICC/ANSI A117, for all bathtubs and bathtub shower combinations of new dwelling units as well as hotel rooms.

Notably, the proposls for grab bar provision go beyond dwelling units and hotel rooms. This reflects the growing sophistication and specialization of funtions that, tradtionally, occurred within dwelling units for example. These include functions now being addressed also in long-term care (such as in nursing homes) and other supportive care (such as adult day care centers plus board and care facilities). Moreover, dwelling units are found not only in detached houses but, increasingly, in apartments and medical care is provided in smaller, less-institutional settings such as ambulatory health care facilities. All of these are likely to have showering or bathing facilities—even major airport terminals, serving long-haul flights, have shower facilities for pasengers and perhaps others as well (the one occupancy not yet mentioned in this background to our proposals, but one that NFPA might want to consider for standards and codes beyond NFPA 101 and 5000).

Summing Up. The proposals (including their technical requirements based on certain requirements of ICC ANSI A117.1 and important research) warrant very careful consideration, and acceptance, by the various NFPA Technical Committees to whom they are directed. The proposals are responsive to a major injury problem in buildings, with huge injury treatment cost and disability ramifications, in addition to general health benefits including sanitation and wellbeing generally. They are very much within the scope of NFPA's currently stated mission, "*We help save lives and reduce loss with information, knowledge and passion*," and the full scope of its codes and standards which, while historically developed to address fire safety, are now *not* restricted to fire safety.

Public Input No. 96-NFPA 101-2015 [New Section after 4.2.2]

4.2.3 Hazardous Materials Emergencies Protection

Fundamental safeguards shall be provided to reasonably prevent or mitigate events involving hazardous materials as addressed in 4.1.3 to allow the time needed to evacuate, relocate, or defend in place occupants who are not intimate with the initial emergency incident.

Additional Proposed Changes

File Name	Description	Approved
A.4.2.3.docx	Proposed Annex Section A.4.2.3	

Statement of Problem and Substantiation for Public Input

This Public Input is submitted on behalf of the Hazardous Materials Task Group. The Life Safety Code Correlating Committee appointed the Hazardous Materials Task Group to review hazardous materials provisions within the code and provide a recommendation. This Task Group included representative membership from the Life Safety Code core and occupancy chapters. The Task Group agreed that a gap existed and ultimately recommended additional provisions to more comprehensively address hazardous materials within the Life Safety Code. The agreed set of recommendations include revisions to the following sections: 1.1.5, 4.1.3, 4.2.3, 6.2.2, 7.12, 8.7.3, and new Annex C. The majority of the revisions reference existing NFPA standards, rather than create new technical requirements within the code. Scoping sections for these standards are reproduced within a new Annex C to provide guidance. Proposed Annex Section A.4.2.3 is included for clarity.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 94-NFPA 101-2015 [New Section after 1.1.4]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 95-NFPA 101-2015 [New Section after 4.1.2]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 97-NFPA 101-2015 [Section No. 6.2.2.1]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 98-NFPA 101-2015 [New Section after 7.11.6]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 99-NFPA 101-2015 [Section No. 8.7.3]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 100-NFPA 101-2015 [New Section after B.4]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 94-NFPA 101-2015 [New Section after 1.1.4]	
Public Input No. 95-NFPA 101-2015 [New Section after 4.1.2]	
Public Input No. 97-NFPA 101-2015 [Section No. 6.2.2.1]	

Public Input No. 98-NFPA 101-2015
[New Section after 7.11.6]

Public Input No. 99-NFPA 101-2015
[Section No. 8.7.3]

Public Input No. 100-NFPA 101-2015
[New Section after B.4]

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A.4.2.3 See 4.1.3 and Annex C for referenced documents on hazardous materials.

Public Input No. 319-NFPA 101-2015 [New Section after 4.6.12.1]

Hazard Evalulation

4.6.12.1.1 Occupancies containing water-based fire protection systems shall be subject to evaluation to identify changes in the occupancy, hazard, water supply, storage commodity, storage arrangement, building modification, or other condition that affects the installation criteria of the system in accordance with table 4.6.12.1.1

Table 4.6.12.1.1

Occupancy Classification	Frequency
Assembly Educational Day Care Health Care Ambulatory Care Detention & Correctional Residential Residential Board & Care Business	10 years
Mercantile Industrial Storage	5 years

4.6.12.1.1.1 The evaluation required in 4.6.12.1.1 shall be performed by persons acceptable to the AHJ.

4.6.12.1.1.2 Where the evaluation reveals that the installed system is inadequate to protect the building or hazard in question, the property owner or designated representative shall make the required corrections. [***25:*** *4.1.7.2*]

Statement of Problem and Substantiation for Public Input

This correlates with NFPA 5000 PI 106

Changes in occupancy, use or process, or materials used or stored in the building are addressed by NFPA 25 and trigger the owner to have their system evaluated for its capacity to protect the new occupancy. At a minimum, this requires the owner to play an active role in the process by reporting these changes when they occur. Additionally it requires the owner to have specific knowledge of what is occurring in their building at all times, which may not always be the case. Examples of this include warehouse occupancies where spaces are leased and tenants often change. This can result in storage arrangements and/or commodities not contemplated during system design. System design is outside the scope of NFPA 25 and evaluating the system is not part of routine inspection, testing and maintenance required by that standard.

This proposal addresses the issue by ensuring that changes effecting sprinkler performance are identified on a set frequency rather than by chance and that the fire protection systems are capable of protecting the hazard.

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Public Input No. 416-NFPA 101-2015 [New Section after 4.6.12.1]

4.6.12.1.1 ***Whenever impairments, critical deficiencies, or non-critical deficiencies are identified in water based fire protection systems maintained under NFPA 25, they shall be corrected in accordance with 4.6.12.1.1.1 through 4.6.12.1.1.3.***

4.6.12.1.1.2* ***Critical Deficiencies***

4.6.12.1.1.2.1 ***Critical deficiencies shall be corrected or repaired within 30 days.***

4.6.12.1.1.2.2 ***Corrections or repairs shall be permitted to be made after 30 days if an approved corrective action plan is approved by the AHJ.***

4.6.12.1.1.3* ***Non-Critical deficiencies***

4.6.12.1.1.3.1 ***Non-Critical deficiencies shall be corrected or repaired within 90 days.***

4.6.12.1.1.3.2 ***Corrections or repairs shall be permitted to be made after 90 days if an approved corrective action plan is approved by the AHJ.***

Statement of Problem and Substantiation for Public Input

This language sets specific time frames for corrective action to remedy impairments, critical deficiencies, and non-critical deficiencies identified by NFPA 25. This language has also been proposed for NFPA 1 following 1: 4.5.8.1 [101:4.6.12.1].

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 417-NFPA 101-2015 [New Section after A.4.6.10.2]	
Public Input No. 418-NFPA 101-2015 [Section No. 9.11]	

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Public Input No. 189-NFPA 101-2015 [Section No. 4.6.14]

4.6.14* Limited-Combustible Material.

A material shall be considered a limited-combustible material where all the conditions of 4.6.14.1 and 4.6.14.2, and the conditions of either 4.6.14.3 or 4.6.14.4, are met.

4.6.14.1

The material shall not comply with the requirements for noncombustible material in accordance with 4.6.13.

4.6.14.2

The material, in the form in which it is used, shall exhibit a potential heat value not exceeding 3500 Btu/lb (8141 kJ/kg) where tested in accordance with NFPA 259, *Standard Test Method for Potential Heat of Building Materials*.

4.6.14.3

The material shall have the structural base of a noncombustible material with a surfacing not exceeding a thickness of ⅛ in. (3.2 mm) where the surfacing exhibits a flame spread index not greater than 50 when tested in accordance with ASTM E 84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*.

4.6.14.4

The material shall be composed of materials that, in the form and thickness used, neither exhibit a flame spread index greater than 25 nor evidence of continued progressive combustion when tested in accordance with ASTM E 84, *Standard Test Method for Surface Burning Characteristics of Building Materials,* or ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials,* and shall be of such composition that all surfaces that would be exposed by cutting through the material on any plane would neither exhibit a flame spread index greater than 25 nor exhibit evidence of continued progressive combustion when tested in accordance with ASTM E 84 or ANSI/UL 723.

4.6.14.5

An alternate approach for a material to be considered a limited combustible material is where the material is tested in accordance with ASTM E2965, Standard Test Method for Determination of Low Levels of Heat Release Rate for Materials and Products Using an Oxygen Consumption Calorimeter at an incident heat flux of 75 kW/m^2 for a 20 minute exposure and: (a) the peak heat release rate does not exceed 200 kW/m^2 for longer than 10 seconds and (b) the total heat released does not exceed 8 MJ/m^2.

4.6.14.6

Where the term *limited-combustible* is used in this *Code*, it shall also include the term *noncombustible*.

(also, add ASTM E2965, Standard Test Method for Determination of Low Levels of Heat Release Rate for Materials and Products Using an Oxygen Consumption Calorimeter, 2015, into section 2.3.6 on ASTM publications)

Additional Proposed Changes

File Name	Description	Approved
Large_cone_main_paper_Gregory_et_al_Interflam.pdf	Reference to the work conducted to develop the test method.	

Statement of Problem and Substantiation for Public Input

For many years there have been debates about using modern technology to assess whether a material provides very little added fire hazard compared to a non-combustible material. The technology used in NFPA 101 and in NFPA 5000 is based on NFPA 259 and ASTM E84, both venerable tests of 1950s vintage.

Task Group E05.23.01 first met in December of 1987 at the ASTM E05 meeting in Bar Harbor, FL. The Task Group was charged with the development of an ASTM standard test method to measure degrees of combustibility based on heat release rate. The history of the development of that work is presented below.

1. The idea to use small-scale heat release rate data as a measure of the combustibility of a product was first proposed by Prof. Ed Smith at Ohio State University. This effort later resulted in the development of the Ohio State University (OSU) calorimeter (standardized as ASTM E906 and used by the FAA for regulatory purposes of large surfaces in aircraft)..
2. The first attempt at developing a standard describing a method to measure combustibility of products on the basis of heat release rate was made in Canada. Task Group No. 22 of the Underwriters' Laboratories of Canada (ULC) Committee on Fire Tests was formed in 1980 to develop a test method to evaluate building products in terms of degrees of combustibility. Initially, the ULC Task Group considered modifying the standard test method for non- combustibility of building products (CAN/ULC-S114) to obtain quantitative measurements suitable for ranking products in terms of degrees of combustibility. Attempts were made to rank products on the basis of maximum temperature rise and the area under the temperature-time curves. After a series of round-robin tests, it was the consensus of the Task Group that the non-combustibility furnace was not suitable. This was consistent with the results of a study conducted in Finland which concluded that there is no consistency between the temperature rise measurements in the ISO 1182 non-combustibility furnace and heat release rate measured on the basis of oxygen consumption. In addition, the Task Group considered the CAN/ULC-S114 method to be somewhat limited for the following reasons:
a. A quantitative measurement is preferable to a pass/fail type test;
b. Heating of one surface of a specimen is preferable to heating of a block of material; and
c. The CAN/ULC-S114 test is limited to elementary building materials, and a test method applicable to composite products is preferable.

3. Work was done at the National Research Council of Canada (NRCC) to explore the use of the OSU calorimeter for measuring degrees of combustibility. The OSU apparatus at NRCC was equipped with oxygen consumption instrumentation, and the airflow through the apparatus was reduced to half the flow prescribed in the ASTM E 906 and FAA versions of the test method to increase accuracy and sensitivity of the heat release rate measurements. Four products were tested with heat release rates ranging from 8 to 300 kW/m².

4. Around the same time, Forintek Canada Corporation explored the use of the Cone Calorimeter for measuring degrees of combustibility. Seventeen different products were tested in the horizontal and vertical orientation at 40 and 50 kW/m². The lower heat flux level was chosen to obtain results that could be compared to the modified OSU data from the NRCC study. The higher heat flux level was chosen to be comparable to the irradiance in the CAN/ULC-S114 test, since 50 kW/m² is equal to the radiative heat flux from a blackbody source at 700°C.

5. The work of the ULC Task Group resulted in a new standard test method CAN/ULC-S135, "Standard Method for Determination of Degrees of Combustibility of Building Materials Using an Oxygen Consumption Calorimeter (Cone Calorimeter)." The standard was published in 1992, and was largely based on the research conducted at Forintek. The method described in CAN/ULC-S135 is nearly identical to that in ASTM E 1354, except for the following important modifications:
a. A different specimen holder is used so that the bottom and the sides of the specimen are insulated with ceramic fiber blanket;
b. The test duration is fixed at 15 min;

c. Mass loss measurements are optional; and
d. Smoke obscuration measurements are not included.

Products are tested in triplicate, in the horizontal orientation, at a heat flux of 50 kW/m², and with the spark igniter. Several proposals have been published for a classification system based on CAN/ULC-S135 test performance and its incorporation into the building codes. Chen et al., in Taiwan, evaluated 18 products in the Cone Calorimeter according to the test procedure in CAN/ULC S135, but with the horizontal specimen holder specified in ASTM E 1354. The results from this study were consistent with earlier work at Forintek, and qualitative agreement was found between CNS 6532 (equivalent to JIS 1321) and the classification system proposed by Richardson and Brooks.

6. In October 1992, the Board for the Coordination of the Model Codes (BCMC) formed a Task Group to work on new definitions for the terms “Non-Combustible”, “Limited Combustible”, and “Combustible”. Following general discussions of the issue over the first year after its formation, the BCMC Combustibility Task Group decided to pursue the ' development of a system of "degrees of combustibility" akin to a proposal under consideration in Canada based on results obtained from Cone Calorimeter tests performed according to CAN/ULC S135.

7. At the March 1994 BCMC Task Group meeting, it was decided to use the Cone Calorimeter as described in ASTM E 1354. A Subcommittee was formed to look at the details of the test procedure and formulate a proposal. The Subcommittee met in April 1994, and presented its report at the Task Group meeting in June 1994. The Subcommittee recommended the BCMC test protocol call for

a. An irradiance level of 75 kW/m2;
b. Testing in the horizontal orientation;
c. Mandatory use of the retainer frame described in ASTM E 1354;
d. Use of the spark plug ignition pilot;
e. Measurements every two seconds;
f. A fixed test duration of 15 minutes; and
g. Other test and reporting details as in ASTM E 1354.

The BCMC protocol is significantly different from that described in CAN/ULC 5135. Most of the deviations from the Canadian standard were motivated by NIST recommendations made a few years earlier. After lengthy discussion, the Task Group accepted the proposed protocol and disbanded the Subcommittee.

8. Subsequently, a new Subcommittee was formed to develop a database of Cone Calorimeter measurements obtained under test conditions comparable to those specified by the BCMC protocol. In addition, the Subcommittee was instructed to determine feasibility of the development of a classification system of four or five degrees of combustibility on the basis of the database. The Subcommittee collected Cone Calorimeter data obtained at 75 kW/m2 in the horizontal orientation for 111 products, and organized the data in tabular form and in bar charts. Most of the data were obtained at NIST. Strictly speaking, none of these tests were conducted according to the BCMC protocol, since all tests were run with a five second interval between measurements. However, the reduction from five to two seconds only results in better precision of the maximum heat release rate. The retainer frame was used for less than 10 percent of the tests in the database. Research has shown that the heat sink effect of the frame can be accounted for by reducing heat release rate data obtained without the frame by approximately 6 percent [10-11]. Therefore, it was agreed that the test conditions were close enough to those prescribed by the BCMC protocol so that valid conclusions could be reached concerning the feasibility question.

9. The Subcommittee analyzed the data in detail at a meeting in April 1995. It was concluded that there are sufficient Cone Calorimeter data so that a classification system for degrees of combustibility can be developed. Proposed class limits were based on two limiting values; total heat release, and the maximum of a one-minute sliding average heat release rate. Some Subcommittee members questioned whether the precision of the Cone Calorimeter is sufficient to justify regulatory use of the test method. The concern was based on poor reproducibility estimated from a recent Cone Calorimeter round robin conducted under the auspices of the ASTM Institute for Standards Research

(ISR). In addition, significant discrepancies were found between two laboratories in the U.S. for identical gypsum board specimens tested under the same conditions. The Subcommittee also identified the need to quantify the effect of the retainer frame more precisely.

10. The Subcommittee presented its findings to the Task Group at a meeting in June, 1995. The Task Group instructed the Subcommittee to organize a Cone Calorimeter round robin with the purpose of determining the precision of the instrument specifically for the BCMC test protocol. The Subcommittee was asked to focus on the commercial testing laboratories in North America, and to present a detailed plan (products, participating laboratories, time schedule, etc.) at the next BCMC Task Group meeting in October, 1995. The Task Group formed a new Subcommittee to develop a strategy for implementation of a system for degrees of combustibility in the model codes. Unfortunately, BCMC was disbanded shortly after the October 1995 meeting, resulting in an unclear future for the test project. However, at the same time the Board for the Development of a Model Code (BDMC) was formed by the International Code Council (ICC) to pick up many of the activities of the Council of American Building Officials (CABO), including those of the BCMC. The BDMC decided to maintain the BCMC activities in the area of combustibility. In a memorandum to interested parties from the BDMC secretariat dated May 29, 1996 it was stated that "... The round robin tests are required to document test results and address the repeatability and reproducibility issue of the test method. Conducting the round robin tests in accordance with the BDMC protocol and analyzing the data is pertinent to this project. Until financial support or other means are obtained to proceed with the round robin tests in accordance with the BDMC protocol, no time frame for completion by the task group can be established and therefore, there can be no further activity on this BDMC agenda item."

11 In April, 1996 the NFPA Fire Tests Committee discussed a proposal describing the use of the Cone Calorimeter for determining degrees of combustibility of products according to the protocol developed by the BCMC. After lengthy discussion, the Committee voted on a motion to support the proposal. The outcome was undecided, and a Task Group was formed to review the issue and to make a recommendation to the Committee at its next meeting in October 1996. Since no new information had been obtained since the BCMC was disbanded, the NFPA Task Group reached the same conclusion as the BCMC Combustibility Task Group did one year earlier, i.e., that there is a need for a series of interlaboratory tests to determine the precision of the test method for this application.

12. In the spring of 1997 the Pacific Fire Laboratory (PFL) took the initiative to prepare a proposal for the round robin to prospective sponsors. The following seven organizations joined the project: American Forest & Paper Association, Armstrong World Industries, Inc., Atlas Electric Devices Company, Canadian Wood Council, Cellulose Insulation Manufacturers Association, W.R. Grace & Company, and Wilsonart International Inc. Representatives of sponsors and four participating commercial laboratories together with Dr. Joe Urbas, the project coordinator, formed the "Cone Calorimeter Round Robin Consortium" (Consortium) to organize the project. The Consortium defined the scope of the project, selected the products to be tested, confirmed the participating laboratories, defined the calibration procedure, and confirmed the test protocol. according to the protocol developed by the Board for the Coordination of the Model Codes (BCMC). All laboratories first performed extensive calibrations of their equipment, and conducted preliminary tests on two reference products (black PMMA with a relatively high heat release output and mineral ceiling board with a relatively low heat release output). The calibration and reference test data were used to correct minor discrepancies and inconsistencies prior to the round robin tests. Sixteen building products covering a wide range of heat release rates were tested in triplicate by each laboratory according to the BCMC protocol. All testing was completed by the summer of 1998, and it took approximately 18 months to analyze and review the data and to finalize the report. The sponsors finally released the report in the spring of 2000. The precision data presented in the report are comparable to those obtained in earlier round robins as reported in the ISO, ASTM, and other Cone Calorimeter standards, and are valid for a wider range of heat release rates [13].

13. Over the years since its inception the ASTM Task Group E05.23.01 continuously monitored activities pertinent to the use of the Cone Calorimeter for measuring degrees of combustibility of products. A first draft based on the BCMC protocol was distributed at the New Orleans Task Group

meeting in December 1999.

14. Legislation was introduced into several countries, including Canada, Japan and Taiwan, to regulate "quasi non combustible materials" using the cone calorimeter (ASTM E1354 or ISO 5660). A concern that was expressed frequently was that the errors were similar in order of magnitude to the measurements needed.

15. Work was initiated in ISO TC92 SC1 to develop a variation of the cone calorimeter, ISO 5660-4, that could be used for such low heat release measurements.

16. It was later discovered that a larger cone heater and a larger test specimen were needed in order to get the variability of the measurement to become significantly smaller than the required measured values. Other concerns were related to drift of the signal and noise. Work was conducted in England by Sean Gregory et al. (manuscript attached) to solve these problems.This concept was first introduced into ASTM in 2011 and balloted at that time. Several subsequent ballots followed, refining the procedure, with special emphasis on issues such as flow rate and capturing the entirety of the smoke emitted, which required a larger hood.

17. A successful ballot was completed earlier this year and standard E2965, Standard Test Method for Determination of Low Levels of Heat Release Rate for Materials and Products Using an Oxygen Consumption Calorimeter, has been approved,

18. The criteria proposed are based on the Japanese criteria, with a higher incident heat flux (75 kW/m2 instead of 50 kW/m2) so that any materials that would meet the requirements would contain almost no combustible content.

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USE OF THE CONE CALORIMETER FOR TESTING MATERIALS WITH LOW HEAT RELEASE RATES

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ABSTRACT

The ISO 5660[1] and ASTM E1354 [2] cone calorimeter developed by Babrauskas was designed to measure heat release from combustible materials such as wood plastics and building products. These typically have peak HRR of 250- 2000 kW/m^2. The results were either used directly or as data for numerical models.

Japan and Canada have already issued standards and regulate using heat release measurements based on Cone calorimeter data generated using protocol and apparatus similar to that outlined in ISO 5660-1. The Japanese usage of the ISO 5660-1 along with the performance limits (peak HRR must not exceed 200kW/m^2 and total HRR in 20 mins should not exceed 8 MJ/m^2) has shown that test protocol and apparatus specifications outlined in ISO 5660 can lead to "within standard allowable" errors that constitute a significant fraction of the allowable performance levels

ISO 5660 analyser specification allows for 50ppm analyser drift and 50ppm noise, which could translate to 3-4 MJ errors. This would only amount to 0.3% on a typical 1000MJ/m^2 material but 40–50% of the 8MJ/m^2 required by Japanese regulations

In our study reported in 2005[3] we identified need for improvement measurement by:

- Reducing analyser noise and drift by specifying a lower performance requirement
- Tighten laboratory practice to remove interfering influences
- Increasing the oxygen depletion levels

This paper identifies improvement areas in all of the above but most specifically addresses the topic of increasing oxygen depletion levels. One major advance is facilitated by use of a larger cone heater in the apparatus which gives a uniform heat flux over the whole surface area of a much larger (150 x 150mm specimen). ISO 5660 and ASTM require that the "The irradiance shall be uniform within the central 50mm x 50mm area of the exposed specimen surface, to within ± 2%". The larger cone-shaped radiant electric heater gives a uniform irradiance across the **whole of the** a 150mm x 150mm sample to within 1.89%.

Thermal mapping of the areas under the cone heater has shown that the whole zones are considerably more thermally uniform and that best baseplate – specimen range for uniformity of heat flux across the specimen surface is approx. 60mm. This gives added advantage to this system when testing distorting or intumescing specimens as they can be more easily accommodated within this geometry whilst deforming

The larger cone can be readily accommodated within the existing cone calorimeter geometries and constitutes a simple modification

INTRODUCTION

Non-combustibility has traditionally been used in building regulations in several countries and this has been assessed using tests similar to EN ISO 1182: 2002[4].The heat of combustion as determined in bomb calorimetry, EN ISO 1716: 2002[5] has also been used.

The exposure conditions in the Non-combustibility test and in the bomb calorimeter are both unrealistic and not representative of what happens in a fire. Both tests use very small sample sizes and cannot accommodate complex (laminated) or painted specimens. Neither test takes into account the dynamic nature and growth of a fire hazard or measures the HRR. The limitations of these test methods have lead to the realization that in applications where a materials' low level of combustibility is needed the parameter that should be measured is the HRR. The Cone Calorimeter is widely accepted as the most appropriate apparatus for this application.

In the early 1990s, NIST (USA); BASF(Germany); and Forintek (Canada) performed a programme examining the HRR behaviour of an assortment of specimens, which were then known to be, or not to be, acceptable to building codes as 'non-combustible'. The Forintek results[6] suggested that cone calorimeter testing at an irradiance of 50 kW/m^2 (horizontal) could rate products correctly. They used limits of peak $\dot{q}''$ < 80kW/m^2 and a heat content < 8 MJ/m^2 Further work was done in 1997 led by Urbas and Janssens [7] found that the Cone Calorimeter was suitable for measuring heat release rate from materials and products with low heat content though none of the materials they investigated were classed as 'non-combustible' by the more established tests.

More recently the Cone Calorimeter has been accepted as a regulatory tool in Japan and Canada for assessing the limited combustibility of building materials based on heat release measurements. ISO/TC92/SC1/WG5 has started work developing a test method for limited combustibility which stalled because it utilised the larger product testing initially reported by Grayson [3] et al because the specimens were exposed to a none uniform heat flux exposure. This paper describes the subsequent development of a larger cone heater system which can be substituted within the ISO 5660/ ASTM 1354 system to overcome this shortfall and will allow low levels of heat release to be confidently measured at these levels.

INHERENT NOISE AND DRIFT ISSUES AND THEIR EFFECT ON SIGNAL : NOISE RATIO

The Japanese regulations requires that a Cone Calorimeter test be conducted at 50 kW/m^2 in accordance with ISO 5660-1 and that the peak HRR and THR be calculated at 5 minutes and/or 20 minutes exposure. The results at 5 minutes are for "low grade flammability materials" and the results at 20 minutes for "high grade flammability materials". The criteria limits of the test are that peak HRR must not exceed 200 kW/m^2 for longer than 10 seconds and THR must be less than 8 MJ/m^2 over 20 minutes from the start of the test. The analyser specifications outlined in ISO 5660-1 can lead to "allowable" errors that constitute a significant fraction of the allowable performance levels. Though laboratories with very good protocols and high sensitivity analysers can meet these standards others are struggling to do so.

These errors are usually a function of the inherent noise and drift performance of the analysers. However, when working at this level of sensitivity, laboratory practise, testing protocols especially maintenance of desiccant procedures etc. need to be adhered to and/or modified to reduce drift in particular. We previously described [3] how the ISO 5660-1 oxygen analyser specification allows a drift of not more than 50 parts per million of oxygen over a period of 30 min, and a noise of not more than 50 parts per million of oxygen during this 30 min period and we explained and that analysers

operating at the limits of this performance would lead to errors in HRR measurement of 1.0 MJ/m^2 if the drift was linear, and up to, 3.2 MJ/m^2 under an extreme step change of 50ppm

In addition to inherent analyser drift and noise levels, further drifting may occur from poor operational maintenance or poor testing protocols.

METHODS OF IMPROVING THE RESOLUTION AND MEASUREMENT

With so little margin between the performance requirements and the sensitivity of inherent errors in the ISO 5660 system there is need for significant improvement, both to the apparatus and the procedures used when measuring low heat release rates. These are specifically

Reduction in analyser drift
Reduction in analyser noise
Improved laboratory practice
Increasing the signal at the oxygen analyser (ie making the oxygen depletion bigger)

Reducing Drift

All analysers drift. This is a function of the analyser electronics, the gas sampling system, the sample gas itself, pressure (in the gas sample line and atmosphere), temperature etc. Analyser manufacturers are able to produce consistently lower drift analysers at a premium, i.e. temperature controlled and pressure compensated cells, which will bring them within the given tolerance but if the gas sampling system or the sample gas itself are not monitored the baseline oxygen concentration will eventually drift.



Figure 1 : High performance ISO 5660-1 analyser

Figure 1 shows a ISO 5660-1 compliant high performance oxygen analyser operating with a noise level of 10.7ppm and a drift of 15ppm. This could lead to a potential analyser induced error of 0.13MJ/m^2 in results. This is only 1.6% of the Japanese 8 MJ/m^2 limit. Even such an analyser would exhibit further drift if the laboratory protocols outlined below were not adhered to.

Reducing Noise

The primary sources of noise are the oxygen analyser and the differential pressure measurement taken across the orifice. The noise from the oxygen analyser is a function of the oxygen cell, the electronics in the analyser, and the electronic time constant of the analyser which in turn affects its response time. (Consequently there is a balance between noise and response time, typically the quicker the response time the larger the noise.) The differential pressure around the orifice is turbulent and produces a noisy signal. However, electrical damping of the signal would reduce the effect this has on the HRR.

Improve Laboratory Practice

Laboratory practices and calibrations described in ISO 5660-1 need to be astringently adhered to and maintained at their highest levels when testing for low heat release measurement. Ensure that regular calibrations are made and that any of the influences that particularly lead to drift are minimised

Not removing all the water vapour from the gas sample is perhaps the largest source of drift. This is normally a function of poor maintenance of moisture traps and/or drying desiccants or resultant of the filter system becoming saturated with soot and restricting the flow beyond the pressure compensation capability of the analyser. In addition, systems are fitted with pressure and flow regulation instrumentation (e.g. pressure relief valve) which, if not operating correctly, may be an additional source of drift and noise.

Another common cause of drift is due to the ambient oxygen concentration actually changing in the immediate vicinity of the Cone Calorimeter. This can be as a result of other oxygen consuming experiments being operated simultaneously with the experiment or simply the oxygen consumption and carbon dioxide generation by a group of spectators close to the apparatus situated in a confined space.

Increasing the signal

Increasing the level of oxygen depletion measured for the same material whilst not affecting the noise or drift, would increase the signal to noise ratio and hence reduce the effect of noise and drift. This is the development most likely to facilitate better measurements and can be achieved by can be achieved by changing any or all of the following: -

- Using Lower Flow Rates Through The Duct

The ISO 5660-1 flow rate used in the Cone Calorimeter is 24 l/s. This was found to be sufficient to remove all combustion products without increasing the rate of combustion of the specimen. The duct and orifice diameter were designed to accommodate this flow rate. The combustion gases from less combustible materials could be collected using a lower flow rate. The limit to reducing the flow is when it becomes none turbulent. This is at a flow rate of approximately 10 l/s. This could be reduced further if a smaller diameter duct and orifice plate is fitted. We earlier reported[3] successful reduction of standard cone calorimeter duct flows to 12.5 l/s and are now recommending that this be adopted in the developing standards for low heat release rate measurement.

- Testing at higher heat fluxes

Materials generally give off more heat when tested at higher heat fluxes. Although there has been considerable debate about whether to use a heat flux of 50kW/m^2 or 75 kW/m^2 within ISO TC92, the higher heat flux would be a better measurement choice as the specimen is likely to have a higher HRR

in turn increasing the level of oxygen depletion. Any increase in heat flux would require this to be taken into consideration in any existing regulations (e.g. the Japanese).

- Using Larger Specimens

If a specimen size was increased then the level of oxygen depletion and the signal would be increased proportionately. A specimen measuring 150 mm × 150mm should give a signal 2.25 times bigger than the standard 100mm × 100mm specimen. This was part of the approach being studied in ISO TC 92/SC1/WG5 to develop the standard 'Determination of Low Level of Combustibility using an Oxygen Consumption Calorimeter (Cone Calorimeter)'.

One disadvantage of using larger specimens with the ISO 5660-1 cone heater is that the larger specimen would not experience the same uniform heat flux across the surface that we find in standard cone specimens. Figure 2 shows the heat flux levels received at the four corners and centre of both a 100mm × 100mm and a 150mm × 150mm specimen when located 25mm below the cone heater. The heat flux drops by more than 60% at the corners of the larger specimens. Though the same reduction in the heat flux at the corners of the sample would be produced by all cone heaters and the results for the same material should still be both repeatable and reproducible ISO TC92 decided that it was inappropriate to standardise this as TC92 was tasked to develop methods that could be used for fire safety engineering application. This none uniform exposure would prevent the results being used efficiently in models.

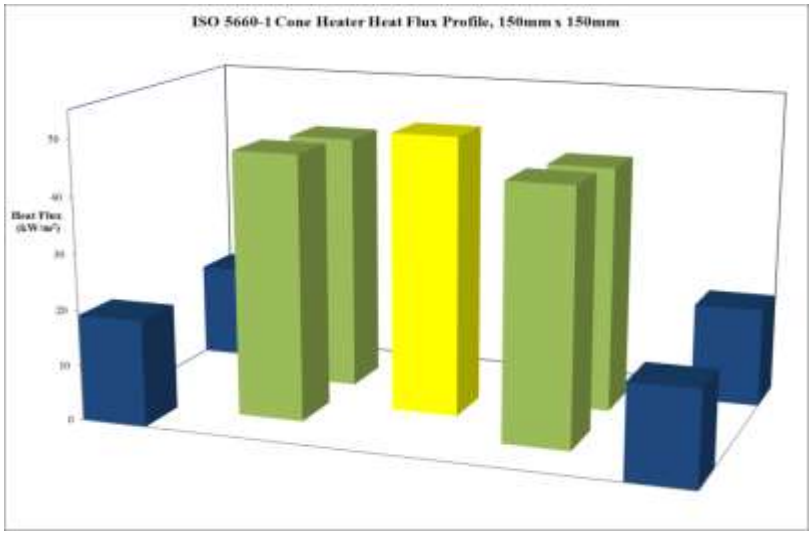


Figure 2: Heat Flux Profile of large and standard specimens with ISO 5660 cone heater

A larger conical heater has now been developed and that can be readily housed in the ISO 5660-1 chassis (see figure 3). This has been tested and shown to deliver a uniformity of performance across the whole surface of this larger 150 x 150 mm specimen that exceeds the uniform surface heat flux requirements specified in ISO 5660-1 and ASTM E1354



Figure 3: Larger format cone heater housed in standard ISO 5660-1

ISO 5660-1 and ASTM E1354 data is widely used for the fire safety engineering applications and both specify an incident specimen surface uniformity from the cone heater such that the heat flux uniformity within the central (50mm × 50mm) area of the exposed specimen surface, be uniform to within ±2%. Extrapolation of these requirements from the specimen size of 100mm square to the larger 150 x150mm specimen, would
require that "the irradiance should be uniform within the central 75mm × 75mm area of the exposed specimen surface, to within ±2%"

Heat flux mapping with the larger cone heater determined the heat flux at the specimen position covariance, for a central 75mm × 75mm and across the full specimen 150mm × 150mm, both for 25 mm and 60mm separations between the cone baseplate and the specimen surface. Results are given in Figure 4 which shows the results for the large cone heater mappings. The large cone far out performs the requirement for the central 50 x 50mm zone of the ISO 5660-1 specimen surface, not only in the 75mm x 75mm central zone, but also over the whole 150mm x 150mm specimen area.

	75mm × 7mm	150mm × 150mm
	25mm separation	
Average (kW/m^2)	50.4	51.0
Standard deviation (kW/m^2)	0.492	0.755
Covariance	0.98%	1.5%
	60mm separation	
Average (kW/m^2)	50.57	50.03
Standard deviation (kW/m^2)	0.543	1.00
Covariance	1.1%	2.0%

Figure 4 Heat Flux Uniformity at 25mm and 60mm

The heat flux profile across the specimen, when measured at 60mm separation between the specimen surface and the cone baseplate, is more typical of the heat flux mapping measured below a standard sized cone calorimeter at 25mm separation. At 25mm separation the heat flux below the large cone increases as the offset from the vertical centre line increases.

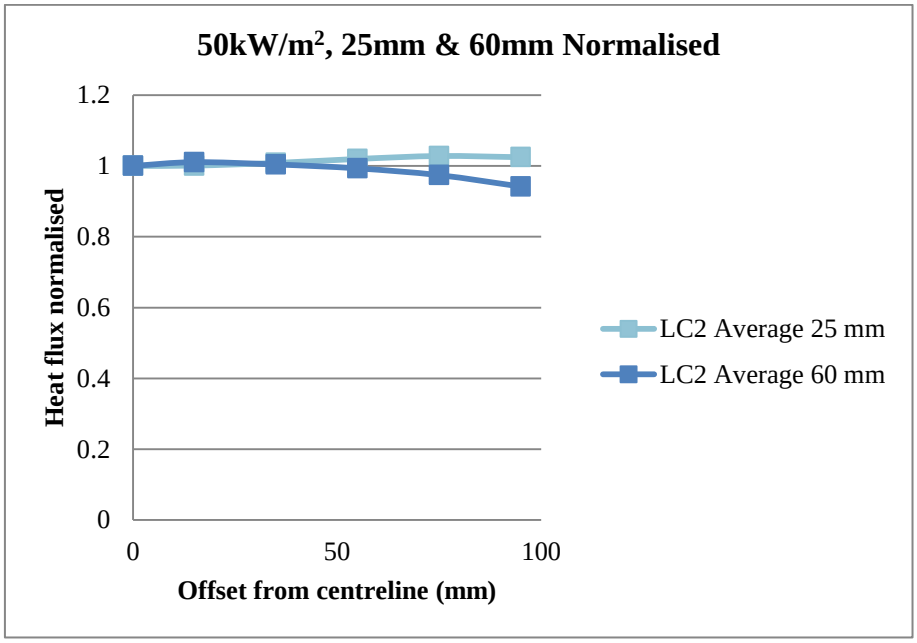


Figure 5. Large format cone heater Heat flux variation across specimen surface for 25mm and 60mm cone base plate – specimen surface separations

Figure 6 and 7 show the heat flux mappings of the larger format cone heater at 60mm and 25mm cone baseplate – specimen surface separations respectively. This can be favourably compared with the mapping with the ISO 5660-1 cone heater in Figure 2. This data shows that the new format heater, not only satisfies the fire safety engineering requirement of ISO 5660-1 but far exceed the

performance of the ISO 5660-1 cone heater in overall uniformity of heat flux delivered. This uniformity is also found over a deeper zone from the cone baseplate which means that thermally mobile materials (i.e. intumescing or collapsing specimens) would be exposed to a more uniform heat flux during their deformed period of the testing.

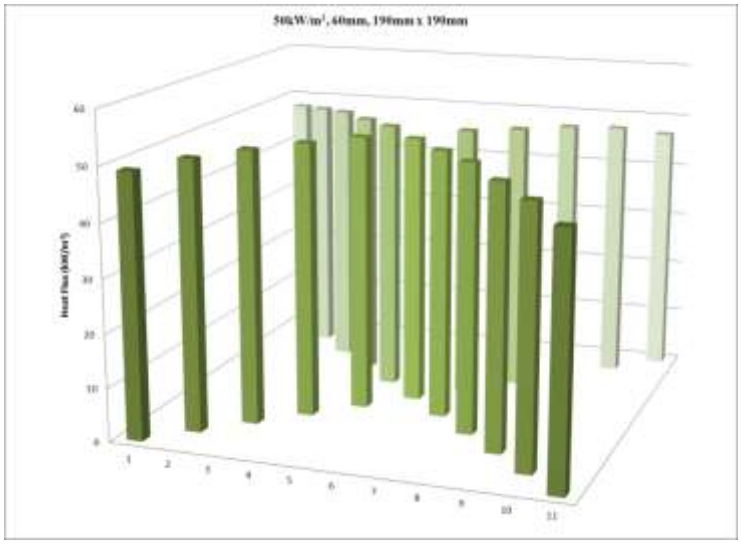


Figure 6: Large cone heater format - Heat flux variation across specimen surface for 60mm cone base plate – specimen surface separation

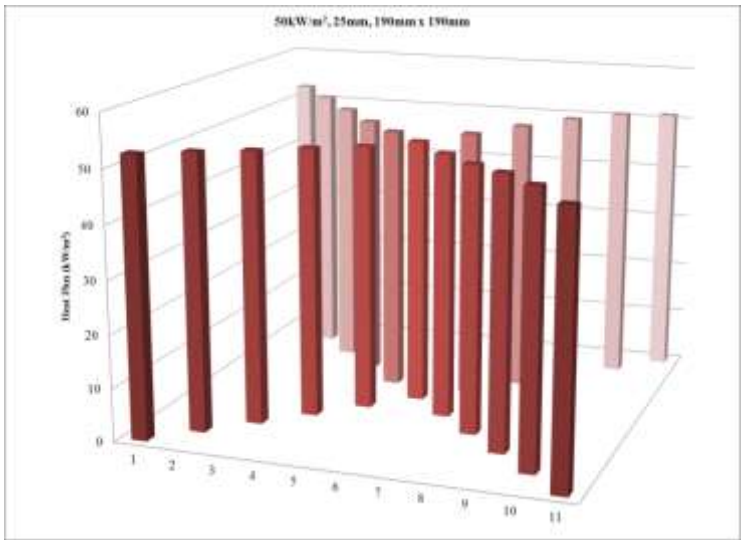


Figure 7: Large cone heater format - Heat flux variation across specimen surface for 25mm cone baseplate – specimen surface separation

The larger cone heater is readily retrofitted to existing cone calorimeters with minor supplementary thermal insulation board being precautionary added to the Chassis Figure 8).

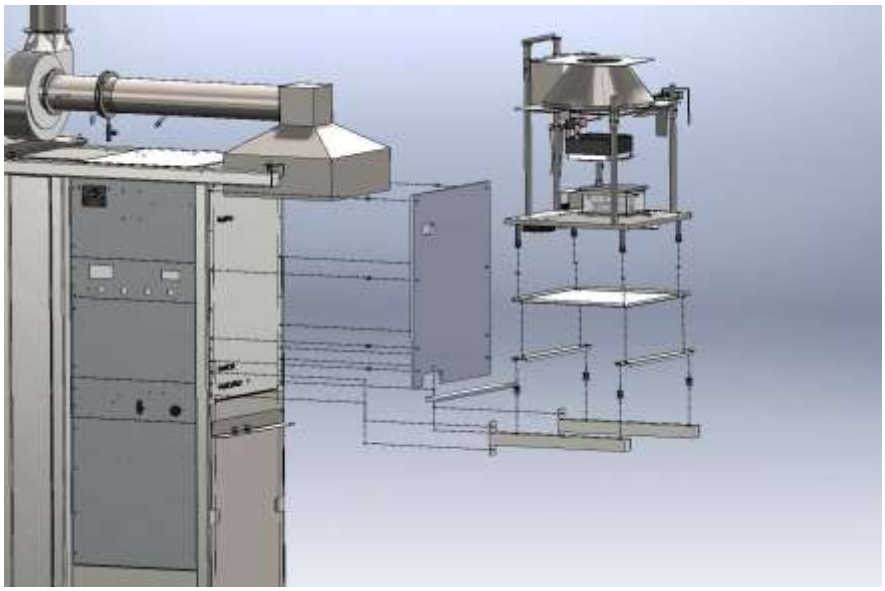


Figure 8: Large cone fitted with to ISO 5660-1 minor modifications

This larger cone heater development along with the use of lower exhausted rates and tighter specifications on the oxygen analysers (30ppm noise and drift) facilitate the basis of a sound standard to measure low heat release rate measurement.

COMPARISON OF RESULTS FROM LARGE AND ISO 5660 CONE HEATERS

A short study was made to compare the performance and results from 100 x 100mm specimens tested using the standard ISO 5660 cone calorimeter and those from 150 x 150 mm specimens tested using the larger format cone heater. All testing was at 50 kW/m^2 . All tests were performed with a sampling interval of 1 s, and a nominal exhaust flow rate of 24 l/s

Plasterboard and a low combustibility ceiling tile were tested as they respectively represented very low heat release materials with a combustible surface layer (ie layered specimens) and a homogenous low heat release specimen.

Figure 9 to12 show the heat release curves of test with the ISO 5660-1 cone and specimens, and those of the larger 150 x 150mm specimens tested with the larger cone heater respectively. Figures 13 and 14 give the tabulated test results of the Average Heat Release Rate over the test time, the Peak heat release rate and the total heat release rate calculated over the test time and also the time intervals 0-300s, 0-600s and 0-1200s. Means Standard deviation and coefficient of variance of each set are also given. These show that the larger and smaller cone formats give similar results when, as in these tests the analysers were well within specifications with minimal drift, and sound laboratory protocols being exacted on the ISO 5660-1 tests. The heat release curves show the much less noisy signals being generated by the larger cone and specimens.

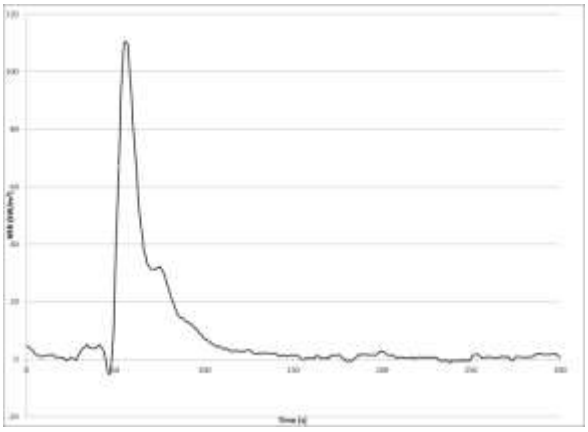


Figure 9 Plaster board tested in Standard ISO 5660-1

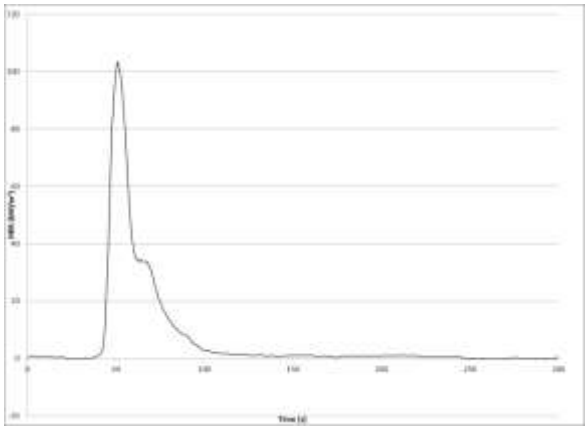


Figure 10 Plaster board tested in Larger Heater &Specimen

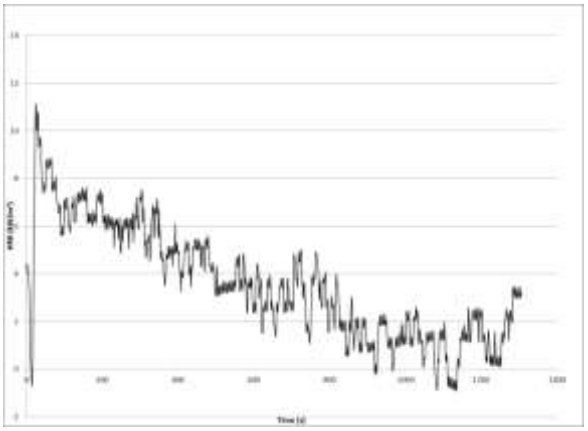


Figure 11 Ceiling Tile tested in Standard ISO 5660-1

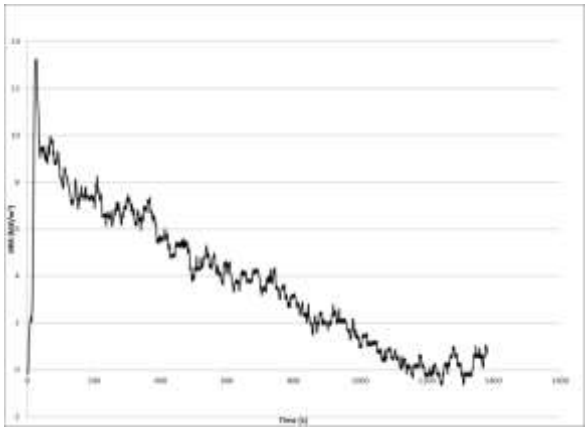


Figure 12 Ceiling Tile tested in Standard ISO 5660-1

Cone				THR (MJ/m^2)			
Size		Mean HRR (kW/m^2)	Peak HRR (kW/m^2)	Test time	0-300s	0-600s	0-1200s
Standard	Test 1	11.63	117.38	3.07	3.42	3.62	4.72
cone	Test 2	8.64	110.51	2.25	2.34	2.51	3.69
100x100	Test 3	9.10	122.98	2.46	2.73	2.77	3.85
	Mean	9.79	116.95	2.59	2.83	2.97	4.09
	STD	1.61	6.25	0.43	0.55	0.58	0.55
	COV	16.43%	5.34%	16.53%	19.33%	19.57%	13.56%
Large	Test 1	7.55	103.51	1.99	2.00	2.04	3.27
cone	Test 2	8.04	129.94	2.15	2.18	2.19	3.20
150x150	Test 3	8.39	119.94	2.26	2.27	2.28	
	Mean	7.99	117.80	2.13	2.15	2.17	3.24
	STD	0.42	13.35	0.14	0.14	0.12	0.05
	COV	5.24%	11.33%	6.54%	6.39%	5.59%	1.53%

Figure 13 Plasterboard tested in Standard ISO 5660-1 and larger heater/specimen set up

Cone				THR (MJ/m^2)			
size		Mean HRR(kW/m^2)	Peak HRR (kW/m^2)	Test time	0-300s	0-600s	0-1200s
standard	Test 1	7.17	13.69	2.15	2.15	3.56	4.38
cone	Test 2	5.35	13.01	3.04	1.97	3.11	3.56
100x100	Test 3	3.57	11.15	4.68	1.98	3.34	4.51
	Test 4	6.18	11.00	2.83	2.11	3.12	3.38
	Mean	5.57	12.21	3.18	2.05	3.28	3.96
	STD	1.53	1.34	1.07	0.09	0.21	0.57
	COV	27.41%	11.00%	33.83%	4.44%	6.50%	14.41%
Large	Test 1	3.99	11.61	3.74	1.98	3.12	3.78
cone	Test 2	3.76	13.26	5.22	2.28	3.89	5.17
150x150	Test 3	3.77	12.76	4.93	2.18	3.65	4.93
	Mean	3.84	12.54	4.63	2.15	3.55	4.63
	STD	0.13	0.84	0.79	0.15	0.39	0.74
	COV	3.42%	6.72%	16.96%	7.12%	11.09%	16.06%

Figure 14 Ceiling Tile tested in Standard ISO 5660-1 and larger heater/specimen set up

CONCLUSION FUTURE DEVELOPMENTS

The larger specimen tested in conjunction with the larger cone heater give similar results to those from high specification ISO 5660-1 cone testing but show stronger signals with much lower noise levels. The later will be of particular value when the specimens are recording heat release very close to the baseline.

Further enhancements are being worked upon and are listed below

- Reducing analyser drift by specifying lower performance requirement
- Testing at higher heat fluxes
- Tightening laboratory practice to remove interfering influences i.e. Minimise ambient oxygen changes during tests; Ensure gas conditioning system is functioning efficiently i.e. all sampling lines are kept dry
- Using lower flow extraction flow rates (12.5 l/s instead of 24 l/s)
- Using larger specimens

Both ISO and ASTM are now developing standards based on this larger format come heater that will facilitate the accurate measurement of low levels of heat release in a cone calorimeter systems by increasing the signal to noise ratio by the listed methods.

REFERENCES

1 'ISO 5660-1: Rate of Heat Release of Building Products (Cone Calorimeter),' International Organisation for Standardisation, Geneva, Switzerland (1992).

2 ASTM Fire Test Standards, 4th edition, ASTM, Philadelphia, PA, 1993, 968-984. 'ASTM E 1354-94: Test method for heat and visible smoke release rates for materials ad products using an oxygen consumption calorimeter.'

3 Gregory,S, Green A., Grayson S.J., Kumar S, Cornelissen A. Use of cone calorimeter for testing materials with low heat release rates. Fire and Materials 2005,63-75 Interscience communications London UK

4 Reaction to fire tests for building products – Non-combustibility test (EN ISO 1182: 2002).

5 Reaction to fire tests for building products - Determination of the heat of combustion (EN ISO 1716: 2002).

6 Babrauskas, V., J. Urbas and L. Richardson, 'Related Quantities. Part E. Non-Combustibility', Chapter 8 in *Heat Release in Fires*, Elsevier Applied Science, NY, Babrauskas, V.; Grayson, S. J., Editors, pp. 257-264, 1992.

7 Janssens, M., K Carpenter, 'Using Heat Release Rate to Assess Combustibility of Building Products in the Cone Calorimeter'. DRAFT –Submitted to Fire Technology – 11/04. Department of Fire Technology, Southwest Research Institute, USA.
.

Public Input No. 115-NFPA 101-2015 [New Section after 4.6.14.5]

4.6.15 Fire-Retardant-Treated Wood. Fire retardant–treated wood shall be a wood product impregnated with chemical by a pressure process or impregnated with chemical by other means during manufacture meeting the requirements in 4.6.15.1 through 4.6.15.6 [**703:** 4.1.1]

4.6.15.1 Fire retardant-treated wood shall be tested in accordance with ASTM E 84, or ANSI/UL 723. [**703:** 4.1.1.1]

4.6.15.2 Fire retardant-treated wood shall have a listed flame spread index of 25 or less. [**703:** 4.1.1.2]

4.6.15.3 Fire retardant-treated wood shall not show evidence of significant progressive combustion when the test is continued for an additional 20-minute period. [**703:** 4.1.1.3]

4.6.15.4 The flame front shall not progress more than 10.5 ft (3.2 m) beyond the centerline of the burners at any time during the test. [**703:** 4.1.1.4]

4.6.15.5 For wood products manufactured using a means other than a pressure process, all sides of the wood product shall be tested in accordance with and produce the results required in 45.5.16.1.1 through 45.5.16.1.4. [**5000:** 45.5.16.1.5]

4.6.15.6 Wood structural panels shall be permitted to test only the front and back faces. [**703:** 4.1.1.6]

4.6.16 Fire-Retardant-Treated Wood Treatment [**703:** 4.1.2]

4.6.16.1 Pressure Process. For wood products impregnated with chemicals by a pressure process, the process shall be performed in closed vessels under gauge pressures not less than 50 psi (345 kPa). The treatment shall provide permanent protection to all surfaces of the wood product. [**703:** 4.1.2.1]

4.6.16.2 Other Means During Manufacture. For wood products impregnated with chemicals by other means during manufacture, the treatment shall be an integral part of the manufacturing process of the wood product. The treatment shall provide permanent protection to all surfaces of the wood product. [**703:** 4.1.2.2]

4.6.16.3 Wood Structural Panels. Adjustment to design values for wood structural panels shall be in accordance with the following:

(1) The effect of the treatment, the method of redrying after treatment, and the exposure to high temperatures and high humidities on the flexure properties of fireretardant-treated softwood plywood shall be determined in accordance with ASTM D 5516, *Standard Test Method for Evaluating the Flexural Properties of Fire-Retardant-Treated Softwood Plywood Exposed to Elevated Temperatures* .

(2) The test data developed by ASTM D 5516 shall be used to develop adjustment factors or maximum loads and spans, or both, for untreated plywood design values in accordance with ASTM D 6305, *Standard Practice for Calculating Bending Strength Design Adjustment Factors for Fire-Retardant-Treated Plywood Roof Sheathing* .

(3) Each manufacturer shall publish the allowable maximum loads and spans for service as floor and roof sheathing for their treatment. [**5000:** 45.5.16.2.2.1]

4.6.16.4 Lumber. Adjustment to design values for lumber shall be in accordance with the following:

(1) For each species of wood treated, the effect of the treatment, the method of redrying after treatment, and the exposure to high temperatures and high humidities on the allowable design properties of fire-retardant-treated lumber shall be determined in accordance with ASTM D5664, *Standard Test Method for Evaluating the Effects of Fire-Retardant Treatments and Elevated Temperatures on Strength Properties of Fire-Retardant-Treated Lumber* .

(2) The test data developed by ASTM D 5664 shall be used to develop modification

factors for use at or near room temperature and at elevated temperatures and humidity in accordance with ASTM D 6841, *Standard Practice for Calculating Design Value Treatment Adjustment Factors for Fire-Retardent-Treated Lumber* .

(3) Each manufacturer shall publish the modification factors for service at ambient temperatures of up to 100°F (37.8°C) and for service as roof framing.

(4) The roof framing modification factors shall take into consideration the climatological location. [5000: 45.5.16.2.2.2]

4.6.16.5 Exposure to Weather or Damp or Wet Locations.

Where fire-retardant-treated wood is exposed to weather or damp or wet locations, it shall be identified as "exterior" to indicate that there is no increase in the listed flame spread index when subjected to ASTM D 2898. *(See 3.3.686.1, Fire-Retardant-Treated Wood.)* [5000: 45.5.16.3]

4.6.16.6 Interior Applications. Interior fire-retardant-treated wood shall have a moisture content of not over 28 percent when tested in accordance with the procedures of ASTM D 3201, *Standard Test Method for Hygroscopic Properties of Fire-Retardant-Wood and Wood-Based Products* , at 92 percent relative humidity. Interior fire-retardant-treated wood shall be tested in accordance with 4.5.16.3 or 4.6.16.4. [5000: 45.5.16.4]

4.6.16.7 Moisture Content. Fire-retardant-treated wood shall have a moisture content of 19 percent or less for lumber and 15 percent or less for wood structural panels before use. For wood kiln dried after treatment (KDAT), the kiln temperatures shall not exceed the temperatures used in drying the lumber and plywood submitted for the testing described in 4.5.16.3 or 4.6.16.4. [5000: 45.5.16.5]

Renumber remaining sections.

Statement of Problem and Substantiation for Public Input

Fire retardant-treated wood is defined but the requirements for the material is not contained in the code. The definition prior to the change last cycle did contain some of the testing requirements. The new definition does not. This change will give the user the information needed to insure the material meets the intent of the code for FRTW.

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Submittal Date: Wed Jun 03 11:40:49 EDT 2015

Public Input No. 239-NFPA 101-2015 [Section No. 6.1.5.1]

6.1.5.1 * Definition — Health Care Occupancy.

An occupancy used to provide medical or other treatment or care ~~simultaneously~~ to ~~four~~ one or more ~~patients on an~~ patients an inpatient basis, where such patients are mostly incapable of self-preservation due to age, physical or mental disability, or because of security measures not under the occupants' control.

Statement of Problem and Substantiation for Public Input

The proposed change is consistent with a modification proposed by CMS in the NPRM to adopt the 2012 Edition of NFPA 101. The intent of the CMS modification is to see that basic requirements are established to assure a core level of safety and quality for all patients, regardless of where the health care services are provided. CMS believes that patients in small facilities should be assured the same level of fire safety as those in larger facilities.

Although this Public Input has been submitted for consistency with the CMS NPRM, personally I do not agree with the proposed change. While the requirements of NFPA 99 regarding equipment and systems should, and do, apply regardless of the number of patients, the requirements of NFPA 101 should not apply to facilities in which less than four patients are incapable of self-preservation. If the Public Input results in a First Revision, there are some single family dwelling and apartments that will need to be classified as a health care occupancy.

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Public Input No. 381-NFPA 101-2015 [Section No. 6.1.6.1]

6.1.6.1 * Definition — Ambulatory Health Care Occupancy.

An occupancy used to provide services or treatment simultaneously ~~to four~~ to one or more patients that provides, on an outpatient basis, one or more of the following:

(1) Treatment for patients that renders the patients incapable of taking action for self-preservation under emergency conditions without the assistance of others

(2) Anesthesia that renders the patients incapable of taking action for self-preservation under emergency conditions without the assistance of others

(3) Emergency or urgent care for patients who, due to the nature of their injury or illness, are incapable of taking action for self-preservation under emergency conditions without the assistance of others

Statement of Problem and Substantiation for Public Input

The proposed change is consistent with a modification proposed by CMS in the NPRM to adopt the 2012 Edition of NFPA 101. The intent of the CMS modification is to see that basic requirements are established to assure a core level of safety and quality for all patients, regardless of where the health care services are provided. CMS believes that patients in small facilities should be assured the same level of fire safety as those in larger facilities.

Although this Public Input has been submitted for consistency with the CMS NPRM, personally I do not agree with the proposed change. While the requirements of NFPA 99 regarding equipment and systems should, and do, apply regardless of the number of patients, the requirements of NFPA 101 should not apply to facilities in which less than four patients are incapable of self-preservation. If the Public Input results in a First Revision, there are some medical office areas that will need to be classified as an ambulatory health care occupancy.

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Public Input No. 395-NFPA 101-2015 [Section No. 6.1.13.2]

6.1.13.2 ~~Other. (Reserved~~ Student Residence Facilities (Student Living Centers)

Statement of Problem and Substantiation for Public Input

This is a continuation of a series of proposals begun in the 2012 revision cycle to identify in this Reserved heading a common occupancy class -- common on most college and university campuses -- that is distinct from Hotels & Dormitories (Chapters 28/29) and Apartments (Chapter 30/31). We have parallel proposals regarding student residenc facilities on the agenda of the International Building Code technical committees. To summarize our claim that student residence facilities (student living centers) are an occupancy class distinct from hotels, dormitories and apartments. A partial list of distingushing characteristics are as follows:

1. Behavioral characteristics of the occupants
2. Unpredictable numbers of occupants in a student residence room
3. Multiple use of student residence facilities for summer athletic programs or the general public
4. K-12 student residence occupancy characteristics are different than above K-12.
5. The likelihood fire alarm system nuisance alarms
6. How false alarms and actual fire events are counted.
7. Coverage and nature of fire and smoke detection and alarm systems
8. Automatic sprinkler ordinances
9. The unpredictable presence of hazardous contents such as space heaters and high-wattage halogen lamps
10. Ad hoc use of high wattage portable cooking appliances,
11. Existence of open flames,
12. Architectural and furniture materials
13. Occupants susceptibility to arson and suicide attempt
14. Student residence facilities with historical significance that present special problems for life safety infrastructure design and construction,
15. Reporting requirements under the Cleary Act
16. Location and number of fire extinguishers
17. Fire separation issues: Of classroom space and sleeping areas, for example. Implications for smoke and fire control openings, fire ratings, etc.

18. Location and number of elevators. The travel distance and orientation with entry and exits. Correlating modifications of ASME A17.1

19. Windows that reconcile the competing requirements of energy efficiency, safety and comfort and the desire for fresh air and light.

20. Standby power systems for food and plumbing safety

21. Arc-fault circuit interrupters for branch circuit wiring

22. Occupancy during partial outages. How can they be designed for partial operation without violating local occupancy rules?

23. Central and distributed kitchens and kitchenettes.

24. Economic considerations of for-profit players in the student residence facilities space (e.g. Education Realty Trust Inc) looking for recession-proof assets.

25. Cost of housing facilities relative to total cost of higher education

26. Security lighting for perimeter and access points

27. Location, site characteristics, and proximity to central instruction campus.

28. Metering to shift utility costs to residents

29. Waste management

30. Security and surveillance

31. Aligning O&M with property and life safety issues.

A more complete description of how we are trying to get these safety and sustainability concepts moving together is summarized on our web site:

http://standards.plantops.umich.edu/nfpa-101-chapters-14-15-education-facilities/

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Public Input No. 97-NFPA 101-2015 [Section No. 6.2.2.1]

6.2.2.1* General.
The hazard of contents of any building or structure shall be classified as low, ordinary, or high in accordance with 6.2.2.2, 6.2.2.3, and 6.2.2.4.

Additional Proposed Changes

File Name	Description	Approved
A.6.2.2.1.docx	Proposed revisions to Annex A.6.2.2.1	

Statement of Problem and Substantiation for Public Input

This Public Input is submitted on behalf of the Hazardous Materials Task Group. The Life Safety Code Correlating Committee appointed the Hazardous Materials Task Group to review hazardous materials provisions within the code and provide a recommendation. This Task Group included representative membership from the Life Safety Code core and occupancy chapters. The Task Group agreed that a gap existed and ultimately recommended additional provisions to more comprehensively address hazardous materials within the Life Safety Code. The agreed set of recommendations include revisions to the following sections: 1.1.5, 4.1.3, 4.2.3, 6.2.2, 7.12, 8.7.3 A.1.1.5, A.4.1.3, A.4.2.3, A.6.2.2.1, A.7.12, A.8.7.3, and new Annex C. The majority of the revisions reference existing NFPA standards, rather than create new technical requirements within the code. Scoping sections for these standards are reproduced within a new Annex C to provide guidance. Revisions to Annex Section A.6.2.2.1 are provided for clarity.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 94-NFPA 101-2015 [New Section after 1.1.4]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 95-NFPA 101-2015 [New Section after 4.1.2]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 96-NFPA 101-2015 [New Section after 4.2.2]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 98-NFPA 101-2015 [New Section after 7.11.6]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 99-NFPA 101-2015 [Section No. 8.7.3]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 100-NFPA 101-2015 [New Section after B.4]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 94-NFPA 101-2015 [New Section after 1.1.4]	
Public Input No. 95-NFPA 101-2015 [New Section after 4.1.2]	
Public Input No. 96-NFPA 101-2015 [New Section after 4.2.2]	

Public Input No. 98-NFPA 101-2015
[New Section after 7.11.6]

Public Input No. 99-NFPA 101-2015
[Section No. 8.7.3]

Public Input No. 100-NFPA 101-2015
[New Section after B.4]

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A.6.2.2.1 These classifications do not apply to the application of sprinkler protection classifications. See NFPA 13. Depending on the use of the space, the area might require special hazard protection in accordance with Section 8.7.

Also, these classifications do not apply to the application of hazardous materials classifications within NFPA 400. NFPA 101 primarily classifies hazards based on fire severity. NFPA 400 regulates contents through a different classification system, which takes into consideration physical hazards, health hazards, quantities, storage conditions, and use conditions.

See 4.1.3 and Annex C for referenced documents on hazardous materials.

Public Input No. 18-NFPA 101-2015 [New Section after 11.8.2.2]

11.8.2.3 All new vertical exit enclosures shall be smokeproof enclosures in accordance with 7.2.3.

Additional Proposed Changes

File Name	Description	Approved
101_PC10.pdf	NFPA 101 Public Comment No. 10	✓

Statement of Problem and Substantiation for Public Input

NOTE: The following Public Input appeared as “Reject but Hold” in Public Comment No.10 of the A2014 Second Draft Report for NFPA 101 and per the Regs. at 4.4.8.3.1.

Evacuation times in high-rise buildings are often greatly extended, often making use of staged evacuations, or protect in place procedures for non-fire floors. It is imperative that exit stairway enclosures are adequately protected from smoke to ensure the safety of occupants on floors above the fire.

The NIST fire report on the Cook County Administration Building fire demonstrated that had the building’s stairwell entry smoke evacuation system (which was not even properly designed) been working the spread of smoke into the stairwell would have been reduced.

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Public Comment No. 10-NFPA 101-2013 [New Section after 11.8.3.2]

11.8.2.3 All new vertical exit enclosures shall be smokeproof enclosures in accordance with 7.2.3.

Statement of Problem and Substantiation for Public Comment

Evacuation times in high-rise buildings are often greatly extended, often making use of staged evacuations, or protect in place procedures for non-fire floors. It is imperative that exit stairway enclosures are adequately protected from smoke to ensure the safety of occupants on floors above the fire.

The NIST fire report on the Cook County Administration Building fire demonstrated that had the building's stairwell entry smoke evacuation system (which was not even properly designed) been working the spread of smoke into the stairwell would have been reduced.

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Committee Statement

Committee Action: Rejected but held
Resolution: This change was not introduced during the First Draft meeting and is considered new material.

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Public Input No. 242-NFPA 101-2015 [New Section after 11.11.6.2.3]

11.12 Animal Housing Facility

11.12.1 The provisions of Section 11.1 shall apply.

11.12.1.2 In addition to the applicable requirements in this *Code* , the requirements for human life safety outlined in NFPA 150, *Standard for Fire and Life Safety in Animal Housing Facilities* , shall also apply.

Statement of Problem and Substantiation for Public Input

Animal Housing Facilities are currently unrecognized and unaddressed in The Life Safety Code. A proposal to add a new occupancy type to address these facilities was declined during the last revision cycle. As such, the Standards Council made a suggestion during the Appeals process to review the possibility of adding this facility to the Special Structures chapter. This inclusion addresses the need to apply both documents to the life safety needs of humans who work in animal housing facilities as both documents address human life safety.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 240-NFPA 101-2015 [New Section after 3.3.18]	Definition provided

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Public Input No. 449-NFPA 101-2015 [New Section after 43.10.5.9]

Adult Foster Homes

(1) GENERAL CONDITIONS.

(a) INTERIOR AND EXTERIOR PREMISES. The building and furnishings, patios, decks, and walkways, as applicable, must be clean and in good repair. The interior and exterior premises must be well maintained and accessible according to the individual needs of the residents. There must be no accumulation of garbage, debris, rubbish, or offensive odors. Walls, ceilings, and floors must be of such character to permit washing, cleaning, or painting, as appropriate.

(b) ADDRESS. The address numbers of the adult foster home must be placed on the home in a position that is legible and clearly visible from the street or road fronting the property. Address numbers must be a minimum of 4 inches in height, made of reflective material, and contrast with their background.

(c) LIGHTING. Adequate lighting, based on the needs of the occupants, must be provided in each room, stairway, and exit way. Incandescent light bulbs and florescent tubes must be protected with appropriate covers.

(d) TEMPERATURE. The heating system must be in working order. Areas of the home used by the residents must be maintained at a comfortable temperature. Minimum temperatures during the day must be not less than 68 degrees, no greater than 85 degrees, and not less than 60 degrees during sleeping hours. Variations from the requirements of this rule must be based on resident care needs or preferences and must be addressed in each resident's care plan.

(A) During times of extreme summer heat, the licensee must make reasonable effort to keep the residents comfortable using ventilation, fans, or air conditioning. Precautions must be taken to prevent resident exposure to stale, non-circulating air.

(B) If the facility is air-conditioned, the system must be functional and the filters must be cleaned or changed as needed to ensure proper maintenance.

(C) If the licensee is unable to maintain a comfortable temperature for the residents during times of extreme summer heat, air conditioning or another cooling system may be required.

(e) COMMON USE AREAS. Common use areas for the residents must be accessible to all residents. There must be at least 150 square feet of common living space and sufficient furniture in the home to accommodate the recreational and socialization needs of all the occupants at one time. Common space may not be located in an unfinished basement or garage unless such space was constructed for that purpose or has otherwise been legalized under permit. There may be additional space required if wheelchairs are to be accommodated. An additional 40 square feet of common living space is required for each day care individual, room and board tenant, or relative receiving care for remuneration that exceeds the limit of five.

(f) VIDEO MONITORS. Use of video monitors detracts from a home-like environment and the licensee may not use video monitors in any area of the home that would violate a resident’s privacy unless requested by the resident or the resident's legal representative. The licensee may not ask the resident or the resident's legal representative to waive the resident’s right to privacy as a condition of admission to the home.

(2) SANITATION AND PRECAUTIONS.

(a) NON-MUNICIPAL WATER SOURCE. A public water supply must be utilized if available. If a non-municipal water source is used, the licensor, a sanitarian, or a technician from a certified water-testing laboratory must collect a sample annually or as required by the Department. The water sample must be tested for coliform bacteria. Water testing and any necessary corrective action to ensure water is suitable for drinking must be completed at the licensee's expense. Water testing records must be retained for three years.

(b) Septic tanks or other non-municipal sewage disposal systems must be in good working order.

(c) COMMODES AND INCONTINENCE GARMENTS. Commodes used by residents must be emptied frequently and cleaned daily, or more frequently if necessary. Incontinence garments must be disposed of in closed containers.

(d) WATER TEMPERATURE. A resident who is unable to safely regulate the water temperature must be supervised.

(e) LAUNDRY. Prior to laundering, soiled linens and clothing must be stored in closed containers in an area that is separate from food storage, kitchen, and dining areas. Pre-wash attention must be given to soiled and wet bed linens. Sheets and pillowcases must be laundered at least weekly and more often if soiled.

(f) Garbage and refuse must be suitably stored in readily cleanable, rodent-proof, covered containers, pending weekly removal.

(g) VENTILATION. All doors and windows that are used for ventilation must have screens in good condition.

(h) INFECTION CONTROL. Standard precautions for infection control must be followed in resident care. Hands and other skin surfaces must be washed immediately and thoroughly if contaminated with blood or other body fluids.

(i) DISPOSAL OF SHARPS. Precautions must be taken to prevent injuries caused by needles, scalpels, and other sharp instruments or devices during procedures. After use, disposable syringes and needles, scalpel blades, and other sharp items must be placed in a puncture-resistant, red container for disposal. The puncture-resistant container must be located as close as practical to the use area. Disposal must be made according to local regulations and resources (ORS 459.386 to 459.405).

(j) FIRST AID. Current, basic first-aid supplies and a first-aid manual must be readily available in the home.

(k) PESTS. Reasonable precautions must be taken to prevent pests (e.g., ants, cockroaches, other insects, and rodents).

(l) PETS OR OTHER ANIMALS. Sanitation for household pets and other domestic animals on the premises must be adequate to prevent health hazards. Proof of rabies vaccinations and any other vaccinations that are required for the pet by a licensed veterinarian must be maintained on the premises. Pets not confined in enclosures must be under control and not present a danger to the residents or guests.

(m) SAFETY BARRIERS. Patios, decks, walkways, swimming pools, hot tubs, spas, saunas, water features, and stairways, as appropriate, must be equipped with safety barriers designed to prevent injury. Resident access to or use of swimming or other pools, hot tubs, spas, or saunas on the premises must be supervised.

(3) BATHROOMS. Bathrooms must:

(a) Provide individual privacy and have a finished interior with a door that opens to a hall or common-use room. If a bedroom includes a private bathroom, the door for the private bathroom must open to the bedroom. No person must have to walk through another person's bedroom to access a bathroom;

(b) Be large enough to accommodate the individual needs of the residents and any

equipment that may be necessary;

(c) Have a mirror, a window that opens or other means of ventilation, and a window covering for privacy;

(d) Be clean and free of objectionable odors;

(e) Have bathtubs, showers, toilets, and sinks in good repair. A sink must be located near each toilet and a toilet and sink must be available for the resident's use on each floor with resident rooms. There must be at least one toilet, one sink, and one bathtub or shower for each six household occupants (including residents, day care individuals, room and board tenants, the licensee, and the licensee's family);

(f) Have hot and cold water at each bathtub, shower, and sink in sufficient supply to meet the needs of the residents;

(g) Have nonporous surfaces for shower enclosures. Glass shower doors, if applicable, must be tempered safety glass, otherwise, shower curtains must be clean and in good condition;

(h) Have non-slip floor surfaces in bathtubs and showers;

(i) Have grab bars for each toilet, bathtub, and shower to be used by the residents for safety;

(j) Have barrier-free access to toilet and bathing facilities; and

(k) Have adequate supplies of toilet paper and soap supplied by the licensee. Residents must be provided with individual towels and washcloths that are laundered in hot water at least weekly or more often if necessary. Residents must have appropriate racks or hooks for drying bath linens. If individual hand towels are not provided, roller-dispensed hand towels or paper towels in a dispenser must be provided for the residents' use.

(4) BEDROOMS.

(a) Bedrooms for all household occupants must:

(A) Have been constructed as a bedroom when the home was built, or remodeled under permit;

(B) Be finished with walls or partitions of standard construction that go from floor to ceiling;

(C) Have a door that opens directly to a hallway or common use room without passage through another bedroom or common bathroom. The bedroom door must be large enough to accommodate the occupant of the room and any mobility equipment that may be needed by the resident;

(D) Be adequately ventilated, heated, and lighted with at least one window that opens and meets the requirements in section (5)(e) of this rule;

(E) Be at least 70 square feet of usable floor space for one resident or 120 square feet for two residents excluding any area where a sloped ceiling does not allow a person to stand upright; and

(F) Have no more than two occupants per room. Residents must be limited to five adults who require care and are unrelated to the licensee and resident manager by blood, marriage, or adoption.

(2) The number of residents permitted to reside in an adult foster home is determined by the ability of the staff to meet the care needs of the residents, the fire and life safety standards for evacuation, and compliance with the facility standards of these rules.

(a)Children over the age of five have a bedroom available that is separate from their parents. This rule is not intended to prohibit a child five years of age or younger from occupying their parent's bedroom.

(b) The licensee, any other caregivers, and family members may not sleep in areas

designated as living areas or share a bedroom with a resident. This rule is not intended to prohibit a caregiver or other person of the resident's choosing from temporarily staying in the resident's room when required by the resident's condition.

(c) There must be a bed at least 36 inches wide for each resident consisting of a mattress and springs, or equivalent, in good condition. Cots, rollaways, bunks, trundles, daybeds with restricted access, couches, and folding beds may not be used for residents. Each bed must have clean bedding in good condition consisting of a bedspread, mattress pad, two sheets, a pillow, a pillowcase, and blankets adequate for the weather. Waterproof mattress covers must be used for incontinent residents. Day care individuals may use a cot or rollaway bed if bedroom space is available that meets the requirements of section (4)(a) of this rule. A resident's bed may not be used by a day care individual.

(d) Each resident's bedroom must have separate, private dresser and closet space sufficient for the resident's clothing and personal effects including hygiene and grooming supplies. A resident must be provided private, secure storage space to keep and use reasonable amounts of personal belongings. A licensee may not use a resident's bedroom for storage of items, supplies, devices, or appliances that do not belong to the resident.

(e) Drapes or shades for bedroom windows must be in good condition and allow privacy for the residents.

(f) A resident who is non-ambulatory, has impaired mobility, or is cognitively impaired must have a bedroom with a safe, second exit at ground level. A resident with a bedroom above or below the ground floor must demonstrate their capability for self-preservation.

(g) Resident bedrooms must be in close enough proximity to the licensee or caregiver in charge to alert the licensee or caregiver in charge to resident nighttime needs or emergencies, or the bedrooms must be equipped with a functional call bell or intercom within the residents' abilities to operate. Intercoms may not violate the resident's right to privacy and must have the capability of being turned off by the resident or at the resident's request.

(h) Bedrooms used by the licensee, resident manager, shift caregiver, and substitute caregiver, as applicable, must be located in the adult foster home and must have direct access to the residents through an interior hallway or common use room.

(5) SAFETY.

(a) FIRE AND LIFE SAFETY. Buildings must meet all applicable state and local building, mechanical, and housing codes for fire and life safety. The home may be inspected for fire safety by the State Fire Marshal's Office, or the State Fire Marshal's designee, at the request of the local licensing authority or the Department using the standards in these rules, as appropriate.

(b) HEAT SOURCES. All heating equipment, including but not limited to wood stoves, pellet stoves, and fireplaces must be installed in accordance with all applicable state and local building and mechanical codes. Heating equipment must be in good repair, used properly, and maintained according to the manufacturer's or a qualified inspector's recommendations.

(A) A licensee who does not have a permit verifying proper installation of an existing woodstove, pellet stove, or gas fireplace must have it inspected by a qualified inspector, Certified Oregon Chimney Sweep Association member, or Oregon Hearth, Patio, and Barbeque Association member and follow their recommended maintenance schedule.

(B) Fireplaces must have approved and listed protective glass screens or metal mesh screens anchored to the top and bottom of the fireplace opening.

(C) The local licensing authority may require the installation of a non-combustible,

heat-resistant, safety barrier 36 inches around a woodstove to prevent residents with ambulation or confusion problems from coming in contact with the stove.

(D) Unvented, portable oil, gas, or kerosene heaters are prohibited. Sealed electric transfer heaters or electric space heaters with tip-over, shut-off capability may be used when approved by the State Fire Marshal or the State Fire Marshal's designee. A heater must be directly connected to an electrical outlet and may not be connected to an extension cord.

(c) EXTENSION CORDS AND ADAPTORS. Extension cord wiring and multi-plug adaptors may not be used in place of permanent wiring. UL-approved, re-locatable power taps (RPTs) with circuit breaker protection and no more than six electrical sockets are permitted for indoor use only and must be installed and used in accordance with the manufacturer’s instructions. If RPTs are used, the RPT must be directly connected to an electrical outlet, never connected to another RPT (known as daisy-chaining or piggy-backing), and never connected to an extension cord.

(d) LOCKS AND ALARMS. Hardware for all exit doors and interior doors must be readily visible, have simple hardware that may not be locked against exit, and have an obvious method of operation. Hasps, sliding bolts, hooks and eyes, slide chain locks, and double key deadbolts are not permitted. If a home has a resident with impaired judgment who is known to wander away, the home must have an activated alarm system to alert a caregiver of the resident's unsupervised exit.

(e) WINDOWS. Bedrooms must have at least one window or exterior door that leads directly outside, readily opens from the inside without special tools, and provides a clear opening of not less than 821 square inches (5.7 sq. ft.), with the least dimensions not less than 24 inches in height or 20 inches in width. If the interior sill height of the window is more than 44 inches from the floor level, approved steps or other aids to the window exit that the occupants are capable of using must be provided. Windows with a clear opening of not less than 5.0 square feet or 720 square inches with interior sill heights of no more than 48 inches above the floor may be accepted when approved by the State Fire Marshal or the State Fire Marshal's designee.

(f) CONSTRUCTION. Interior and exterior doorways must be wide enough to accommodate the mobility equipment used by the residents such as wheelchairs and walkers. All interior and exterior stairways must be unobstructed, equipped with handrails on both sides, and appropriate to the condition of the residents. (See also section (5)(q) of this rule)

(A) Buildings must be of sound construction with wall and ceiling flame spread rates at least substantially comparable to wood lath and plaster or better. The maximum flame spread index of finished materials may not exceed 200 and the smoke developed index may not be greater than 450. If more than 10 percent of combined wall and ceiling areas in a sleeping room or exit way is composed of readily combustible material such as acoustical tile or wood paneling, such material must be treated with an approved flame retardant coating. Exception: Buildings supplied with an approved automatic sprinkler system.

(i) MANUFACTURED HOMES. A manufactured home (formerly mobile homes) must have been built since 1976 and designed for use as a home rather than a travel trailer. The manufactured home must have a manufacturer's label permanently affixed on the unit itself that states the manufactured home meets the requirements of the Department of Housing and Urban Development (HUD). The required label must read as follows:

"As evidenced by this label No. ABC000001, the manufacturer certifies to the best of the manufacturer's knowledge and belief that this mobile home has been inspected in accordance with the requirements of the Department of Housing and Urban Development and is constructed in conformance with the Federal Mobile Home Construction and Safety Standards in effect on the date of manufacture. See date plate."

(ii) If such a label is not evident and the licensee believes the manufactured home meets the required specifications, the licensee must take the necessary steps to secure and provide verification of compliance from the home's manufacturer.

(iii) Manufactured homes built since 1976 meet the flame spread rate requirements and do not have to have paneling treated with a flame retardant coating.

(B) STRUCTURAL CHANGES. The licensee must notify the local licensing authority in writing at least 15 calendar days prior to any remodeling, renovations, or structural changes in the home that require a building permit. Such activity must comply with local building, sanitation, utility, and fire code requirements applicable to a single-family dwelling (see ORS 443.760(1)). The licensee must forward all required permits and inspections, an evacuation plan as described in section (5)(k) of this rule, and a revised floor plan as described in section (5)(o) of this rule to the local licensing authority within 30 calendar days of completion.

(g) FIRE EXTINGUISHERS. At least one fire extinguisher with a minimum classification of 2-A:10-B:C must be mounted in a location visible and readily accessible to any occupant of the home on each floor, including basements. Fire extinguishers must be checked at least once a year by a qualified person who is well versed in fire extinguisher maintenance. All recharging and hydrostatic testing must be completed by a qualified agency properly trained and equipped for this purpose.

(h) CARBON MONOXIDE AND SMOKE ALARMS.

(A) CARBON MONOXIDE ALARMS. Carbon monoxide alarms must be listed as complying with ANSI/UL 2034 and must be installed and maintained in accordance with the manufacturer's instructions. Carbon monoxide alarms must be installed within 15 feet of each bedroom at the height recommended by the manufacturer.

(i) If bedrooms are located in multi-level homes, carbon monoxide alarms must be installed on each level including the basement.

(ii) Carbon monoxide alarms may be hard-wired, plug-in, or battery operated. Hard wired and plug-in alarms must be equipped with a battery back-up. Battery operated carbon monoxide alarms must be equipped with a device that warns of a low battery.

(iii) A bedroom used by a hearing-impaired occupant who may not hear the sound of a regular carbon monoxide alarm must be equipped with an additional carbon monoxide alarm that has visual or vibrating capacity.

(B) SMOKE ALARMS. Smoke alarms must be installed in accordance with the manufacturer's instructions in each bedroom, in hallways or access areas that adjoin bedrooms, the family room or main living area where occupants congregate, any interior designated smoking area, and in basements. In addition, smoke alarms must be installed at the top of all stairways in multi-level homes.

(i) Ceiling placement of smoke alarms is recommended.

(ii) Battery operated smoke alarms or hard-wired smoke alarms with a battery backup must be equipped with a device that warns of a low battery.

(iii) A bedroom used by a hearing-impaired occupant who may not hear the sound of a regular smoke alarm must be equipped with an additional smoke alarm that has visual or vibrating capacity.

(C) All carbon monoxide alarms and smoke alarms must contain a sounding device or be interconnected to other alarms to provide, when actuated, an alarm that is audible in all sleeping rooms. The alarms must be loud enough to wake

occupants when all bedroom doors are closed. Intercoms and room monitors may not be used to amplify alarms.

(D) The licensee must test all carbon monoxide alarms and smoke alarms in accordance with the manufacturer’s instructions at least monthly (per NFPA 72). Testing must be

documented in the facility records. The licensee must maintain carbon monoxide alarms, smoke alarms, and fire extinguishers in functional condition. If there are more than two violations in maintaining battery operated alarms in working condition, the Department may require the licensee to hard wire the alarms into the electrical system.

(i) COMBUSTIBLES AND FIREARMS. Flammables, combustible liquids, and other combustible materials must be safely and properly stored in their original, properly labeled containers or safety containers and secured in areas to prevent tampering by residents or vandals.

(A) Oxygen and other gas cylinders in service or in storage must be adequately secured to prevent the cylinders from falling or being knocked over;

(B) No smoking signs must be visibly posted where oxygen cylinders are present;

(C) Firearms must be stored, unloaded, in a locked cabinet. The firearms cabinet must be located in an area of the home that is not accessible to the residents; and

(D) Ammunition must be secured in a locked area separate from the firearms.

(j) HAZARDOUS MATERIALS. Cleaning supplies, medical sharps containers, poisons, insecticides, and other hazardous materials must be properly stored in their original, properly labeled containers in a safe area that is not accessible to residents or near food preparation or food storage areas, dining areas, or medications.

(k) EVACUATION PLAN. An emergency evacuation plan must be developed and revised as necessary to reflect the current condition of the residents in the home. The evacuation plan must be rehearsed with all occupants.

(l) ORIENTATION TO EMERGENCY PROCEDURES. Within 24 hours of arrival, any new resident or caregiver must be shown how to respond to a smoke alarm, shown how to participate in an emergency evacuation drill, and receive an orientation to basic fire safety. New caregivers must also be oriented in how to conduct an evacuation.

(m) EVACUATION DRILL. An evacuation drill must be held at least once every 90 calendar days, with at least one evacuation drill per year conducted during sleeping hours. The evacuation drill must be clearly documented, signed by the caregiver conducting the drill, and maintained according to OAR 411-050-0645.

(A) The licensee and all other caregivers must:

(i) Be able to demonstrate the ability to evacuate all occupants from the facility to the initial point of safety within three minutes or less. The initial point of safety must:

(I) Be exterior to and a minimum of 25 feet away from the structure;

(II) Have direct access to a public sidewalk or street; and

(III) Not be in the backyard of a home unless the backyard directly accesses a public street or sidewalk.

(ii) Be able to demonstrate the ability to further evacuate all occupants from the initial point of safety to the final point of safety within two minutes or less. The final point of safety must:

(I) Be a minimum of 50 feet away from the structure; and

(II) Located on a public sidewalk or street;

(B) Conditions may be applied to a license if the licensee or caregivers demonstrate the inability to meet the evacuation times described in this section. Conditions may include but are not limited to reduced capacity of residents, additional staffing, or increased fire protection. Continued problems are grounds for revocation or non-renewal of the license.

(n) FLOOR PLAN. The licensee must develop a current and accurate floor plan that indicates:

(A) The size of rooms;

(B) Which bedrooms are to be used by residents, the licensee, caregivers, for day care, and room and board tenants, as applicable;

(C) The location of all the exits on each level of the home, including emergency exits such as windows;

(D) The location of wheelchair ramps;

(E) The location of all fire extinguishers, smoke alarms, and carbon monoxide alarms;

(F) The planned evacuation routes, initial point of safety, and final point of safety; and

(G) Any designated smoking areas in or on the adult foster home's premises.

(o) RESIDENT PLACEMENT. A resident, who is unable to walk without assistance or not capable of self-preservation, may not be placed in a bedroom on a floor without a second ground level exit. (See also section (4)(f) of this rule)

(p) STAIRS. Stairs must have a riser height of between 6 to 8 inches and tread width of between 8 to 10.5 inches. Lifts or elevators are not an acceptable substitute for a resident's capability to ambulate stairs. (See also section (5)(f) of this rule)

(q) EXIT WAYS. All exit ways must be barrier free and the corridors and hallways must be a minimum of 36 inches wide or as approved by the State Fire Marshal or the State Fire Marshal's designee. Interior doorways used by the residents must be wide enough to accommodate wheelchairs and walkers if used by residents and beds if used for evacuation purposes. Any bedroom window or door identified as an exit must remain free of obstacles that would interfere with evacuation.

(r) RAMPS. There must be at least one wheelchair ramp from a minimum of one exterior door if an occupant of the home is non-ambulatory. A licensee may be required to bring existing ramps into revised compliance if necessary to meet the needs of new residents or current residents with increased care needs. Wheelchair ramps must comply with the Americans with Disabilities Act (ADA) and must:

(A) Have the least possible slope with a maximum slope of 1 inch rise in each 12 inches of distance;

(B) Have a maximum rise for any run of 30 inches;

(C) Have a minimum clear width of 36 inches;

(D) Have landings with a minimum clear length of 60 inches at the top and bottom of each ramp and each ramp run;

(E) Have handrails on both sides of the ramp if the ramp has a rise of 6 inches or more or a run of 72 inches or more. Handrails must:

(i) Be continuous or must extend 12 inches beyond the top and bottom of the ramp segment;

(ii) Have a clear space of 1 1/2 inches between the handrail and the wall;

(iii) Mounted between 34 and 38 inches above the ramp surface; and

(iv) Rounded at the ends or returned smoothly to the floor, wall, or post.

(F) Have curbs, walls, railings, or projecting surfaces that prevent people from slipping off the ramp if the ramp or landing has a drop off. Curbs must be a minimum of 2 inches high;

(G) Be designed so water does not accumulate on walking surfaces; and

(H) Have non-skid surfaces.

(s) EMERGENCY EXITS. There must be a second safe means of exit from all sleeping rooms. A provider whose sleeping room is above the first floor may be required to

demonstrate at the time of licensure, renewal, or inspection, an evacuation drill from the provider's sleeping room using the secondary exit.

(t) FLASHLIGHT. There must be at least one plug-in, rechargeable flashlight in good functional condition available on each floor of the home for emergency lighting.

(u) SMOKING. If smoking is allowed in a home, the licensee must adopt house policies that restrict smoking to designated areas.

(A) Smoking is prohibited in:

(i) Any bedroom including that of the residents, licensee, resident manager, any other caregiver, occupant, or visitor;

(ii) Any room where oxygen is used; and

(iii) Anywhere flammable materials are stored.

(B) Ashtrays of noncombustible material and safe design must be provided in areas where smoking is permitted.

(v) EMERGENCY PREPAREDNESS PLAN. A licensee must develop and maintain a written emergency preparedness plan for the protection of all occupants in the home in the event of an emergency or disaster.

(A) The written emergency plan must:

(i) Include an evaluation of potential emergency hazards including but not limited to:

(I) Prolonged power failure or water or sewer loss;

(II) Fire, smoke, or explosion;

(III) Structural damage;

(IV) Hurricane, tornado, tsunami, volcanic eruption, flood, or earthquake;

(V) Chemical spill or leak; and

(VI) Pandemic.

(ii) Include an outline of the caregiver's duties during an evacuation;

(iii) Consider the needs of all occupants of the home including but not limited to:

(I) Access to medical records necessary to provide services and treatment;

(II) Access to pharmaceuticals, medical supplies, and equipment during and after an evacuation; and

(III) Behavioral support needs.

(iv) Include provisions and supplies sufficient to shelter in place for a minimum of three days without electricity, running water, or replacement staff; and

(v) Planned relocation sites.

(B) The licensee must notify the Department or the local licensing authority of the homes status in the event of an emergency that requires evacuation and during any emergent situation when requested.

(C) The licensee must re-evaluate the emergency preparedness plan at least annually and whenever there is a significant change in the home.

Requirements for Ventilator-Assisted Care

Adult foster homes that provide ventilator-assisted care for residents must meet the following requirements in addition to the other requirements set forth in these rules:

....

(7) FACILITY STANDARDS. An applicant and licensee must meet and maintain compliance with the above standards. In addition:

(a) The residents' bedrooms must be a minimum of 100 square feet, or larger if necessary, to accommodate the standard requirements of the above standards, the needs of the resident, and the equipment and supplies necessary for the care and services needed by individuals requiring ventilator-assisted care.

(b) Homes that provide ventilator-assisted care for residents must have a functional, emergency back-up generator. The generator must be adequate to maintain electrical service for resident needs until regular service is restored. Hard wired, back-up generators must be

installed by a licensed electrician. Back-up generators must be tested monthly and the test must be documented in the facility records.

(c) The home must have a functional, interconnected carbon monoxide and smoke alarm system with back-up batteries.

(d) The home must have a functional sprinkler system and maintenance of the sprinkler system must be completed as recommended by the manufacturer. A home that does not have a functional sprinkler system but was approved to provide ventilator-assisted care prior to _____, must install a functional whole-home sprinkler system no later than two years later.

(e) Each resident's bedroom must have a mechanism in place that enables the resident to summon a caregiver's assistance when needed. The mechanism must be within the abilities of the resident to use. The summons must be audible in all areas of the adult foster home

Statement of Problem and Substantiation for Public Input

Over the last several decades, adult foster homes have become a common application for reducing healthcare costs while at the same time providing higher quality of life for both regular patients and veterans alike. The concept basically involves providing healthcare as simply as just making sure that a patient receives their proper medications at the proper time, up to and including providing advanced medical care for a patient that is on a respirator, and virtually every type of situation in between.
This public input proposal recommends, as a starting point, the rules as they exist for the state of Oregon for these types of situations. Oregan has had adult foster care programs in place for about two decades now. Using these rules as a starting point for developing specific code provisions for application to one or two family dwellings that house patients in an adult foster care setting, the NFPA can provide leadership in guiding both states that have yet to adopt an adult foster care program and for those who have already adopted such programs. NFPA's unique expertise in the building code arena will prove useful to many of those involved in approving requirements for the buildings in which adult foster care is provided.
Substantiation: Since one and two family dwellings are not covered in any other parts of the NFPA 5000 building code when being used as a medical facility, code provisions must be established to help provide safe and functional settings within which adult foster care can be provided. While these Oregon rules are only intended to be a starting point, and obviously, many of the Oregon provisions might be resolved as NFPA code provisions by simple reference to other provisions in the NFPA 5000 code, there is still a need for review by experts in this area.
The following link provides a brief description of what adult foster care programs are all about:
http://www.oregon.gov/dhs/spd/pages/provtools/afh-apd/overview.aspx
The following link explains what is expected of those that provide healthcare in the adult foster care setting:
http://www.oregon.gov/dhs/providers-partners/licensing/APD-AFH/Pages/index.aspx
The following link provides access to all of the rules relating to adult foster care homes in Oregon:
http://www.oregon.gov/dhs/spd/provtools/afh-apd/docs/2015-1-5%20411-050%20%20Rule%20Text.pdf

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Public Input No. 417-NFPA 101-2015 [New Section after A.4.6.10.2]

A. ***4.6.12.1.1.1*** ***The process of correcting or repairing an impairment should begin as soon as the impairment is discovered. If the necessary parts are on hand the correction or repair can be accomplished in a matter of a few hours. However, in many cases, it may take several days to order repair parts, have them shipped, and schedule manpower to make the repair.***

A.4.6.12.1.1.2 ***The process of correcting or repairing a critical deficiency should begin as soon as it is discovered and with a sense of urgency. If the necessary parts are on hand the correction or repair can be accomplished in a matter of a few hours. However, in many cases it may take several days to order repair parts, have them shipped, and schedule manpower to make the repair. There are very few instances when a critical deficiency cannot be corrected or repaired within 30 days.***

A.4.6.12.1.1.3 ***Non-critical deficiencies do not have an effect on system performance and therefore correcting or repairing them is allowed to take longer.***

Statement of Problem and Substantiation for Public Input

This language sets specific time frames for corrective action to remedy impairments, critical deficiencies, and non-critical deficiencies identified by NFPA 25.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 416-NFPA 101-2015 [New Section after 4.6.12.1]	Main PI in body of standard

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Public Input No. 100-NFPA 101-2015 [New Section after B.4]

Annex C NFPA Documents on Hazardous Materials

This annex is not a part of the requirements of the NFPA document but is included for informational purposes only.

NFPA 30, NFPA 45, NFPA 54, NFPA 55, NFPA 58, NFPA 400, and NFPA 495 represent a comprehensive set of requirements for protection against hazardous material emergencies appropriate to the level of safety afforded by the *Life Safety Code* .

Where a conflict exists between applicable requirements, an analysis should be made and the proper applicable requirement should be implemented or conformed to subject to the approval of the AHJ. [**400** : A.4.4]

The safe handling, collection, and disposal of hazardous waste can be accomplished only if the physical, chemical, and hazardous properties of its components are known and that information is properly applied. [**400:** A.4.5 (part)]

NFPA 30, 45, 55, and 400 include maximum allowable quantities (MAQs) and the control area concept, and limits the MAQs within each control area. An established set of requirements apply to control areas with less than the MAQs. Control areas with hazardous materials quantities above the MAQs require additional controls or commensurate safeguards and features. NFPA 45 uses the term laboratory unit which correlates to and is similar to control areas. From NFPA 400, “The purpose is to permit limited amounts of hazardous contents in occupancies having minimum controls without triggering the more restrictive Protection Level 1 through Protection Level 4 building requirements.” [400: A5.1 (part)]

The following scope and exclusions are provided from NFPA 30, NFPA 45, NFPA 54, NFPA 55, NFPA 58, NFPA 400, and NFPA 495 to clarify the applicability of each code. Refer to individual documents for additional definitions, and requirements.

NFPA 30 Section 1.1.1 states: *This code shall apply to the storage, handling, and use of flammable and combustible liquids, including waste liquids* . [**30** : 1.1.1]

NFPA 30 Section 1.1.2 states: *This code shall not apply to the following:*

(1) Any liquid that has a melting point of 100°F (37.8°C) or greater

(2) Any liquid that does not meet the criteria for fluidity given in the definition of liquid in [NFPA 30] Chapter 3 and in the provisions of [NFPA 30] Chapter 4

(3) Any cryogenic fluid or liquefied gas, as defined in Chapter 3

(4) Any liquid that does not have a flash point, but which is capable of burning under certain conditions

(5) Any aerosol product

(6) Any mist, spray, or foam

(7) Transportation of flammable and combustible liquids as governed by the U.S. Department of Transportation

(8) Storage, handling, and use of fuel oil tanks and containers connected with oil-burning equipment

(9) Use and installation of alcohol-based hand rub (ABHR) dispensers

[**30** : 1.1.2 (modified)]

NFPA 45 Section 1.1.1 states: *This code shall apply to laboratory buildings, laboratory units, and laboratory work areas whether located above or below grade in which chemicals, as*

defined, are handled or stored . [**45** : 1.1.1]

NFPA 45 Section 1.1.2 states: *This code shall not apply to the following:*

(1) Laboratories for which the following conditions apply:

(a) Laboratory units that contain less than or equal to 4 L (1 gal) of flammable or combustible liquid

(b) Laboratory units that contain less than 2.2 standard m3 (75 scf) of flammable gas, not including piped-in low-pressure utility gas installed in accordance with NFPA 54, National Fuel Gas Code

(2) Laboratories that are pilot plants

(3) Laboratories that handle only chemicals with a hazard rating of 0 or 1, as defined by NFPA 704, Standard System for the Identification of the Hazards of Materials for Emergency Response, for all of the following: health, flammability, and instability

(4) Laboratories that are primarily manufacturing plants

(5) Incidental testing facilities

(6) Physical, electronic, instrument, laser, or similar laboratories that use chemicals only for incidental purposes, such as cleaning

(7) Hazards associated with radioactive materials, as covered by NFPA 801, Standard for Fire Protection for Facilities Handling Radioactive Materials

(8) Laboratories that work only with explosive material, as covered by NFPA 495, Explosive Materials Code

[45: 1.1.2]

NFPA 54 Section 1.1.1.1 states: *This code is a safety code that shall apply to the installation of fuel gas piping systems, appliances, equipment, and related accessories as shown in* [NFPA 54] *1.1.1.1(A) through 1.1.1.1(D).*

(A) Coverage of piping systems shall extend from the point of delivery to the appliance connections. For other than undiluted liquefied petroleum gas (LP-Gas) systems, the point of delivery shall be the outlet of the service meter assembly or the outlet of the service regulator or service shutoff valve where no meter is provided. For undiluted LP-Gas systems, the point of delivery shall be considered to be the outlet of the final pressure regulator, exclusive of line gas regulators where no meter is installed. Where a meter is installed, the point of delivery shall be the outlet of the meter.

(B) The maximum operating pressure shall be 125 psi (862 kPa).

Exception No. 1: Piping systems for gas–air mixtures within the flammable range are limited to a maximum pressure of 10 psi (69 kPa).

Exception No. 2: LP-Gas piping systems are limited to 20 psi (140 kPa), except as provided in 5.5.1(6).

(C) Requirements for piping systems shall include design, materials, components, fabrication, assembly, installation, testing, inspection, operation, and maintenance.

(D) Requirements for appliances, equipment, and related accessories shall include installation, combustion, and ventilation air and venting.

[**54** : 1.1.1]

NFPA 55 Section 1.1.2 states: *This code shall not apply to the following items (reference standards for some of which appear in Annex L):*

(1) Portable LP-Gas appliances and equipment of all types that are not connected to a fixed fuel piping system

(2) Installation of appliances such as brooders, dehydrators, dryers, and irrigation equipment

used for agricultural purposes

(3) Raw material (feedstock) applications except for piping to special atmosphere generators

(4) Oxygen–fuel gas cutting and welding systems

(5) Industrial gas applications using such gases as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen

(6) Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants

(7) Large integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by chemical reactions or used in chemical reactions

(8) LP-Gas installations at utility gas plants

(9) Liquefied natural gas (LNG) installations

(10) Fuel gas piping in electric utility power plants

(11) Proprietary items of equipment, apparatus, or instruments such as gas generating sets, compressors, and calorimeters

(12) LP-Gas equipment for vaporization, gas mixing, and gas manufacturing

(13) LP-Gas piping for buildings under construction or renovations that is not to become part of the permanent building piping system—that is, temporary fixed piping for building heat

(14) Installation of LP-Gas systems for railroad switch heating

(15) Installation of LP-Gas and compressed natural gas (CNG) systems on vehicles

(16) Gas piping, meters, gas pressure regulators, and other appurtenances used by the serving gas supplier in distribution of gas, other than undiluted LP-Gas

(17) Building design and construction, except as specified herein

(18) Fuel gas systems on recreational vehicles manufactured in accordance with NFPA1192, Standard on Recreational Vehicles

(19) Fuel gas systems using hydrogen as a fuel

(20) Construction of appliances

[**54** : 1.1.1.2]

NFPA 58 Section 1.1 states: *This code shall apply to the storage, handling, transportation, and use of liquefied petroleum gas (LP-Gas)* . [**58** : 1.1]

NFPA 58 Section 1.3.2 states: *This code shall not apply to the following:*

(1) Frozen ground containers and underground storage in caverns, including associated piping and appurtenances used for the storage of LP-Gas

(2) Natural gas processing plants, refineries, and petrochemical plants

(3) LP-Gas at utility gas plants (including refrigerated storage) (see NFPA 59, Utility LP-Gas Plant Code)

(4) Chemical plants where specific approval of construction and installation plans is obtained from the authority having jurisdiction

(5) LP-Gas used with oxygen

(6) The portions of LP-Gas systems covered by NFPA 54 (ANSI Z223.1), National Fuel Gas Code, where NFPA 54 (ANSI Z223.1) is adopted, used, or enforced

(7) Transportation by air (including use in hot air balloons),rail, or water under the jurisdiction of the DOT

(8) Marine fire protection

(9) Refrigeration cycle equipment and LP-Gas used as a refrigerant in a closed cycle

(10) The manufacturing requirements for recreational vehicle LP-Gas systems that are addressed by NFPA 1192, Standard on Recreational Vehicles

(11) Propane vehicle fuel dispensers located at multiple fuel refueling stations (see NFPA 30A, Code for Motor Fuel Dispensing Facilities and Repair Garages)

NFPA 400 Section 1.1.2 states: *This code shall apply to the storage, use, and handling of the following hazardous materials in all occupancies and facilities:*

(1) Ammonium nitrate solids and liquids

(2) Corrosive solids and liquids

(3) Flammable solids

(4) Organic peroxide formulations

(5) Oxidizer — solids and liquids

(6) Pyrophoric solids and liquids

(7) Toxic and highly toxic solids and liquids

(8) Unstable (reactive) solids and liquids

(9) Water-reactive solids and liquids

(10) Compressed gases and cryogenic fluids as included within the context of NFPA 55, Compressed Gases and Cryogenic Fluids Code

[**400** : 1.1.1]

NFPA 400 Section 1.1.2.1 states *: The quantity and arrangement limits in this code shall not apply to facilities that use ammonium perchlorate in the commercial manufacture of large-scale rocket motors.*

NFPA 400 Section 1.1.2.2 states: *This code shall not apply to the following:*

(1) Storage or use of hazardous materials for individual use on the premises of one- and two-family dwellings

(2) Explosives or blasting agents, which are regulated by NFPA 495, Explosive Materials Code, and display fireworks, 1.3 G, which are regulated by NFPA 1124, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles

(3) Refrigerants and refrigerant oil contained within closed cycle refrigeration systems complying with the fire code and the mechanical code adopted by the jurisdiction

(4) High hazard contents stored or used in farm buildings or similar occupancies and in remote locations for on premises agricultural use

(5) Corrosive materials in stationary batteries utilized for facility emergency power or uninterrupted power supply, or similar purposes, in accordance with NFPA 1, Fire Code

(6) Aerosols complying with NFPA 30B, Code for the Manufacture and Storage of Aerosol Products

(7) Consumer fireworks, 1.4G complying with NFPA 1124, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles

(8) Corrosive materials displayed in original packaging in mercantile occupancies and intended for personal or household use or as building materials

(9) Flammable and combustible liquids having no other physical or health hazard properties covered by this code

(10) Organic peroxide formulations that are capable of detonation as manufactured or when unpackaged or in authorized shipping containers under conditions of fire exposure, when stored, manufactured, or used in accordance with NFPA 495, Explosive Materials Code

(11) Combustible metals, as defined in NFPA484, Standard for Combustible Metals

(12) LP-Gas complying with NFPA 58, Liquefied Petroleum Gas Code or NFPA 59, Utility LP-Gas Plant Code

(13) When approved, materials that have been satisfactorily demonstrated not to present a potential danger to public health, safety, or welfare, based upon the quantity or

condition of storage

(14) The off-site transportation of hazardous materials when in accordance with Department of Transportation (DOT) regulations

NFPA 495 Section 1.1 states: *This code shall apply to the manufacture, transportation, storage, sale, and use of explosive materials* . [**495** : 1.1]

NFPA 495 Sections 1.3.1 through 1.3.6 provide the following exemptions:

Section 1.3.1: *This code shall not apply to the transportation of explosive materials where under the jurisdiction of the U.S. Department of Transportation (DOT). It shall apply, however, to state and municipal supervision of compliance with U.S. DOT 49 CFR 100–199.*

Section 1.3.2: *This code shall not apply to the transportation and use of military explosives by federal or state military agencies, nor shall it apply to the transportation and use of explosive materials by federal, state, or municipal agencies while engaged in normal or emergency performance of duties.*

Section 1.3.3: *This code shall not apply to the manufacture of explosive materials under the jurisdiction of the U.S. Department of Defense (DOD). This code also shall not apply to the distribution or storage of explosive materials by military agencies of the United States, nor shall it apply to arsenals, navy yards, depots, or other establishments owned or operated by, or on behalf of, the United States.*

Section 1.3.4: *This code shall not apply to pyrotechnics such as flares, fuses, and railway torpedoes. It also shall not apply to fireworks and pyrotechnic special effects as defined in NFPA 1123, Code for Fireworks Display; NFPA 1124, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles; and NFPA 1126, Standard for the Use of Pyrotechnics Before a Proximate Audience.*

Section 1.3.5: *This code shall not apply to model and high power rocketry as defined in NFPA 1122, Code for Model Rocketry; NFPA 1125, Code for the Manufacture of Model Rocket and High Power Rocket Motors; and NFPA1127, Code for High Power Rocketry.*

Section: 1.3.6: *This code shall not apply to the use of explosive materials in medicines and medicinal agents in the forms prescribed by the United States Pharmacopeia or the National Formulary.*

Statement of Problem and Substantiation for Public Input

This Public Input is submitted on behalf of the Hazardous Materials Task Group. The Life Safety Code Correlating Committee appointed the Hazardous Materials Task Group to review hazardous materials provisions within the code and provide a recommendation. This Task Group included representative membership from the Life Safety Code core and occupancy chapters. The Task Group agreed that a gap existed and ultimately recommended additional provisions to more comprehensively address hazardous materials within the Life Safety Code. The agreed set of recommendations include revisions to the following sections: 1.1.5, 4.1.3, 4.2.3, 6.2.2, 7.12, 8.7.3, and new Annex C. The majority of the revisions reference existing NFPA standards, rather than create new technical requirements within the code. Scoping sections for these standards are reproduced within a new Annex C to provide guidance. New Proposed Annex C is included for clarity.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 94-NFPA 101-2015 [New Section after 1.1.4]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 95-NFPA 101-2015 [New Section after 4.1.2]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 96-NFPA 101-2015 [New Section after 4.2.2]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 97-NFPA 101-2015 [Section No. 6.2.2.1]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 98-NFPA 101-2015 [New Section after 7.11.6]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 99-NFPA 101-2015 [Section No. 8.7.3]	Part of comprehensive set of recommendations from the Hazardous Materials Task Group
Public Input No. 94-NFPA 101-2015 [New Section after 1.1.4]	
Public Input No. 95-NFPA 101-2015 [New Section after 4.1.2]	
Public Input No. 96-NFPA 101-2015 [New Section after 4.2.2]	
Public Input No. 97-NFPA 101-2015 [Section No. 6.2.2.1]	
Public Input No. 98-NFPA 101-2015 [New Section after 7.11.6]	
Public Input No. 99-NFPA 101-2015 [Section No. 8.7.3]	

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Public Input No. 387-NFPA 101-2015 [Section No. C.1.1]

C.1.1 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 1, *Fire Code*, 2015 edition.

NFPA 3, *Recommended Practice for Commissioning of Fire Protection and Life Safety Systems,* 2015 edition.

NFPA 10, *Standard for Portable Fire Extinguishers*, 2013 edition.

NFPA 13, *Standard for the Installation of Sprinkler Systems*, 2013 edition.

NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes*, 2013 edition.

NFPA 13R, *Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies*, 2013 edition.

NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*, 2013 edition.

NFPA 22, *Standard for Water Tanks for Private Fire Protection*, 2013 edition.

NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, 2014 edition.

NFPA 30, *Flammable and Combustible Liquids Code*, 2015 edition.

NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages,* 2015 edition.

NFPA 58, *Liquefied Petroleum Gas Code*, 2014 edition.

NFPA 61, *Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities*, 2013 edition.

NFPA 68, *Standard on Explosion Protection by Deflagration Venting*, 2013 edition.

NFPA 70 ®, *National Electrical Code* ®, 2014 edition.

NFPA 72 ®, *National Fire Alarm and Signaling Code*, 2013 edition.

NFPA 80, *Standard for Fire Doors and Other Opening Protectives*, 2013 edition.

NFPA 88A, *Standard for Parking Structures*, 2015 edition.

NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, 2015 edition.

NFPA 92, *Standard for Smoke Control Systems*, 2012 edition.

NFPA 99, *Health Care Facilities Code*, 2015 edition.

NFPA 101A, *Guide on Alternative Approaches to Life Safety*, 2013 edition.

NFPA 105, *Standard for Smoke Door Assemblies and Other Opening Protectives*, 2013 edition.

NFPA 110, *Standard for Emergency and Standby Power Systems*, 2013 edition.

NFPA 170, *Standard for Fire Safety and Emergency Symbols*, 2012 edition.

NFPA 204, *Standard for Smoke and Heat Venting*, 2012 edition.

NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel–Burning Appliances*, 2013 edition.

NFPA 220, *Standard on Types of Building Construction*, 2015 edition.

NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations*, 2013 edition.

NFPA 252, *Standard Methods of Fire Tests of Door Assemblies*, 2012 edition.

NFPA 253, *Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a*

Radiant Heat Energy Source, 2011 edition.

NFPA 257, *Standard on Fire Test for Window and Glass Block Assemblies*, 2012 edition.

NFPA 259, *Standard Test Method for Potential Heat of Building Materials*, 2013 edition.

NFPA 260, *Standard Methods of Tests and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture*, 2013 edition.

NFPA 261, *Standard Method of Test for Determining Resistance of Mock-Up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes*, 2013 edition.

NFPA 265, *Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile or Expanded Vinyl Wall Coverings on Full Height Panels and Walls*, 2011 edition.

NFPA 269, *Standard Test Method for Developing Toxic Potency Data for Use in Fire Hazard Modeling*, 2012 edition.

NFPA 275, *Standard Method of Fire Tests for the Evaluation of Thermal Barriers*, 2013 edition.

NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*, 2011 edition.

NFPA 289, *Standard Method of Fire Test for Individual Fuel Packages*, 2013 edition.

NFPA 307, *Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves*, 2011 edition.

NFPA 409, *Standard on Aircraft Hangars*, 2011 edition.

NFPA 501A, *Standard for Fire Safety Criteria for Manufactured Home Installations, Sites, and Communities*, 2013 edition.

NFPA 551, *Guide for the Evaluation of Fire Risk Assessments*, 2013 edition.

NFPA 601, *Standard for Security Services in Fire Loss Prevention*, 2015 edition.

NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*, 2010 edition.

NFPA 703, *Standard for Fire Retardant–Treated Wood and Fire-Retardant Coatings for Building Materials*, 2015 edition.

NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment*, 2015 edition.

NFPA 850, *Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations*, 2010 edition.

NFPA 914, *Code for Fire Protection of Historic Structures*, 2010 edition.

NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*, 2013 edition.

NFPA 1600 ®, *Standard on Disaster/Emergency Management and Business Continuity Programs*, 2013 edition.

NFPA 5000 ®, *Building Construction and Safety Code* ®, 2015 edition.

Fire Protection Handbook, 19th edition, 2003.

Fire Protection Handbook, 20th edition, 2008.

SFPE Handbook of Fire Protection Engineering, 4th edition, 2008.

Waksman, D., and J. B. Ferguson. August 2008. Fire Tests of Building Interior Covering Systems. In *Fire Technology,* 10:211 – 220.

Statement of Problem and Substantiation for Public Input

If PI 280, which adds Annex material recommending commissioning of fire protection and life safety systems is accepted, there needs to be a reference to NFPA 3.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 280-NFPA 101-2015 [New Section after 9.6.1.4]	adds reference if PI 280 is accepted.

Submitter Information Verification

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Public Input No. 24-NFPA 101-2015 [Section No. C.1.2]

C.1.2 Other Publications.

C.1.2.1 ACI Publication.

American Concrete Institute, ~~P.O. Box 9094~~ **38800 Country Club Drive** , Farmington Hills, MI ~~48333~~ **48331-3434** . www.concrete.org

ACI 216.1/~~TMS 0216.1~~ , *Code Requirements for Determining Fire Resistance of Concrete and Masonry Construction Assemblies*, ~~2008~~ **2014** .

C.1.2.2 ANSI Publications.

American National Standards Institute, Inc., 25 West 43rd Street, 4th Floor, New York, NY 10036. www.ansi.org

ANSI/BHMA A156.10, ~~*American National Standard for*~~ *Power Operated Pedestrian Doors*, ~~1999~~ **2011** .

ANSI/BHMA A156.19, ~~*American National Standard for*~~ *Power Assist and Low Energy Power Operated Doors*, ~~2002~~ **2013** .

ICC/ANSI A117.1, ~~*American National Standard for*~~ *Accessible and Usable Buildings and Facilities*, 2009.

C.1.2.3 ASCE Publications.

American Society of Civil Engineers, 1801 Alexander Bell Drive, Reston, VA 20191-4400. www.asce.org

ASCE/**SEI/** SFPE 29, *Standard Calculation Methods for Structural Fire Protection*, 2005.

C.1.2.4 ASHRAE Publications.

ASHRAE, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. www.ashrae.org

ASHRAE *Handbook ~~and Product Directory~~ — Fundamentals*, ~~2001~~ **2013** .

Klote, J.H., and Milke, J.A., *Principles of Smoke Management*, 2002.

C.1.2.5 ASME Publications.

~~American Society of Mechanical Engineers~~ **ASME Internationl** , Two Park Avenue, New York, NY 10016-5990. www.asme.org

ASME A17.1/CSA B44, *Safety Code for Elevators and Escalators*, ~~2006~~ **2013** .

ASME A17.3, *Safety Code for Existing Elevators and Escalators*, ~~2005~~ **2011** .

C.1.2.6 ASSE Publications.

American Society ~~of Sanitary Engineering, 901 Canterbury Road, Suite A, Westlake, OH 44145-1480~~ **of Safety Engineers, 520 N. Northwest Highway, Park Rigde, IL 60068** .

ANSI /~~ASSE~~ A1264.2, ~~*Standard for the*~~ *Provision of Slip Resistance on Walking/Working Surfaces*, 2012.

C.1.2.7 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959. www.astm.org

ASTM ~~C 1629~~ C1629 /~~C 1629M~~ C1629M , *Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels*, ~~2006 (2011)~~ **2014a .**

ASTM ~~D 2859~~ D2859 , *Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials*, 2006~~ (, Reapproved 2011) .**

ASTM ~~E 84~~ E84 , *Standard Test Method for Surface Burning Characteristics of Building Materials*, ~~2013~~ **2015** .

ASTM ~~E 119~~ E119 , *Standard Test Methods for Fire Tests of Building Construction and Materials*, ~~2012a~~ **2014** .

ASTM ~~E 648~~ E648 , *Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source*, ~~2010~~ **2014c** .

ASTM ~~E 814~~ E814 , *Standard Test Method for Fire Tests of Through-Penetration Fire Stops*, ~~2011a~~ **2014 e1** .

ASTM ~~E 1352~~ E1352 , *Standard Test Method for Cigarette Ignition Resistance of Mock-Up Upholstered Furniture Assemblies*, 2008**a** .

ASTM ~~E 1353~~ E1353 , *Standard Test Methods for Cigarette Ignition Resistance of Components of Upholstered Furniture*, 2008**a e1** .

ASTM ~~E 1472~~ E1472 , *Standard Guide for Documenting Computer Software for Fire Models,* 2007 (withdrawn 2011).

ASTM ~~E 1537~~ E1537 , *Standard Test Method for Fire Testing of Upholstered Furniture*, 2013.

ASTM ~~E 1590~~ E1590 , *Standard Test Method for Fire Testing of Mattresses*, 2013.

ASTM ~~E 1966~~ E1966 , *Standard Test Method for Fire-Resistive Joint Systems*, 2007~~ (, Reapproved 2011) .**

ASTM ~~E 2030~~ E2030 , *Standard Guide for Recommended Uses of Photoluminescent (Phosphorescent) Safety Markings*, 2009a.

ASTM ~~E 2174~~ E2174 , *Standard Practice for On-Site Inspection of Installed Fire Stops,*~~ 2010a e1~~ **2014b** .

ASTM ~~E 2238~~ E2238 , *Standard Guide for Evacuation Route Diagrams*, **Reinstated** 2012.

ASTM ~~E 2280~~ E2280 , *Standard Guide for Fire Hazard Assessment of the Effect of Upholstered Seating Furniture Within Patient Rooms of Health Care Facilities*, ~~2009~~ **2013** .

ASTM ~~E 2307~~ E2307 , *Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-Story Test Apparatus*, ~~2010~~ **2015** .

ASTM ~~E 2393~~ E2393 , *Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers,* 2010a.

ASTM ~~E 2484~~ E2484 , *Standard Specification for Multi-Story Building External Evacuation Controlled Descent Devices*, 2008.

ASTM ~~E 2513~~ E2513 , *Standard Specification for Multi-Story Building External Evacuation Platform Rescue Systems*, 2007**, Reapproved 2012** .

ASTM ~~E 2768~~ E2768 , *Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials*, 2011.

ASTM ~~F 1637~~ F1637 , *Standard Practice for Safe Walking Surfaces*, ~~2010~~ **2013** .

ASTM ~~F 1870~~ F1870 , *Standard Guide for Selection of Fire Test Methods for the Assessment of Upholstered Furnishings in Detention and Correctional Facilities*, 2011.

C.1.2.8 California Technical Bulletins.

State of California, Department of Consumer Affairs, Bureau of Home Furnishings and Thermal Insulation, 3485 Orange Grove Avenue, North Highlands, CA 95660-5595.

Technical Bulletin 129, “Flammability Test Procedure for Mattresses for Use in Public Buildings,” October 1992.

Technical Bulletin 133, “Flammability Test Procedure for Seating Furniture for Use in Public Occupancies,” January 1991.

C.1.2.9 FM Publications.

FM Global, ~~1301 Atwood~~ **270 Central** **Avenue** , P.O. Box 7500, Johnston, RI 02919. www.fmglobal.com

FM **Approval** 4880, ~~*Approval Standard for*~~ *Class I Insulated Wall or Wall and Roof/Ceiling Panels~~*; Plastic*~~ **,** *Interior Finish Materials*~~; Plastic Exterior Building Panels; Wall/Ceiling Coating Systems; Interior or Exterior Finish Systems~~* , ~~1994~~ ***or Coatings and*** *Exterior* ***Wall*** *Systems* , **2010** .

FM Approval ~~Standard~~ 6921, *Containers for Combustible Waste*, 2004.

C.1.2.10 NEMA Publications.

National Electrical Manufacturers Association, 1300 North 17th Street, Suite ~~1847~~ **900** , ~~Rosslyn~~ **Arlington** , VA 22209.

ANSI/NEMA Z535.1, *Standard for Safety Colors*, 2006**, Reaffirmed 2011** .

C.1.2.11 NIST Publications.

National Institute of Standards and Technology, 100 Bureau Drive, Gaithersburg, MD 20899-1070. www.nist.gov

NISTIR 5445, *Feasibility of Fire Evacuation by Elevators at FAA Control Towers*, 1994.

C.1.2.12 RESNA Publications.

Rehabilitation Engineering and Assistive Technology Society of North America, 1700 N Moore St, Suite 1540, Arlingtron, VA 22209.

ANSI/RESNA ED-1, *Emergency Stair Travel Devices Used by Individuals with Disabilities, Volume 1*, 2013.

C.1.2.13 SFPE Publications.

Society of Fire Protection Engineers, ~~7315 Wisconsin Avenue~~ **9711 Washington Blvd. , Suite** ~~1225 W~~ **380 ,** ~~Bethesda~~ **Gaithersburg , MD** ~~20814~~ **20878** . www.sfpe.org

SFPE Code Official's Guide to Performance-Based Design Review, 2004.

SFPE Engineering Guide — Evaluation of the Computer Fire Model DETACT-QS, 2002.

SFPE Engineering Guide to Human Behavior in Fire, 2003.

SFPE Engineering Guide to Performance-Based Fire Protection , , 2007.

SFPE Guidelines for Peer Review in the Fire Protection Design Process, 2009.

SFPE Guidelines for Substantiating a Fire Model for a Given Application, 2011.

C.1.2.14 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096. www.ul.com

UL *Fire Resistance Directory*, 2013.

~~ANSI/~~ UL 217, *Single and Multiple Station Smoke Alarms*, **2006, Revised** 2012.

~~ANSI/~~ UL 263, ~~*Standard for*~~ *Fire Tests of Building Construction and Materials*, 2003, Revised ~~2011~~ **2014**.

~~ANSI/~~ UL 723, ~~*Standard for*~~ *Test for Surface Burning Characteristics of Building Materials,* 2008, Revised ~~2010~~ **2013**.

~~ANSI/~~ UL 1040, ~~*Standard for*~~ *Fire Test of Insulated Wall Construction*, 2009, Revised ~~2013~~ **2012**.

~~ANSI/~~ UL 1479, ~~*Standard for*~~ *Fire Tests of Through-Penetration Firestops*, 2003, Revised 2012.

~~ANSI/~~ UL 1715, ~~*Standard for*~~ *Fire Test of Interior Finish Material*, 1997, Revised 2013.

~~ANSI/~~ UL 1975, ~~*Standard for*~~ *Fire Tests for Foamed Plastics Used for Decorative Purposes*, 2006.

~~ANSI/~~ UL 2079, ~~*Standard for*~~ *Tests for Fire Resistance of Building Joint Systems*, 2004, Revised ~~2012~~ **2014**.

C.1.2.15 U.S. Government Publications.

U.S. ~~Government Printing~~ Government **Publishing** Office, Washington, DC 20402. www.access.gpo.gov/

Title 16, Code of Federal Regulations, Part 1630, “Standard for the Surface Flammability of Carpets and Rugs” (FF 1-70).

Title 16, Code of Federal Regulations, Part 1632, “Standard for the Flammability of Mattresses and Mattress Pads” (FF 4-72).

Title 28, Code of Federal Regulations, Part 36, Appendix A, “Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities.”

Title 29, Code of Federal Regulations, Part 1910, Subparts E and L, “OSHA Regulations for Emergency Procedures and Fire Brigades.”

Title 29, Code of Federal Regulations, Part 1910.146, “Permit-Required Confined Spaces.”

Lee, A and Pineda, D. 2010, *Smoke Alarms – Pilot Study of Nuisance Alarms Associated with Cooking*, Bethesda, MD: US Consumer Product Safety Commission.

C.1.2.16 Other Publications.

Australian Fire Engineering Guidelines. 1996. Sydney, Australia: Fire Code Perform Centre, Ltd.~~ *British Standard Firesafety Engineering in Buildings* , DD240: Part 1. 1997. London, England: British Standards Institution.~~

BS DD 240-1, Fire Safety Engineering In Buildings - Part 1: Guide To The Application Of Fire Safety Engineering Principles, 1997 .

Gann, R. G., V. Babrauskas, R. D. Peacock, and J. R. Hall. 1994. Fire conditions for smoke toxicity measurement. *Fire and Materials* 18(193): 193–99.

Kaplan, H. L., and G. E. Hartzell. 1984. Modeling of toxicological effects of fire gases: I. Incapacitation effects of narcotic fire gases. *Journal of Fire Sciences* 2:286–305.

Hirschler et al., “Carbon monoxide and human lethality: Fire and non-fire studies,” Elsevier, 1993.

Olenick, S., and D. Carpenter. 2003. An updated international survey of computer models for fire and smoke. *Journal of Fire Protection Engineering* 3(2):87–110.

Templer, J. A., *The Staircase: Studies of Hazards, Falls, and Safer Design*, Cambridge, MA: MIT Press, 1992.

Statement of Problem and Substantiation for Public Input

Referenced current SDO names, addresses, standard names, numbers, and editions.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 23-NFPA 101-2015 [Section No. 2.3]	Referenced current SDO names, addresses, standard names, numbers, and editions.
Public Input No. 22-NFPA 101-2015 [Global Input]	

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Public Input No. 130-NFPA 101-2015 [Section No. C.1.2.7]

C.1.2.7 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959. www.astm.org

ASTM ~~C 1629~~ C1629 /~~C 1629M~~ C1629M , *Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels*, 2006 (2011).

ASTM ~~D 2859~~ D2859 , *Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials*, 2006 (2011).

ASTM ~~E 84~~ E84 , *Standard Test Method for Surface Burning Characteristics of Building Materials*, ~~2013~~ 2015a .

ASTM ~~E 119~~ E119 , *Standard Test Methods for Fire Tests of Building Construction and Materials*, ~~2012a~~ 2014 .

ASTM ~~E 648~~ E648 , *Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source*, ~~2010~~ 2014c .

ASTM ~~E 814~~ E814 , *Standard Test Method for Fire Tests of Through-Penetration Fire Stops*, ~~2011a~~ 2013a .

ASTM ~~E 1352~~ E1352 , *Standard Test Method for Cigarette Ignition Resistance of Mock-Up Upholstered Furniture Assemblies*, 2008.

ASTM ~~E 1353~~ E1353 , *Standard Test Methods for Cigarette Ignition Resistance of Components of Upholstered Furniture*, 2008.

ASTM ~~E 1472~~ E1472 , *Standard Guide for Documenting Computer Software for Fire Models,* 2007 (withdrawn 2011).

ASTM ~~E 1537~~ E1537 , *Standard Test Method for Fire Testing of Upholstered Furniture*, 2013.

ASTM ~~E 1590~~ E1590 , *Standard Test Method for Fire Testing of Mattresses*, 2013.

ASTM ~~E 1966~~ E1966 , *Standard Test Method for Fire-Resistive Joint Systems*, 2007 (2011).

~~ASTM E 2030~~ ASTM E2030 , *Standard Guide for Recommended Uses of Photoluminescent (Phosphorescent) Safety Markings*, 2009a.

ASTM ~~E 2174~~ E2174 , *Standard Practice for On-Site Inspection of Installed Fire Stops,* 2010a e1.

ASTM ~~E 2238~~ E2238 , *Standard Guide for Evacuation Route Diagrams*, 2012.

ASTM ~~E 2280~~ E2280 , *Standard Guide for Fire Hazard Assessment of the Effect of Upholstered Seating Furniture Within Patient Rooms of Health Care Facilities*, ~~2009~~ 2013 .

ASTM ~~E 2307~~ E2307 , *Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-Story Test Apparatus*, ~~2010~~ 2015a .

ASTM ~~E 2393~~ E2393 , *Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers,* 2010a.

ASTM ~~E 2484~~ E2484 , *Standard Specification for Multi-Story Building External Evacuation Controlled Descent Devices*, 2008.

ASTM ~~E 2513~~ E2513 , *Standard Specification for Multi-Story Building External Evacuation Platform Rescue Systems*, 2007.

ASTM ~~E 2768~~ E2768 , *Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials*, 2011.

ASTM ~~F 1637~~ F1637 , *Standard Practice for Safe Walking Surfaces*, 2010.

ASTM ~~F 1870~~ F1870 , *Standard Guide for Selection of Fire Test Methods for the Assessment of Upholstered Furnishings in Detention and Correctional Facilities*, 2011.

Statement of Problem and Substantiation for Public Input

date updates

Submitter Information Verification

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Public Input No. 393-NFPA 101-2015 [Section No. C.1.2.14]

C.1.2.14 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096. www.ul.com

UL *Fire Resistance Directory*, 2013.

ANSI/UL 217, *Single and Multiple Station Smoke Alarms*, 2012~~.~~ , Revised 2015

ANSI/UL 263, *Standard for Fire Tests of Building Construction and Materials*, 2003, Revised ~~2011~~ 2014 .

ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials,* 2008, Revised ~~2010~~ 2013 .

ANSI/UL 1040, *Standard for Fire Test of Insulated Wall Construction*, 2009, Revised 2013.

ANSI/UL 1479, *Standard for Fire Tests of Through-Penetration Firestops*, 2003, Revised 2012.

ANSI/UL 1715, *Standard for Fire Test of Interior Finish Material*, 1997, Revised 2013.

ANSI/UL 1975, *Standard for Fire Tests for Foamed Plastics Used for Decorative Purposes*, 2006.

ANSI/UL 2079, *Standard for Tests for Fire Resistance of Building Joint Systems*, 2004, Revised ~~2012~~ 2014 .

Statement of Problem and Substantiation for Public Input

The proposed changes reflect updated editions of UL Standards

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Submittal Date: Mon Jul 06 09:40:08 EDT 2015

Public Input No. 16-NFPA 5000-2015 [Global Input]

1. Delete the reference in Sections 2.2 and 2.4 as follows:

~~NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and pyrotechnic Articles*, 2013 edition.~~

2. Delete 3.3.49 and A.3.3.49 as follows:

~~**3 . 3 .49 * Barricade.** A natural or artificial barrier that effectively screens a magazine, building, railway, or highway from the effects of an explosion in a magazine or building containing explosives. [**1124,** 2013]~~

~~**A.3.3.49 Barricade.** Barricades designed and constructed in accordance with TM 5-1300/AFM 88-22/NAVFAC P-397, *S tructures to Resist the Effects of Accidental Explosions,* a r e used in circumstances where the building itself is designed to contain the explosive effects. Free standing barriers can also be constructed to meet these requirements.~~

3. Delete 3.3.125 as follows:

~~**3.3.125 Consumer Fireworks, 1.4G.** S ee 3 . 3 . 2 43. 1.~~

4. Revise 3.3.243 to read as follows:

3 .3. 2 4 3 Fireworks. Any composition or device for the purpose of producing a visible or an audible effect by combustion, deflagration, or detonation, and that meets the definition of ~~Consumer Fireworks, 1.4G, or~~ Display Fireworks, 1.3G, as set forth in this *Code.*

5. Delete 3.3.243.1 and A.3.3.243.1 as follows:

~~**3 . 3 . 2 4 3 .1 * *Consumer Fireworks, 1.4G.*** *(Formerly known as Class C, Common Fireworks.)* Any small fireworks device d esigned primarily to produce visible effects by combustion that complies with the construction, chemical composition, and l a be ling regulations of the U.S. Consumer Product Safety Commission, as set forth in Title 16, CFR, Parts 1500 and 1507. Some small devices designed to produce audible effects are included, such as whistling devices, ground devices containing 0.8 gr (50 mg) or less of explosive composition (salute powder), and aerial devices containing 2 gr (130 mg) or less of explosive composition (salute powder) per explosive unit.~~

~~**A .3.3.243.1 Consumer Fireworks, 1.4G.** Consumer Fireworks, 1.4G contain limited quantities of pyrotechnic composition per u nit a nd do n ot pose a mass explosion hazard where stored. Therefore, they are not required to be stored in a magazine. Consumer Fireworks, 1.4G are normally classed as Explosive, 1.4G and described as Fireworks UN0336 by the U.S. Department of Transportation (U.S. DOT). *(See Annex C of* NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles.)*~~

6. Revise 3.3.243.2 and A.3.3.243.2 to read as follows:

3 . 3 . 2 4 3 .2 * *Display Fireworks, 1.3G.* *(Formerly known as Class B, Special Fireworks.)* Large fireworks articles designed to produce visible or audible effects for entertainment purposes by combustion, deflagration, or detonation. This term includes, but is not limited to, salutes containing more than 2 gr (130 mg) of explosive composition (salute powder) and aerial shells containing more than 60 g (2.1 oz) of total pyrotechnic and explosive composition~~, and other display pieces that exceed the limits for classification as Consumer Fireworks, 1.4G~~.

A.3.3.243.2 Display Fireworks, 1.3G. Display Fireworks, 1.3G are described as Fireworks

UN0335 and classed as Explosive,

1.3G by the U.S. Department of Transportation (U.S. DOT). ~~*(See Annex C of* NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles.)*~~

7. Delete 3.3.526 as follows:

~~**3 . 3 .52 6 Pyrotechnic Article.** A pyrotechnic device, other than a device classed as fireworks, for use in the entertainment industry. [**1124,** 2013]~~

8. Revise 6.3.2.4.4 to read as follows:

6 . 3 .2. 4 . 4 High Hazard Level 3 Contents. High hazard Level 3 contents shall include materials that readily support combustion or present a physical hazard including, but not limited to, the following:

(1) Level 2 and Level 3 aerosols

(2) Class I, Class II, or Class III-A flammable or combustible liquids that are used or stored in normally closed containers or systems at gauge pressures of less than 15 psi (103 kPa)

~~(3) Consumer Fireworks, 1.4 G~~

(3) Flammable solids, other than dusts classified as high hazard Level 2, stored, used, or generated in a manner creating a high fire hazard

(4) Class II and Class III organic peroxides

(5) Class 2 solid or liquid oxidizers

(6) Class 3 solid or liquid oxidizers that are used or stored in normally closed containers or systems at gauge pressures of less than 15 psi (103 kPa)

(7) Oxidizing gases and oxidizing cryogenic liquids

(8) Class 2 unstable (reactive) materials

(9) Class 2 water-reactive materials

9. Delete 6.4.2.25 as follows:

~~**6 .4. 2 . 2 5 Fireworks and Pyrotechnic Articles Facilities.** Buildings in which fireworks and pyrotechnic articles are manufactured, stored, or sold at retail, and magazines in which fireworks, 1.1 and fireworks, 1.3 are stored, shall be constructed in accordance with NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles* .~~

1 0 . Revise A.3.3.407.3 to read as follows:

A.3.3.407.3 Explosive Material. The term *explosive material* includes, but is not limited to, dynamite, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord, igniters, and Display Fireworks,

1.3G (Class B, Special). The term *explosive* includes any material determined to be within the scope of Title 18, United States

Code, Chapter 40, and also includes any material classified as an explosive ~~o ther than Consumer Fireworks, 1.4G (Class C, Common),~~ by the Hazardous Materials Regulations of the U.S. Department of Transportation (DOT) in 49 CFR.

The former classification system used by DOT included the terms *high explosive* and *low explosive*, as further defined in A.3.3.407.3.2. These terms remain in use by the U.S. Bureau of Alcohol, Tobacco, Firearms, and Explosives. Explosive materials classified as hazard Class 1 are further defined under the current system applied by DOT. Compatibility group letters are used in concert with division numbers to specify further limitations on each division noted. For example, the letter G (as in

1.4G) identifies substances or articles that contain a pyrotechnic substance and similar materials. UN/DOT Class 1 Explosives are defined as follows….

11. Delete the reference in H.1.1 as follows:

~~NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles*, 2013 edition.~~

Additional Proposed Changes

File Name	Description	Approved
5000-15-2_Log_1139_SC_14-8-35_CONCURRENT_-_TIA_5000-15-2.pdf	NFPA TIA 15-2 Log No. 1139	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from Tentative Interim Amendment No. 15-2 (Log 1139) issued by the Standards Council on August 14, 2014 and per the NFPA Regs., needs to be reconsidered by the Technical Committee for the next edition of the Document.

Submitter's Substantiation: Deletes reference to NFPA 1124, or a consumer fireworks provision, or both. Consistent with NFPA Standards Council Decision D#14-1, issued March 3, 2014, NFPA has temporarily withdrawn NFPA 1124, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles. The effect of this decision is that no recognized criteria for the subjects previously governed by NFPA 1124 exist within the NFPA codes and standards system; thus, this TIA works to align NFPA 5000 with that circumstance.

Emergency Nature: NFPA 1124 has been temporarily withdrawn as a result of Standards Council Decision D#14-1, which was issued March 3, 2014, subsequent to completion of the NFPA 5000-2015 Second Draft, but prior to the issuance of NFPA 5000-2015. Accordingly, this TIA is intended to be issued concurrently with NFPA 5000-2015.

Submitter Information Verification

Submitter Full Name: TC ON BLD-FUN
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Submittal Date: Mon Mar 09 10:47:26 EDT 2015

Tentative Interim Amendment

NFPA 5000®

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2015 Edition

Reference: Various
TIA 15-2
(SC 14-8-35 / TIA Log #1139)

Note: Text of the TIA issued and incorporated into the text of the document, therefore no separate publication is necessary.

1. Delete the reference in Sections 2.2 and 2.4 as follows:

~~NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and pyrotechnic Articles*, 2013 edition.~~

2. Delete 3.3.49 and A.3.3.49 as follows:

~~**3.3.49* Barricade.** A natural or artificial barrier that effectively screens a magazine, building, railway, or highway from the effects of an explosion in a magazine or building containing explosives. [**1124,** 2013]~~

~~**A.3.3.49 Barricade.** Barricades designed and constructed in accordance with TM 5-1300/AFM 88-22/NAVFAC P-397, *Structures to Resist the Effects of Accidental Explosions*, are used in circumstances where the building itself is designed to contain the explosive effects. Free standing barriers can also be constructed to meet these requirements.~~

3. Delete 3.3.125 as follows:

~~**3.3.125 Consumer Fireworks, 1.4G.** See 3.3.243.1.~~

4. Revise 3.3.243 to read as follows:

3.3.243 Fireworks. Any composition or device for the purpose of producing a visible or an audible effect by combustion, deflagration, or detonation, and that meets the definition of ~~Consumer Fireworks, 1.4G, or~~ Display Fireworks, 1.3G, as set forth in this *Code.*

5. Delete 3.3.243.1 and A.3.3.243.1 as follows:

~~**3.3.243.1* *Consumer Fireworks, 1.4G.*** *(Formerly known as Class C, Common Fireworks.)* Any small fireworks device designed primarily to produce visible effects by combustion that complies with the construction, chemical composition, and labeling regulations of the U.S. Consumer Product Safety Commission, as set forth in Title 16, CFR, Parts 1500 and 1507. Some small devices designed to produce audible effects are included, such as whistling devices, ground devices containing 0.8 gr (50 mg) or less of explosive composition (salute powder), and aerial devices containing 2 gr (130 mg) or less of explosive composition (salute powder) per explosive unit.~~

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~~**A.3.3.243.1 Consumer Fireworks, 1.4G.** Consumer Fireworks, 1.4G contain limited quantities of pyrotechnic composition per unit and do not pose a mass explosion hazard where stored. Therefore, they are not required to be stored in a magazine. Consumer Fireworks, 1.4G are normally classed as Explosive, 1.4G and described as Fireworks UN0336 by the U.S. Department of Transportation (U.S. DOT). *(See Annex C of* NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles.)*~~

6. Revise 3.3.243.2 and A.3.3.243.2 to read as follows:

3.3.243.2* *Display Fireworks, 1.3G.* *(Formerly known as Class B, Special Fireworks.)* Large fireworks articles designed to produce visible or audible effects for entertainment purposes by combustion, deflagration, or detonation. This term includes, but is not limited to, salutes containing more than 2 gr (130 mg) of explosive composition (salute powder) and aerial shells containing more than 60 g (2.1 oz) of total pyrotechnic and explosive composition~~, and other display pieces that exceed the limits for classification as Consumer Fireworks, 1.4G~~.

A.3.3.243.2 Display Fireworks, 1.3G. Display Fireworks, 1.3G are described as Fireworks UN0335 and classed as Explosive, 1.3G by the U.S. Department of Transportation (U.S. DOT). ~~*(See Annex C of* NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles.)*~~

7. Delete 3.3.526 as follows:

~~**3.3.526 Pyrotechnic Article.** A pyrotechnic device, other than a device classed as fireworks, for use in the entertainment industry. [**1124,** 2013]~~

8. Revise 6.3.2.4.4 to read as follows:

6.3.2.4.4 High Hazard Level 3 Contents. High hazard Level 3 contents shall include materials that readily support combustion or present a physical hazard including, but not limited to, the following:
(1) Level 2 and Level 3 aerosols
(2) Class I, Class II, or Class III-A flammable or combustible liquids that are used or stored in normally closed containers or systems at gauge pressures of less than 15 psi (103 kPa)
~~(3) Consumer Fireworks, 1.4 G~~
(3) Flammable solids, other than dusts classified as high hazard Level 2, stored, used, or generated in a manner creating a high fire hazard
(4) Class II and Class III organic peroxides
(5) Class 2 solid or liquid oxidizers
(6) Class 3 solid or liquid oxidizers that are used or stored in normally closed containers or systems at gauge pressures of less than 15 psi (103 kPa)
(7) Oxidizing gases and oxidizing cryogenic liquids
(8) Class 2 unstable (reactive) materials
(9) Class 2 water-reactive materials

9. Delete 6.4.2.25 as follows:

~~**6.4.2.25 Fireworks and Pyrotechnic Articles Facilities.** Buildings in which fireworks and pyrotechnic articles are manufactured, stored, or sold at retail, and magazines in which fireworks, 1.1 and fireworks, 1.3 are stored, shall be constructed in accordance with NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles*.~~

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10. Revise A.3.3.407.3 to read as follows:

A.3.3.407.3 Explosive Material. The term *explosive material* includes, but is not limited to, dynamite, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord, igniters, and Display Fireworks, 1.3G (Class B, Special). The term *explosive* includes any material determined to be within the scope of Title 18, United States Code, Chapter 40, and also includes any material classified as an explosive ~~other than Consumer Fireworks, 1.4G (Class C, Common),~~ by the Hazardous Materials Regulations of the U.S. Department of Transportation (DOT) in 49 CFR.

The former classification system used by DOT included the terms *high explosive* and *low explosive*, as further defined in A.3.3.407.3.2. These terms remain in use by the U.S. Bureau of Alcohol, Tobacco, Firearms, and Explosives. Explosive materials classified as hazard Class 1 are further defined under the current system applied by DOT. Compatibility group letters are used in concert with division numbers to specify further limitations on each division noted. For example, the letter G (as in 1.4G) identifies substances or articles that contain a pyrotechnic substance and similar materials. UN/DOT Class 1 Explosives are defined as follows….

11. Delete the reference in H.1.1 as follows:

~~NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles*, 2013 edition.~~

Issue Date: August 14, 2014
Effective Date: September 3, 2014

(**Note: For further information on NFPA Codes and Standards, please see** www.nfpa.org/codelist)
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Public Input No. 17-NFPA 5000-2015 [Global Input]

1. Revise 7.4.1.4.5.3 to read as follows:

7 . 4 . 1 .4. 5 . 3 Frangible Building. A frangible building containing high hazard contents requiring Protection Level 1 or Protection Level 2 shall not be required to comply with the other provisions of Section 7.4, provided that it complies with all of the following conditions:

(1) The allowable area of the frangible building is less than or equal to 400 ft2 (37 m2) in floor area ~~or the building and its use comply with NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles* , and the floor area does not exceed that allowed in Table 7.4.1~~.

(2) The frangible building is a maximum of one story in height above grade plane without any basements.

(3)*The frangible building has a maximum occupant load of two people ~~u nless the building and its use comply with NFPA 1124.~~ (4) The frangible building is separated in accordance with Chapter 34~~, unless the building and its use comply with NFPA 1124~~.

2. Revise D.7.4.3 to read as follows:

D.7.4.3 Frangible Building. A frangible building containing high hazard contents requiring Protection Level 1 or Protection Level 2 shall not be required to comply with the other provisions of Section D.7.4, provided that it complies with all of the following conditions:

(1) The allowable area of a frangible building is less than or equal to 400 ft2 (37.2 m2) in floor area~~, or the building and its use comply with NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles* , and the EF compartment area does not exceed that allowed in Table D.4.2.1(b)~~.

(2) The frangible building is a maximum of one story without any basements.

(3) The frangible building has a maximum occupant load of two people~~, unless the building and its use comply with NFPA 1124~~.

(4) The frangible building is separated in accordance with Chapter 34~~, unless the building and its use comply with NFPA 1124~~.

3. Delete H.1.1 as follows:

~~**H.1.1** NFP A 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles*,~~

~~2 013 e d ition.~~

Additional Proposed Changes

File Name	Description	Approved
5000-15-5_Log_1142_SC_14-8-38_CONCURRENT_-_TIA_5000-15-5.pdf	NFPA TIA 15-5 Log No. 1142	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from Tentative Interim Amendment No. 15-5 (Log 1142) issued by the Standards Council on August 14, 2014 and per the NFPA Regs., needs to be reconsidered by the

Technical Committee for the next edition of the Document.

Submitter's Substantiation: Deletes reference to NFPA 1124, or a consumer fireworks provision, or both. Consistent with NFPA Standards Council Decision D#14-1, issued March 3, 2014, NFPA has temporarily withdrawn NFPA 1124, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles. The effect of this decision is that no recognized criteria for the subjects previously governed by NFPA 1124 exist within the NFPA codes and standards system; thus, this TIA works to align NFPA 5000 with that circumstance.

Emergency Nature: NFPA 1124 has been temporarily withdrawn as a result of Standards Council Decision D#14-1, which was issued March 3, 2014, subsequent to completion of the NFPA 5000-2015 Second Draft, but prior to the issuance of NFPA 5000-2015. Accordingly, this TIA is intended to be issued concurrently with NFPA 5000-2015.

Submitter Information Verification

Submitter Full Name: TC ON BLD-BLC
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Submittal Date: Mon Mar 09 15:35:14 EDT 2015

Tentative Interim Amendment

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Reference: 7.4.1.4.5.3, D.7.4.3, and H.1.1
TIA 15-5
(SC 14-8-38 / TIA Log #1142)

Note: Text of the TIA issued and incorporated into the text of the document, therefore no separate publication is necessary.

1. Revise 7.4.1.4.5.3 to read as follows:

7.4.1.4.5.3 Frangible Building. A frangible building containing high hazard contents requiring Protection Level 1 or Protection Level 2 shall not be required to comply with the other provisions of Section 7.4, provided that it complies with all of the following conditions:
(1) The allowable area of the frangible building is less than or equal to 400 ft^2 (37 m^2) in floor area ~~or the building and its use comply with NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles*, and the floor area does not exceed that allowed in Table 7.4.1~~.
(2) The frangible building is a maximum of one story in height above grade plane without any basements.
(3)*The frangible building has a maximum occupant load of two people ~~unless the building and its use comply with NFPA 1124~~.
(4) The frangible building is separated in accordance with Chapter 34~~, unless the building and its use comply with NFPA 1124~~.

2. Revise D.7.4.3 to read as follows:

D.7.4.3 Frangible Building. A frangible building containing high hazard contents requiring Protection Level 1 or Protection Level 2 shall not be required to comply with the other provisions of Section D.7.4, provided that it complies with all of the following conditions:
(1) The allowable area of a frangible building is less than or equal to 400 ft^2 (37.2 m^2) in floor area~~, or the building and its use comply with NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles*, and the EF compartment area does not exceed that allowed in Table D.4.2.1(b)~~.
(2) The frangible building is a maximum of one story without any basements.
(3) The frangible building has a maximum occupant load of two people~~, unless the building and its use comply with NFPA 1124~~.
(4) The frangible building is separated in accordance with Chapter 34~~, unless the building and its use comply with NFPA 1124~~.

3. Delete H.1.1 as follows:

~~**H.1.1** NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles*, 2013 edition.~~

Issue Date: August 14, 2014
Effective Date: September 3, 2014

(**Note: For further information on NFPA Codes and Standards, please see** www.nfpa.org/codelist)
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Public Input No. 18-NFPA 5000-2015 [Global Input]

1. Delete the reference in 27.4.5.3(8) as follows:

~~(8) NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles*~~

2. Delete 27.4.6 as follows:

~~**27.4.6 Retail Sales of Consumer Fireworks, 1.4G.** M e rcantile occupancies where the retail sales of Consumer Fireworks, 1.4G a r e conducted shall comply with NFPA 1124.~~

Additional Proposed Changes

File Name	Description	Approved
5000-15-6_Log_1143_SC_14-8-39_CONCURRENT_-_TIA_5000-15-6.pdf	NFPA TIA 15-6 Log No. 1143	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from Tentative Interim Amendment No. 15-6 (Log 1143) issued by the Standards Council on August 14, 2014 and per the NFPA Regs., needs to be reconsidered by the Technical Committee for the next edition of the Document.

Submitter's Substantiation: Deletes reference to NFPA 1124, or a consumer fireworks provision, or both. Consistent with NFPA Standards Council Decision D#14-1, issued March 3, 2014, NFPA has temporarily withdrawn NFPA 1124, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles. The effect of this decision is that no recognized criteria for the subjects previously governed by NFPA 1124 exist within the NFPA codes and standards system; thus, this TIA works to align NFPA 5000 with that circumstance.

Emergency Nature: NFPA 1124 has been temporarily withdrawn as a result of Standards Council Decision D#14-1, which was issued March 3, 2014, subsequent to completion of the NFPA 5000-2015 Second Draft, but prior to the issuance of NFPA 5000-2015. Accordingly, this TIA is intended to be issued concurrently with NFPA 5000-2015.

Submitter Information Verification

Submitter Full Name: TC ON BLD-MER
Organization: NFPA TC on Mercantile and Business Occupancies
Street Address:
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Submittal Date: Mon Mar 09 15:53:58 EDT 2015

Tentative Interim Amendment

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Reference: 27.4.5.3(8) and 27.4.6
TIA 15-6
(SC 14-8-39 / TIA Log #1143)

Note: Text of the TIA issued and incorporated into the text of the document, therefore no separate publication is necessary.

A Tentative Interim Amendment is tentative because it has not been processed through the entire standards-making procedures. It is interim because it is effective only between editions of the standard. A TIA automatically becomes a public input of the proponent for the next edition of the standard; as such, it then is subject to all of the procedures of the standards-making process.

1. Delete the reference in 27.4.5.3(8) as follows:

~~(8) NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles*~~

2. Delete 27.4.6 as follows:

~~**27.4.6 Retail Sales of Consumer Fireworks, 1.4G.** Mercantile occupancies where the retail sales of Consumer Fireworks, 1.4G are conducted shall comply with NFPA 1124.~~

Issue Date: August 14, 2014
Effective Date: September 3, 2014

(**Note: For further information on NFPA Codes and Standards, please see** www.nfpa.org/codelist)
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Public Input No. 19-NFPA 5000-2015 [Global Input]

1. Delete 34.1.1.2(14) as follows:

~~(14) Consumer fireworks, 1.4G, in mercantile occupancies complying with NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles*~~

2. In Table 34.1.3.1, delete the row for "consumer fireworks."

3. In Table 34.1.3.2(a) through Table 34.1.3.2(h), delete the row for "consumer fireworks."

Additional Proposed Changes

File Name	Description	Approved
5000-15-4_Log_1141_SC_14-8-37_CONCURRENT_-_TIA_5000-15-4.pdf	NFPA TIA 15-4 Log No. 1141	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from Tentative Interim Amendment No. 15-4 (Log 1141) issued by the Standards Council on August 14, 2014 and per the NFPA Regs., needs to be reconsidered by the Technical Committee for the next edition of the Document.

Submitter's Substantiation: Deletes reference to NFPA 1124, or a consumer fireworks provision, or both. Consistent with NFPA Standards Council Decision D#14-1, issued March 3, 2014, NFPA has temporarily withdrawn NFPA 1124, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles. The effect of this decision is that no recognized criteria for the subjects previously governed by NFPA 1124 exist within the NFPA codes and standards system; thus, this TIA works to align NFPA 5000 with that circumstance.

Emergency Nature: NFPA 1124 has been temporarily withdrawn as a result of Standards Council Decision D#14-1, which was issued March 3, 2014, subsequent to completion of the NFPA 5000-2015 Second Draft, but prior to the issuance of NFPA 5000-2015. Accordingly, this TIA is intended to be issued concurrently with NFPA 5000-2015.

Submitter Information Verification

Submitter Full Name:	TC ON BLD-IND
Organization:	NFPA TC on Industrial Storage, and Miscellaneous Occupancies
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City:	
State:	
Zip:	
Submittal Date:	Mon Mar 09 16:09:12 EDT 2015

Tentative Interim Amendment

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Reference: 34.1.1.2(14), Table 34.1.3.1, and Tables 34.1.3.2(a) through (h)
TIA 15-4
(SC 14-8-37 / TIA Log #1141)

Note: Text of the TIA issued and incorporated into the text of the document, therefore no separate publication is necessary.

1. Delete 34.1.1.2(14) as follows:

~~(14) Consumer fireworks, 1.4G, in mercantile occupancies complying with NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles*~~

2. *In Table 34.1.3.1, delete the row for "consumer fireworks."*

3. In Table 34.1.3.2(a) through Table 34.1.3.2(h), delete the row for "consumer fireworks."

Issue Date: August 14, 2014
Effective Date: September 3, 2014

(**Note: For further information on NFPA Codes and Standards, please see** www.nfpa.org/codelist)
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Public Input No. 22-NFPA 5000-2015 [Global Input]

1. Revise 16.4.1, from what was done by Second Revision SR-173 (Annual 2014 revision cycle – NFPA 5000 Second Draft), to read as follows:

16.4.1 Life Safety Evaluation.

16.4.1.1* General. Where a life safety evaluation is required by other provisions of ~~the~~ this *Code*, it shall comply with all of the following:

(1) The life safety evaluation shall be performed by persons acceptable to the AHJ.

(2) The life safety evaluation shall include a written assessment of safety measures for conditions listed in

16.4.1.2 and of the building systems and facility management in accordance with 16.4.1.3.

(3) The life safety evaluation shall be approved annually by the AHJ and shall be updated for special or unusual conditions.

16.4.1.2 Conditions to Be Assessed. Life safety evaluations shall include an assessment of all of the following conditions and the related appropriate safety measures:

(1) Nature of the events and the participants and attendees

(2) Access and egress movement, including crowd density problems

(3) Medical emergencies

(4) Fire hazards

(5) Permanent and temporary structural systems

(6) Severe weather conditions

(7) Earthquakes

(8) Civil or other disturbances

(9) Hazardous materials incidents within and near the facility

(10) Relationships among facility management, event participants, emergency response agencies, and others having a role in the events accommodated in the facility

16.4.1.3* Building Systems and Facility Management Assessments. Life safety evaluations shall include assessments of both building systems and facility management upon which reliance is placed for the safety of facility occupants, and such assessments shall consider scenarios appropriate to the facility.

16.4.1.3.1 Building Systems. Prior to issuance of the building permit, the design team shall provide the AHJ with building systems documentation in accordance with 16.4.1.4.

16.4.1.3.2 Facility Management. Prior to issuance of the certificate of occupancy, the facility management shall provide

the AHJ with facility management documentation in accordance with 16.4.1.5.

16.4.1.3.3 Life Safety Evaluation.

16.4 . 1.3 . 3. 1 Prior to issuance of the building permit, the persons performing the life safety evaluation shall confirm that the building systems provide appropriate safety measures.

16.4 . 1.3 . 3. 2 Prior to issuance of the certificate of occupancy, the persons performing the life safety evaluation shall confirm that the facility management and operational plans provide

appropriate safety measures.

16.4 . 1.3 . 3. 3 The AHJ shall ~~determine~~ approve the acceptable persons performing the life safety evaluation in a timely manner to enable the design team and facility management to resolve concerns to the satisfaction of the persons performing the life safety evaluation prior to their submission.

16.4.1.4 Life Safety Building Systems Document. The AHJ shall be provided with a life safety building systems document providing the information required in 16.4.1.4.2 through 16.4.1.4.4.

16.4.1.4.1 Document Distribution. The persons performing the life safety evaluation, the AHJ, the A/E design team, and the building owner shall receive a copy of the life safety building systems document prior to issuance of the building permit.**16.4.1.4.2 Life Safety Narrative.** A life safety narrative shall be provided describing the following:

(1) Building occupancy, construction type, and intended uses and events

(2) Building area and population capacity of the proposed facility

(3) Principal fire and life safety features/strategies for the building, ~~such as~~ including–as applicable–the following:

(a) Egress

(b) Access control

(c) Fire barriers, smoke barriers, and smoke partitions

(d) ~~Sprinkler protection~~F ire suppression systems

(~~b~~ e) Smoke control/protection

(~~c~~f) Fire detection and alarm ~~— visual and audible~~

(~~d~~g) PA system

(h) Emergency elevator operation

(~~e~~i) Emergency power and lighting

(fj) Provisions for patrons with disabilities

(~~g~~k) Fire department access

(~~h~~ l) Fire/Emergency command center

(4) Exterior construction design parameters used/applied

16.4.1.4.3 Life Safety Floor Plans. Life safety floor plans of each level shall be provided–as applicable– with the following:

(1) Occupant load, exit location, ~~exit~~ egress capacity, main ~~exit/entry~~ entrance/exit, horizontal exits, travel distance, and exit discharge

(2) Fire barriers, ~~and~~ smoke barriers, and smoke partitions

(3) Areas of smoke-protected assembly occupancy

(4) Separate smoke-protected areas or zones~~, if applicable~~

(5) Areas of other occupancy type and separations~~, if required~~

(6) Unprotected vertical openings~~, including atriums, communicating spaces, and convenience openings~~

(7) Event plans for each anticipated type of event depicting the following:

(a) Seating configuration

(b) Exhibit booth layout

(c) Stage location

(d) Occupant load, ~~exit~~ egress capacity required, exits provided, and travel distance

(e) Any floor or stage use restrictions

(f) Plan and/or section drawing indicating areas where the roof construction is more than 50 ft (15 m)

above floor level and ~~limits~~ areas where ~~of~~ sprinkler protection is omitted

(g) Areas of refuge — interior and exterior

16.4.1.4.4 Engineering Analysis and Calculations. An engineering analysis ~~and calculations~~ shall be provided with the following:

(1) Smoke protection ~~calculations~~ analysis to substantiate the use of smoke-protected assembly seating as follows:

(a) Performance-based design methods approved by the AHJ

(b) Smoke ~~exhaust and fresh air~~c ontrol requirements per NFPA 92, *Standard for Smoke Control Systems*

(c) Smoke control assumptions, such as fire scenario description, fire size quantification, and smoke development/smoke movement analysis

~~(b) Smoke maintained at a level 6 ft above the floor of the means of egress~~ (cd) Proposed testing protocol for smoke control system and pass/fail criteria ~~(d) Calculations for performance-based design methods accepted by the AHJ (e) Smoke and fire modeling~~

(fe) Timed egress analysis and assumed flow rates and travel speeds

~~(g) Assumed flow rates and travel speed~~

(2) Sprinkler protection calculations, including an engineering analysis substantiating locations in accordance with ~~12.~~ 3 ~~.5.3~~ 16.3 . 5. 3 where sprinkler protection would be ineffective due to height and combustible loading (3) Load diagram of rigging/load capacity of gridiron, fly loft, or long-span roof structure used for hanging overhead objects

16.4.1.5 Life Safety Management Document. The AHJ shall be provided with a life safety management document providing the information required in 16.4.1.5.2 through 16.4.1.5.7.

16.4.1.5.1 Document Distribution. The persons performing the life safety evaluation, the AHJ, the A/E design team, and the building owner shall receive a copy of the life safety management document prior to issuance of the certificate of occupancy.

16.4.1.5.2 Facility Management and Operational Plans. Facility management and operational plans shall address the

following:

(1) Best practices adopted or recognized

(2) Emergency plans

(3) Evacuation plans

(4) Shelter-in-place plans, including capacities and protection considerations

(5) Crowd management training plan

(6) Safety plans, which include the following:

(a) Training plans

(b) Safety equipment plans

(7) Fire alarm, smoke control system protocol, and testing plans

(8) First aid or medical treatment plans, which include the following:

(a) Defined levels of service

(b) Standing orders adopted

(c) Supply and equipment plan

(9) Housekeeping plans — biological, medical, hazardous materials cleaning

(10) Emergency communication plans, which include the following:

(a) Chain of authority and incident command system employed

(b) Contact information for the following:

i. Venue personnel

ii. Emergency management and response organizations, ~~(e.g.,s~~ uch as fire, police, medical, utility, transportation, and key stakeholders)

(c) Communication systems

(d) Standard announcement for incidents or emergency situations

(11) Risk and threat assessment for venue and surrounding area for the following:

(a) Severe weather

(b) Hazardous materials

(c) Terrorism

(d) Hostile intruder

(12) Operating procedures and protocols for risks, such as the following:

(a) Severe weather preparedness and monitoring plans

(b) Hazardous materials incidence response plans

(c) Terrorism response plans

(d) Hostile intruder response plans

(13) First responder response/arrival routes plans

(14) Alcohol management plans

(15) Food safety plans

(16) Rigging and temporary performance structure, which includes the following:

(a) Design and safety review plans

(b) Emergency action plans

(17) Chemical and hazardous materials information and data

(18) Barrier and wall protection plans for motor sports or similar events

16.4.1.5.3 Records. Records of the facility management plans, including procedures and location, shall be maintained for the following:

(1) Crowd management training

(2) Safety training

(3) Fire alarm, smoke control system maintenance, and test records

(4) First aid or medical treatment and regulation compliance

16.4.1.5.4 Building Systems Reference Guide. A building systems reference guide shall be provided in accordance with 16.4.1.5.4.1 through 16.4.1.5.4.3.

16.4 . 1.5 . 4. 1 A basic life safety building systems reference guide shall be developed and maintained.

16.4 . 1.5 . 4. 2 The life safety building systems reference guide shall contain the important

and key information for the venue management's use when planning events/activities for the safety of patrons, performers/participants, employees, and ~~vendersv~~ endors.

16.4 . 1.5 . 4. 3 The life safety building systems document in accordance with 16.4.1.4 shall be permitted to be used, ~~but~~ a nd additionally the life safety building systems reference guide shall include the following:

(1) Occupant capacity of every space/room

(2) Egress flow diagrams, including assumed flow rates, and capacities of all aisles and hallways, including public and nonpublic areas

(3) Capacities of all exterior doors and/or choke points in immediate perimeter areas

(4) Limitations or assumptions for ingress control that could be in place during an emergency egress/evacuation, including control gates, queuing barriers, and turnstiles

(5) Capacities of immediate perimeter exterior walkways, including assumed flow rates for exterior areas

(6) Assumed egress paths for normal conditions — transportation modes

(7) Management level ~~(lay)~~ sequencing charts for alarm and emergency communication systems, the manual, or override options/instructions that include the following:

(a) List of codes or alarm signals

(b) Location of manual overrides

(c) Description of ~~what exactly happens during an alarm,~~ sequence of operations during an alarm such as exhaust fans operate or doors open

(8) ~~Principle~~ Principal fire and life safety features/strategies, such as sprinklers, smoke control, fire alarm notifications, PA system, emergency power, and fire department access

(9) Assumptions when developing occupancy plans for venue floor, open areas, and nonevent spaces, such as the following:

(a) Event floor plans/setup diagrams for each typical event/activity

(b) Fire sprinkler and smoke protection capabilities

(10) Severe weather shelter areas, locations, structure considerations (limitations), capacities (occupancy and density factor)

(11) Command center, which includes the following: (a) Location (formal or informal)

(b) Structural integrity considerations

(c) Redundant locations and/or capabilities

(d) Jurisdictional rights — assumed and/or applied

(12) Locations and capacities of wheelchair and mobility-impaired seating

(13) Locations and capacities of ~~"Safe Haven"a~~ reas of refuge and other safe areas

(14) Rigging or structural load capacities of grids, truss structure, fly lofts, ceilings, floors, ramps, ~~staging, etca~~ nd staging

(15) List of locations of emergency equipment ~~(i.e.,~~ such as fire extinguishers, fire hose cabinets, fire hydrants, AEDs~~, etc.)~~

(16) Sequencing of electrical service, such as the following:

(a) Emergency generators and charts of all areas illuminated during power outages

(b) Multiple electrical feed capabilities

(17) List of mechanical, moveable equipment in the facility

(18) Potential hazards in the surrounding neighborhood, including train tracks and propane stations

(19) Assumptions or accommodations considered and used in design

~~16.4.1.5.4.4~~ 16.4.1.5.5 The facility management plans shall be maintained and adjusted as necessary for changes to the venue structure, operating purposes and style, and event occupancy.

~~16.4.1.5.4.5~~ 16.4.1.5.6 Facility management and operational plans shall be ~~reviewed by~~ submitted to the AHJ annually.

~~16.4.1.5.4.6~~ 16.4.1.5.7 For events and activities at the venue that are outside the normal operating conditions or vary from the normal facility management plans, the following shall apply:

(1) Facility management shall perform an event/activity-specific facility management plan for the AHJ to review. (2) ~~The AHJ shall provide guidance as needed, but approval~~A pproval of the AHJ for the specific facility management plan shall occur prior to such event.

2. No further change to advisory annex text A.16.4.1.1 and A.16.4.1.3

Additional Proposed Changes

File Name	Description	Approved
TIA_5000-15-1_-_TIA_5000-15-1.pdf	NFPA TIA 15-1 Log No. 1131	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from Tentative Interim Amendment No. 15-1 (Log 1131) issued by the Standards Council on August 14, 2014 and per the NFPA Regs., needs to be reconsidered by the Technical Committee for the next edition of the Document.

Submitter's Substantiation: This TIA is submitted at the recommendation of the Correlating Committee on the Building Code which reviewed technical changes being made to the Life Safety Evaluation provisions related to designer and owner responsibilities (NFPA 5000 16.4.1) by the Assembly Occupancies Technical via the Second Draft for the 2015
Annual Meeting. The Correlating Committee is in agreement with the technical committee chair that revision is desirable to avoid potential for incorrect and inconsistent enforcement. The processing of the TIA is intended to provide the Standards Council with the materials it will need to blend the changes from the TIA with the code text developed by the
committee for issuance as part of the 2015 edition of NFPA 5000 – something the Council will address at its August 2014 meeting. Substantiation for the proposed corrections follows.

1. NFPA 5000 16.4.1.4.2 Life Safety Narrative. The Second Draft omits the following requirements for the Life Safety Narrative: egress; access control; fire barriers, smoke barriers, and smoke partitions; fire detection; and emergency elevator operation. These features are critical to the overall safety of the occupants. Without specific explanation, designers and enforcers may incorrectly assume that these items where purposefully omitted, which will lead to incomplete, incorrect, and potentially unsafe designs. This TIA corrects these omissions.

2. NFPA 5000 16.4.1.4.4 Engineering Analysis and Calculations. The Second Draft requires smoke control designs to meet NFPA 92 – Standard for Smoke Control Systems, and also requires the design to provide the following: smoke maintained at a level 6 ft above the floor of the means of egress. This new requirement will explicitly prohibit all smoke below 6 ft, whether tenable or not, and whether occupants have evacuated or not. This poses two issues.

Issue A. This is in direct conflict with long standing methods for evaluating performance criteria outlined within
NFPA 5000 A.5.2.2. More specifically, this conflicts with Methods 1 and 2.

- Method 1 allows occupants to evacuate through smoke where tenable conditions are maintained.
- Method 2 allows smoke to bank down within areas where occupants are expected to have previously evacuated, such as an upper level balcony in a large open space.

Both Methods allow smoke to descend below 6 ft above the floor of the means of egress, and are considered safe by
NFPA 5000.
To be clear, Life Safety Evaluations are intended to follow guidance from NFPA 5000 Chapter 5. The text of
A.16.4.1.1 states in part the following.
Life safety evaluations are examples of performance-based approaches to life safety. In this respect, significant guidance in the form and process of life safety evaluations is provided by Chapter 5, keeping in mind the fire safety emphasis in Chapter 5.
The 6 ft requirement is in direct conflict with Chapter 5. This TIA resolves this conflict.
Issue B. The second issue involves practical design implications with the 6 ft requirement, as this puts an undue burden upon designs using Computational Fluid Dynamics (CFD) simulation to substantiate tenability. In many cases, these simulations are necessary and prudent to appropriately account for smoke movement in geometrically complex spaces. In addition, the enhanced detail provided in less complex spaces allows for better informed design.
Consider the following, NFPA 92 Figure A.3.3.13.1 notes that the Smoke Layer Interface is above the First Indication of Smoke. Since equations within NFPA 92 specifically calculate the Smoke Layer Interface, smoke is clearly expected to be present below the NFPA 92 calculated smoke layer. Smoke below the calculated Smoke Layer Interface is neglected for Equations within NFPA 92.

CFD simulations provide better resolution of the smoke layer properties, and predict the Transition Zone with relatively good accuracy. When CFD methods are required to limit all smoke below the 6 ft zone (6 ft above the floor of the means of egress), the simulations must use the First Indication of Smoke as criteria, rather than the Smoke Layer Interface. Thus, these CFD simulations would require more smoke exhaust and would maintain the Smoke Layer Interface at a greater distance above the floor than required by NFPA 92 equations. This TIA resolves this conflict.

3. Example Inconsistencies NFPA 5000 16.4.1.3.3.3. Other changes within the TIA are proposed to avoid inconsistencies within NFPA 101. For example, NFPA 5000 16.4.1.3.3.3 in the proposed draft requires the following.

The AHJ shall determine acceptable persons performing the life safety evaluation in a timely manner to enable the design team and facility management to resolve concerns to the satisfaction of the persons performing the life safety evaluation prior to their submission.

The draft language requires the AHJ to determine the acceptable persons. This infers selection and thus places an undue burden on the AHJ. This also takes selection ability and responsibility away from the owner and designer team. The TIA amends the text from determine to approve to be consistent with other portions of NFPA 101.

Emergency Nature: In accordance with the Regulation Governing the Development of NFPA Standards, clause 5.3(a), the proposed TIA intends to correct an error or an omission that was overlooked during a regular revision process.
The changes for the 2015 draft were meant to clarify the responsibilities and the level of detail for Life Safety Analysis. As stated in the above substantiation, the text proposed by the committee includes incorrect and inconsistent provisions. These changes are necessary: (1) to avoid undue burden on the AHJ; (2) to avoid potentially unsafe designs; and (3) to avoid inherent inconsistencies in the 2015 edition of NFPA 5000.

By processing the TIA at this time, the public review and committee balloting (technical committee and

correlating committee) can be completed in time to provide the Standards Council with the materials it will need to blend the changes from the TIA with the code text developed by the committee for issuance as part of the 2015 edition of NFPA 5000.

Submitter Information Verification

Submitter Full Name: TC ON BLD-AXM
Organization: NFPA 5000 TC on Assembly Occupancies
Street Address:
City:
State:
Zip:
Submittal Date: Thu Mar 19 15:30:27 EDT 2015

Tentative Interim Amendment

NFPA 5000®

Building Construction and Safety Code ®

2015 Edition

Reference: 16.4.1 and A.16.4.1
TIA 15-1
(SC 14-8-34 / TIA Log #1131)

Note: Text of the TIA issued and incorporated into the text of the document, therefore no separate publication is necessary.

1. Revise 16.4.1, from what was done by Second Revision SR-173 (Annual 2014 revision cycle – NFPA 5000 Second Draft), to read as follows:

16.4.1 Life Safety Evaluation.
16.4.1.1* General. Where a life safety evaluation is required by other provisions of this *Code*, it shall comply with all of the following:

(1) The life safety evaluation shall be performed by persons acceptable to the AHJ.
(2) The life safety evaluation shall include a written assessment of safety measures for conditions listed in 16.4.1.2 and of the building systems and facility management in accordance with 16.4.1.3.
(3) The life safety evaluation shall be approved annually by the AHJ and shall be updated for special or unusual conditions.

16.4.1.2 Conditions to Be Assessed. Life safety evaluations shall include an assessment of all of the following conditions and the related appropriate safety measures:

(1) Nature of the events and the participants and attendees
(2) Access and egress movement, including crowd density problems
(3) Medical emergencies
(4) Fire hazards
(5) Permanent and temporary structural systems
(6) Severe weather conditions
(7) Earthquakes
(8) Civil or other disturbances
(9) Hazardous materials incidents within and near the facility
(10) Relationships among facility management, event participants, emergency response agencies, and others having a role in the events accommodated in the facility

16.4.1.3* Building Systems and Facility Management Assessments. Life safety evaluations shall include assessments of both building systems and facility management upon which reliance is placed for the safety of facility occupants, and such assessments shall consider scenarios appropriate to the facility.
16.4.1.3.1 Building Systems. Prior to issuance of the building permit, the design team shall provide the AHJ with building systems documentation in accordance with 16.4.1.4.

(**Note: For further information on NFPA Codes and Standards, please see** www.nfpa.org/codelist)
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16.4.1.3.2 Facility Management. Prior to issuance of the certificate of occupancy, the facility management shall provide the AHJ with facility management documentation in accordance with 16.4.1.5.

16.4.1.3.3 Life Safety Evaluation.

16.4.1.3.3.1 Prior to issuance of the building permit, the persons performing the life safety evaluation shall confirm that the building systems provide appropriate safety measures.

16.4.1.3.3.2 Prior to issuance of the certificate of occupancy, the persons performing the life safety evaluation shall confirm that the facility management and operational plans provide appropriate safety measures.

16.4.1.3.3.3 The AHJ shall approve the acceptable persons performing the life safety evaluation in a timely manner to enable the design team and facility management to resolve concerns to the satisfaction of the persons performing the life safety evaluation prior to their submission.

16.4.1.4 Life Safety Building Systems Document. The AHJ shall be provided with a life safety building systems document providing the information required in 16.4.1.4.2 through 16.4.1.4.4.

16.4.1.4.1 Document Distribution. The persons performing the life safety evaluation, the AHJ, the A/E design team, and the building owner shall receive a copy of the life safety building systems document prior to issuance of the building permit.

16.4.1.4.2 Life Safety Narrative. A life safety narrative shall be provided describing the following:

(1) Building occupancy, construction type, and intended uses and events
(2) Building area and population capacity of the proposed facility
(3) Principal fire and life safety features/strategies for the building, including–as applicable–the following:
    (a) Egress
    (b) Access control
    (c) Fire barriers, smoke barriers, and smoke partitions
    (d) Fire suppression systems
    (e) Smoke control/protection
    (f) Fire detection and alarm
    (g) PA system
    (h) Emergency elevator operation
    (i) Emergency power and lighting
    (j) Provisions for patrons with disabilities
    (k) Fire department access
    (l) Fire/Emergency command center
(4) Exterior construction design parameters used/applied

16.4.1.4.3 Life Safety Floor Plans. Life safety floor plans of each level shall be provided–as applicable–with the following:

(1) Occupant load, exit location, egress capacity, main entrance/exit, horizontal exits, travel distance, and exit discharge
(2) Fire barriers, smoke barriers, and smoke partitions
(3) Areas of smoke-protected assembly occupancy
(4) Separate smoke-protected areas or zones
(5) Areas of other occupancy type and separations
(6) Unprotected vertical openings
(7) Event plans for each anticipated type of event depicting the following:
    (a) Seating configuration
    (b) Exhibit booth layout
    (c) Stage location
    (d) Occupant load, egress capacity required, exits provided, and travel distance
    (e) Any floor or stage use restrictions
    (f) Plan and/or section drawing indicating areas where the roof construction is more than 50 ft (15 m) above floor level and areas where sprinkler protection is omitted
    (g) Areas of refuge — interior and exterior

16.4.1.4.4 Engineering Analysis and Calculations. An engineering analysis shall be provided with the following:

(1) Smoke protection analysis to substantiate the use of smoke-protected assembly seating as follows:
    (a) Performance-based design methods approved by the AHJ
    (b) Smoke control requirements per NFPA 92, *Standard for Smoke Control Systems*
    (c) Smoke control assumptions, such as fire scenario description, fire size quantification, and smoke development/smoke movement analysis
    (d) Proposed testing protocol for smoke control system and pass/fail criteria
    (e) Timed egress analysis and assumed flow rates and travel speeds

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(2) Sprinkler protection calculations, including an engineering analysis substantiating locations in accordance with 16.3.5.3 where sprinkler protection would be ineffective due to height and combustible loading
(3) Load diagram of rigging/load capacity of gridiron, fly loft, or long-span roof structure used for hanging overhead objects

16.4.1.5 Life Safety Management Document. The AHJ shall be provided with a life safety management document providing the information required in 16.4.1.5.2 through 16.4.1.5.7.

16.4.1.5.1 Document Distribution. The persons performing the life safety evaluation, the AHJ, the A/E design team, and the building owner shall receive a copy of the life safety management document prior to issuance of the certificate of occupancy.

16.4.1.5.2 Facility Management and Operational Plans. Facility management and operational plans shall address the following:

(1) Best practices adopted or recognized
(2) Emergency plans
(3) Evacuation plans
(4) Shelter-in-place plans, including capacities and protection considerations
(5) Crowd management training plan
(6) Safety plans, which include the following:
    (a) Training plans
    (b) Safety equipment plans
(7) Fire alarm, smoke control system protocol, and testing plans
(8) First aid or medical treatment plans, which include the following:
    (a) Defined levels of service
    (b) Standing orders adopted
    (c) Supply and equipment plan
(9) Housekeeping plans — biological, medical, hazardous materials cleaning
(10) Emergency communication plans, which include the following:
    (a) Chain of authority and incident command system employed
    (b) Contact information for the following:
        i. Venue personnel
        ii. Emergency management and response organizations, such as fire, police, medical, utility, transportation, and key stakeholders
    (c) Communication systems
    (d) Standard announcement for incidents or emergency situations
(11) Risk and threat assessment for venue and surrounding area for the following:
    (a) Severe weather
    (b) Hazardous materials
    (c) Terrorism
    (d) Hostile intruder
(12) Operating procedures and protocols for risks, such as the following:
    (a) Severe weather preparedness and monitoring plans
    (b) Hazardous materials incidence response plans
    (c) Terrorism response plans
    (d) Hostile intruder response plans
(13) First responder response/arrival routes plans
(14) Alcohol management plans
(15) Food safety plans
(16) Rigging and temporary performance structure, which includes the following:
    (a) Design and safety review plans
    (b) Emergency action plans
(17) Chemical and hazardous materials information and data
(18) Barrier and wall protection plans for motor sports or similar events

16.4.1.5.3 Records. Records of the facility management plans, including procedures and location, shall be maintained for the following:

(1) Crowd management training
(2) Safety training
(3) Fire alarm, smoke control system maintenance, and test records
(4) First aid or medical treatment and regulation compliance

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16.4.1.5.4 Building Systems Reference Guide. A building systems reference guide shall be provided in accordance with 16.4.1.5.4.1 through 16.4.1.5.4.3.

16.4.1.5.4.1 A basic life safety building systems reference guide shall be developed and maintained.

16.4.1.5.4.2 The life safety building systems reference guide shall contain the important and key information for the venue management's use when planning events/activities for the safety of patrons, performers/participants, employees, and vendors.

16.4.1.5.4.3 The life safety building systems document in accordance with 16.4.1.4 shall be permitted to be used, and additionally the life safety building systems reference guide shall include the following:

(1) Occupant capacity of every space/room

(2) Egress flow diagrams, including assumed flow rates, and capacities of all aisles and hallways, including public and nonpublic areas

(3) Capacities of all exterior doors and/or choke points in immediate perimeter areas

(4) Limitations or assumptions for ingress control that could be in place during an emergency egress/evacuation, including control gates, queuing barriers, and turnstiles

(5) Capacities of immediate perimeter exterior walkways, including assumed flow rates for exterior areas

(6) Assumed egress paths for normal conditions — transportation modes

(7) Management level sequencing charts for alarm and emergency communication systems, the manual, or override options/instructions that include the following:

(a) List of codes or alarm signals

(b) Location of manual overrides

(c) Description of sequence of operations during an alarm such as exhaust fans operate or doors open

(8) Principal fire and life safety features/strategies, such as sprinklers, smoke control, fire alarm notifications, PA system, emergency power, and fire department access

(9) Assumptions when developing occupancy plans for venue floor, open areas, and nonevent spaces, such as the following:

(a) Event floor plans/setup diagrams for each typical event/activity

(b) Fire sprinkler and smoke protection capabilities

(10) Severe weather shelter areas, locations, structure considerations (limitations), capacities (occupancy and density factor)

(11) Command center, which includes the following:

(a) Location (formal or informal)

(b) Structural integrity considerations

(c) Redundant locations and/or capabilities

(d) Jurisdictional rights — assumed and/or applied

(12) Locations and capacities of wheelchair and mobility-impaired seating

(13) Locations and capacities of areas of refuge and other safe areas

(14) Rigging or structural load capacities of grids, truss structure, fly lofts, ceilings, floors, ramps, and staging

(15) List of locations of emergency equipment such as fire extinguishers, fire hose cabinets, fire hydrants, AEDs

(16) Sequencing of electrical service, such as the following:

(a) Emergency generators and charts of all areas illuminated during power outages

(b) Multiple electrical feed capabilities

(17) List of mechanical, moveable equipment in the facility

(18) Potential hazards in the surrounding neighborhood, including train tracks and propane stations

(19) Assumptions or accommodations considered and used in design

16.4.1.5.5 The facility management plans shall be maintained and adjusted as necessary for changes to the venue structure, operating purposes and style, and event occupancy.

16.4.1.5.6 Facility management and operational plans shall be submitted to the AHJ annually.

16.4.1.5.7 For events and activities at the venue that are outside the normal operating conditions or vary from the normal facility management plans, the following shall apply:

(1) Facility management shall perform an event/activity-specific facility management plan for the AHJ to review.

(2) Approval of the AHJ for the specific facility management plan shall occur prior to such event.

2. No further change to advisory annex text A.16.4.1.1 and A.16.4.1.3

Issue Date: August 14, 2014
Effective Date: September 3, 2014

(**Note: For further information on NFPA Codes and Standards, please see** www.nfpa.org/codelist)
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Public Input No. 23-NFPA 5000-2015 [Global Input]

1. Delete 32.3.7 as follows:

~~**32.3.7** I n addition to the other requirements of Section 32.3, tents used for the retail sales of consumer fireworks, 1.4G, shall comply with NFPA1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles* .~~

Additional Proposed Changes

File Name	Description	Approved
5000-15-3_Log_1140_SC_14-8-36_CONCURRENT_-_TIA_5000-15-3.pdf	NFPA TIA 15-3 Log No. 1140	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from Tentative Interim Amendment No. 15-3 (Log No. 1140) issued by the Standards Council on August 14, 2014 and per the NFPA Regs., needs to be reconsidered by the Technical Committee for the next edition of the Document.

Submitter's Substantiation: Deletes reference to NFPA 1124, or a consumer fireworks provision, or both. Consistent with NFPA Standards Council Decision D#14-1, issued March 3, 2014, NFPA has temporarily withdrawn NFPA 1124, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles. The effect of this decision is that no recognized criteria for the subjects previously governed by NFPA 1124 exist within the NFPA codes and standards system; thus, this TIA works to align NFPA 5000 with that circumstance.

Emergency Nature: NFPA 1124 has been temporarily withdrawn as a result of Standards Council Decision D#14-1, which was issued March 3, 2014, subsequent to completion of the NFPA 5000-2015 Second Draft, but prior to the issuance of NFPA 5000-2015. Accordingly, this TIA is intended to be issued concurrently with NFPA 5000-2015.

Submitter Information Verification

Submitter Full Name: TC ON BLD-SCM
Organization: NFPA 5000 TC on Structures, Construction and Materials
Street Address:
City:
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Submittal Date: Fri Mar 20 09:23:51 EDT 2015

Tentative Interim Amendment

NFPA 5000®

Building Construction and Safety Code ®

2015 Edition

Reference: 32.3.7
TIA 15-3
(SC 14-8-36 / TIA Log #1140)

Note: Text of the TIA issued and incorporated into the text of the document, therefore no separate publication is necessary.

1. Delete 32.3.7 as follows:

~~**32.3.7** In addition to the other requirements of Section 32.3, tents used for the retail sales of consumer fireworks, 1.4G, shall comply with NFPA1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles*.~~

Issue Date: August 14, 2014
Effective Date: September 3, 2014

(**Note: For further information on NFPA Codes and Standards, please see** www.nfpa.org/codelist)
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Public Input No. 4-NFPA 5000-2015 [Global Input]

Throughout standard remove references to the following and replace with the following:

(1) ACI 216.1/TMS 0216.1 and replace with ACI 216.1.

(2) ANSI/UL and replace with UL.

(3) ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors and replace with ANSI/BHMA A156.10 Power Operated Pedestrian Doors.

(4) ASHRAE # and replace with ASHRAE STD #.

(5) Handbook of Fundamentals and replace with Handbook - Fundamentals.

(6) ANSI/ASHRAE 15, Safety Standard for Refrigeration Systems and replace with ASHRAE STD 15 & 34, Safety Standard for Refrigeration Systems, 2015.

(7) BHMA/ANSI A156.19, American National Standard for Power Assist and Low Energy Power Oprerated Doors and replace with BHMA/ANSI A156.19, Power Assist and Low Energy Power Oprerated Doors.

(8) FM # and replace with FM Approval #.

(9) ANSI/FM 4880 American National Standard for Evaluating Insulated Wall or Wall and Roof/Ceiling Assemblies, Plastic Interior Finish Materials, Plastic Exterior Building Panels, Wall/Ceiling Coating Systems, Interior or Exterior Finish Systems and replace with FM Approval 4880 Class 1 Fire Rating of Insulated Wall or Wall and Roof/Ceiling Panels, Interior Finish Materials or Coatings and Exterior Wall Systems.

(10) FM 4435 Approval Standard for Roof Perimeter Flashing and replace FM Approval 4435, Edge Systems Used With Low Slope Roofing Systems.

(11) ICC/ANSI A177.1 American National Standard for Assessible and Usable Buildings and Facilities and replace with ICC/ANSI A117.1 Assessible and Usable Buildings and Facilities.

(12) IEC 60364-1 Electrical Installation of Buildings, and replace with IEC 60364-1 Low-Voltage Electrical Installations - Part 1: Fundamental Principles, Assessment of General Characteristics, Definitions.

(13) ACI 506.2 Specification for Materials, Proportioning, and Application of Shotcrete and replace with ACI 506.2 Specification for Shotcrete.

(14) ACI 530/ASCE 5/TMS 402 and replace with ACI 530/530.1.

(15) American Society of Mechanical Engineers and replace with ASME International.

(16) American Wood Preservers Association and replace with American Wood Protection Association.

(17) C4 and so on under American Wood Protection Association and replace with AWPA C4 and so on.

(18) GA 600 Fire Resistance Design Manual and replace GA-600 Fire Resistance Design Manual Sound Control.

(19) Safety Library Publication No. 2 and replace with IME SLP 2.

(20) Design and Construction of Post-Tensioned Slabs-on-Ground and replace with PTI DC10.1 Design and Construction of Post-Tensioned Slabs-On-Ground.

(21) Design of Slabs-on-Ground Foundations and replace with TF 700-R Design of Slabs-on-Ground.

Statement of Problem and Substantiation for Public Input

The recommended revisions correlate with PI-1 and PI-3.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1-NFPA 5000-2015 [Section No. 2.3]	Referenced current SDO names, addresses, standard names, numbers, and editions.
Public Input No. 3-NFPA 5000-2015 [Chapter H]	Referenced current SDO names, addresses, standard names, numbers, and editions.

Submitter Information Verification

Submitter Full Name: Aaron Adamczyk
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City:
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Submittal Date: Fri Feb 13 17:20:40 EST 2015

Public Input No. 170-NFPA 5000-2015 [Section No. 1.3.1]

1.3.1 * Buildings and Structures.

~~The~~ Other than buildings used for the retail sales and associated storage of consumer fireworks, the provisions of the *Code* shall apply to the construction, alteration, repair, equipment, use and occupancy, maintenance, relocation, and demolition of every building or structure, or any appurtenances connected or attached to such buildings or structures within the jurisdiction.

Statement of Problem and Substantiation for Public Input

Standards Council Decision #14-1 directed the NFPA Technical Committees to discontinue requirements for the storage and retail sales of consumer fireworks. The Council then directed and subsequently issued a series of TIA's removing any requirements for consumer fireworks from NFPA codes and standards. Unfortunately the TIA's did not accomplish the intent of the Council Decision; but rather, created an unacceptable situation in which consumer fireworks are currently treated as ordinary hazard contents by the various NFPA codes and standards. Instead of not addressing the retail sales of consumer fireworks, NFPA 5000 now treats such facilities as a mercantile occupancy with ordinary hazard contents. In order to accomplish the directive issued by the Council, the storage and retail sales of consumer fireworks needs to be specifically excluded from the scope of NFPA 5000.

While the APA continues to believe that the Council Decision was based on false and misleading information and that the resulting action is contrary to NFPA's mission of "eliminating death, injury, property and economic loss due to fire, electrical and related hazards", the APA submits the Public Input to correct the errors made in implementing the Council Decision.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 171-NFPA 5000-2015 [New Section after A.1.2]	

Submitter Information Verification

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Submittal Date: Mon Jul 06 07:54:02 EDT 2015

Public Input No. 111-NFPA 5000-2015 [Section No. 1.7.5.2.2]

1.7.5.2.2 Existing Installations.

Buildings in existence at the time of the adoption of this *Code* shall be permitted to have their existing use or occupancy continued if such use or occupancy was legal at the time of the adoption of this *Code*, provided that such continued use is not ~~dangerous to life~~ deemed an unsafe building or fire hazard .

Statement of Problem and Substantiation for Public Input

The term “not dangerous to life” is subjective. Section 1.7.5.3.1.1 describes Unsafe Buildings. And Section 1.7.5.3.1.2 describes Fire Hazards. The two descriptions are comprehensive and if will provide consistent enforcement.

Submitter Information Verification

Submitter Full Name: Jim Muir
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Submittal Date: Sat Jul 04 16:43:36 EDT 2015

Public Input No. 113-NFPA 5000-2015 [Section No. 1.7.6.3.3.4]

1.7.6.3.3.4

Deferred submittal of construction documents shall be approved by the authority having jurisdiction prior to the issuance of a building permit. The RDP for design shall identify all deferred submittals in writing with the application for permit. ~~Construction documents for deferred submittal items~~ All documents prepared by people other than the RDP shall be reviewed by the RDP ~~for design for general conformance to the RDP's design~~ and ~~then submitted to the authority having jurisdiction. Deferred~~ submitted with a letter indicating that they have been reviewed and found to be in conformance with the regulations for the design of the building. Deferred submittal items shall not be installed until their performance requirements and construction documents have been approved by the authority having jurisdiction.

Statement of Problem and Substantiation for Public Input

Currently there is no requirement for evidence that the RDP has in fact reviewed the deferred submittal. This change requires written endorsement from the RDP that the deferred submittals are in conformance with their design.

Submitter Information Verification

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Submittal Date: Sat Jul 04 16:46:12 EDT 2015

Public Input No. 174-NFPA 5000-2015 [Section No. 2.2]

2.2 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 1, *Fire Code* , 2015 edition

NFPA 4, *Standard for Integrated Fire Protection and Life Safety System Testing,* 2015 edition .

NFPA 10, *Standard for Portable Fire Extinguishers,* 2013 edition.

NFPA 11, *Standard for Low-, Medium-, and High-Expansion Foam,* 2010 edition.

NFPA 12, *Standard on Carbon Dioxide Extinguishing Systems,* 2011 edition.

NFPA 12A, *Standard on Halon 1301 Fire Extinguishing Systems,* 2009 edition.

NFPA 13, *Standard for the Installation of Sprinkler Systems,* 2013 edition.

NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes,* 2013 edition.

NFPA 13R, *Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies,* 2013 edition.

NFPA 14, *Standard for the Installation of Standpipe and Hose Systems,* 2013 edition.

NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection,* 2012 edition.

NFPA 16, *Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems,* 2011 edition.

NFPA 17, *Standard for Dry Chemical Extinguishing Systems,* 2013 edition.

NFPA 17A, *Standard for Wet Chemical Extinguishing Systems,* 2013 edition.

NFPA 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances,* 2013 edition.

NFPA 30, *Flammable and Combustible Liquids Code,* 2015 edition.

NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages,* 2015 edition.

NFPA 30B, *Code for the Manufacture and Storage of Aerosol Products,* 2015 edition.

NFPA 31, *Standard for the Installation of Oil-Burning Equipment,* 2011 edition.

NFPA 32, *Standard for Drycleaning Plants,* 2011 edition.

NFPA 33, *Standard for Spray Application Using Flammable or Combustible Materials,* 2011 edition.

NFPA 34, *Standard for Dipping, Coating, and Printing Processes Using Flammable or Combustible Liquids,* 2011 edition.

NFPA 35, *Standard for the Manufacture of Organic Coatings,* 2011 edition.

NFPA 36, *Standard for Solvent Extraction Plants,* 2013 edition.

NFPA 37, *Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines,* 2015 edition.

NFPA 40, *Standard for the Storage and Handling of Cellulose Nitrate Film,* 2011 edition.

NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals,* 2011 edition.

NFPA 51, *Standard for the Design and Installation of Oxygen–Fuel Gas Systems for Welding, Cutting, and Allied Processes,* 2013 edition.

NFPA 51A, *Standard for Acetylene Cylinder Charging Plants,* 2012 edition.

NFPA 52, *Vehicular Gaseous Fuel Systems Code,* 2013 edition.

NFPA 54, *National Fuel Gas Code,* 2015 edition.

NFPA 55, *Compressed Gases and Cryogenic Fluids Code,* 2013 edition.

NFPA 58, *Liquefied Petroleum Gas Code,* 2014 edition.

NFPA 59A, *Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG),* 2013 edition.

NFPA 61, *Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities,* 2013 edition.

NFPA 69, *Standard on Explosion Prevention Systems,* 2014 edition.

NFPA 70® , *National Electrical Code®,* 2014 edition.

NFPA 72® , *National Fire Alarm and Signaling Code,* 2013 edition.

NFPA 75, *Standard for the Fire Protection of Information Technology Equipment,* 2013 edition.

NFPA 80, *Standard for Fire Doors and Other Opening Protectives,* 2013 edition.

NFPA 82, *Standard on Incinerators and Waste and Linen Handling Systems and Equipment,* 2014 edition.

NFPA 85, *Boiler and Combustion Systems Hazards Code,* 2011 edition.

NFPA 88A, *Standard for Parking Structures,* 2015 edition.

NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems,* 2015 edition.

NFPA 90B, *Standard for the Installation of Warm Air Heating and Air-Conditioning Systems,* 2015 edition.

NFPA 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids,* 2010 edition.

NFPA 92, *Standard for Smoke Control Systems,* 2012 edition.

NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations,* 2014 edition.

NFPA 99, *Health Care Facilities Code,* 2015 edition.

NFPA 99B, *Standard for Hypobaric Facilities,* 2015 edition.

NFPA *101®* , *Life Safety Code®,* 2015 edition.

NFPA 105, *Standard for Smoke Door Assemblies and Other Opening Protectives,* 2013 edition.

NFPA 110, *Standard for Emergency and Standby Power Systems,* 2013 edition.

NFPA 111, *Standard on Stored Electrical Energy Emergency and Standby Power Systems,* 2013 edition.

NFPA 120, *Standard for Fire Prevention and Control in Coal Mines,* 2010 edition.

NFPA 140, *Standard on Motion Picture and Television Production Studio Soundstages, Approved Production Facilities, and Production Locations,* 2013 edition.

NFPA 150, *Standard on Fire and Life Safety in Animal Housing Facilities,* 2013 edition.

NFPA 170, *Standard for Fire Safety and Emergency Symbols,* 2012 edition.

NFPA 204, *Standard for Smoke and Heat Venting,* 2012 edition.

NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel–Burning Appliances,* 2013 edition.

NFPA 214, *Standard on Water-Cooling Towers,* 2011 edition.

NFPA 220, *Standard on Types of Building Construction,* 2015 edition.

NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations,* 2013 edition.

NFPA 252, *Standard Methods of Fire Tests of Door Assemblies,* 2012 edition.

NFPA 253, *Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source,* 2011 edition.

NFPA 257, *Standard on Fire Test for Window and Glass Block Assemblies,* 2012 edition.

NFPA 259, *Standard Test Method for Potential Heat of Building Materials,* 2013 edition.

NFPA 262, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces,* 2011 edition.

NFPA 265, *Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile or Expanded Vinyl Wall Coverings on Full Height Panels and Walls,* 2011 edition.

NFPA 268, *Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source,* 2012 edition.

NFPA 275, *Standard Method of Fire Tests for the Evaluation of Thermal Barriers,* 2013 edition.

NFPA 285, *Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components,* 2012 edition.

NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth,* 2011 edition.

NFPA 288, *Standard Methods of Fire Tests of Horizontal Fire Door Assemblies Installed in Horizontal Fire Resistance–Rated Assemblies,* 2012 edition.

NFPA 289, *Standard Method of Fire Test for Individual Fuel Packages,* 2013 edition.

NFPA 303, *Fire Protection Standard for Marinas and Boatyards,* 2011 edition.

NFPA 307, *Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves,* 2011 edition.

NFPA 318, *Standard for the Protection of Semiconductor Fabrication Facilities,* 2015 edition.

NFPA 400, *Hazardous Materials Code,* 2013 edition.

NFPA 407, *Standard for Aircraft Fuel Servicing,* 2012 edition.

NFPA 409, *Standard on Aircraft Hangars,* 2011 edition.

NFPA 415, *Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways,* 2013 edition.

NFPA 418, *Standard for Heliports,* 2011 edition.

NFPA 423, *Standard for Construction and Protection of Aircraft Engine Test Facilities,* 2016 edition.

NFPA 484, *Standard for Combustible Metals,* 2015 edition.

NFPA 495, *Explosive Materials Code,* 2013 edition.

NFPA 501, *Standard on Manufactured Housing,* 2013 edition.

NFPA 502, *Standard for Road Tunnels, Bridges, and Other Limited Access Highways,* 2014 edition.

NFPA 560, *Standard for the Storage, Handling, and Use of Ethylene Oxide for Sterilization and Fumigation,* 2007 edition.

NFPA 654, *Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids,* 2013 edition.

NFPA 655, *Standard for Prevention of Sulfur Fires and Explosions,* 2012 edition.

NFPA 664, *Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities,* 2012 edition.

NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films,* 2010 edition.

NFPA 703, *Standard for Fire Retardant–Treated Wood and Fire-Retardant Coatings for Building Materials,* 2015 edition.

NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response,* 2012 edition.

NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment,* 2015 edition.

NFPA 731, *Standard for the Installation of Electronic Premises Security Systems,*2015 edition.

NFPA 750, *Standard on Water Mist Fire Protection Systems,* 2015 edition.

NFPA 801, *Standard for Fire Protection for Facilities Handling Radioactive Materials,* 2014 edition.

NFPA 804, *Standard for Fire Protection for Advanced Light Water Reactor Electric Generating Plants,* 2010 edition.

NFPA 805, *Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants,* 2010 edition.

NFPA 820, *Standard for Fire Protection in Wastewater Treatment and Collection Facilities,* 2012 edition.

NFPA 853, *Standard for the Installation of Stationary Fuel Cell Power Systems,* 2015 edition.

NFPA 900, *Building Energy Code,* 2013 edition.

NFPA 909, *Code for the Protection of Cultural Resource Properties — Museums, Libraries, and Places of Worship,* 2013 edition.

NFPA 914, *Code for Fire Protection of Historic Structures,* 2010 edition.

NFPA 1125, *Code for the Manufacture of Model Rocket and High Power Rocket Motors,* 2012 edition.

NFPA 1144, *Standard for Reducing Structure Ignition Hazards from Wildland Fire,* 2013 edition.

NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems,* 2013 edition.

NFPA 2001, *Standard on Clean Agent Fire Extinguishing Systems,* 2012 edition.

Statement of Problem and Substantiation for Public Input

If PI 172, which adds a requirement to perform testing of integrated systems is accepted, there should be a reference to NFPA 4 in Chapter 2.

Related Public Inputs for This Document

Related Input	Relationship

Public Input No. 172-NFPA 5000-2015 [Section No. 55.1.4]	Adds reference if PI 172 is accepted.

Submitter Information Verification

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Public Input No. 177-NFPA 5000-2015 [Section No. 2.2]

2.2 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 1, *Fire Code* , 2015 edition.

NFPA 10, *Standard for Portable Fire Extinguishers,* 2013 edition.

NFPA 11, *Standard for Low-, Medium-, and High-Expansion Foam,* 2010 edition.

NFPA 12, *Standard on Carbon Dioxide Extinguishing Systems,* 2011 edition.

NFPA 12A, *Standard on Halon 1301 Fire Extinguishing Systems,* 2009 edition.

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NFPA 72® , *National Fire Alarm and Signaling Code,* 2013 edition.

NFPA 75, *Standard for the Fire Protection of Information Technology Equipment,* 2013 edition.

NFPA 80, *Standard for Fire Doors and Other Opening Protectives,* 2013 edition.

NFPA 82, *Standard on Incinerators and Waste and Linen Handling Systems and Equipment,* 2014 edition.

NFPA 85, *Boiler and Combustion Systems Hazards Code,* 2011 edition.

NFPA 88A, *Standard for Parking Structures,* 2015 edition.

NFPA ~~90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems,* 2015 edition.~~

~~NFPA 90B, *Standard for the Installation of Warm Air Heating and Air-Conditioning Systems,* 2015 edition.~~

~~NFPA~~ 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids,* 2010 edition.

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NFPA 99, *Health Care Facilities Code,* 2015 edition.

NFPA 99B, *Standard for Hypobaric Facilities,* 2015 edition.

NFPA *101®* , *Life Safety Code®,* 2015 edition.

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NFPA 110, *Standard for Emergency and Standby Power Systems,* 2013 edition.

NFPA 111, *Standard on Stored Electrical Energy Emergency and Standby Power Systems,* 2013 edition.

NFPA 120, *Standard for Fire Prevention and Control in Coal Mines,* 2010 edition.

NFPA 140, *Standard on Motion Picture and Television Production Studio Soundstages, Approved Production Facilities, and Production Locations,* 2013 edition.

NFPA 150, *Standard on Fire and Life Safety in Animal Housing Facilities,* 2013 edition.

NFPA 170, *Standard for Fire Safety and Emergency Symbols,* 2012 edition.

NFPA 204, *Standard for Smoke and Heat Venting,* 2012 edition.

NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel–Burning Appliances,* 2013 edition.

NFPA 214, *Standard on Water-Cooling Towers,* 2011 edition.

NFPA 220, *Standard on Types of Building Construction,* 2015 edition.

NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations,* 2013 edition.

NFPA 252, *Standard Methods of Fire Tests of Door Assemblies,* 2012 edition.

NFPA 253, *Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source,* 2011 edition.

NFPA 257, *Standard on Fire Test for Window and Glass Block Assemblies,* 2012 edition.

NFPA 259, *Standard Test Method for Potential Heat of Building Materials,* 2013 edition.

NFPA 262, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces,* 2011 edition.

NFPA 265, *Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile or Expanded Vinyl Wall Coverings on Full Height Panels and Walls,* 2011 edition.

NFPA 268, *Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source,* 2012 edition.

NFPA 275, *Standard Method of Fire Tests for the Evaluation of Thermal Barriers,* 2013 edition.

NFPA 285, *Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components,* 2012 edition.

NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth,* 2011 edition.

NFPA 288, *Standard Methods of Fire Tests of Horizontal Fire Door Assemblies Installed in Horizontal Fire Resistance–Rated Assemblies,* 2012 edition.

NFPA 289, *Standard Method of Fire Test for Individual Fuel Packages,* 2013 edition.

NFPA 303, *Fire Protection Standard for Marinas and Boatyards,* 2011 edition.

NFPA 307, *Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves,* 2011 edition.

NFPA 318, *Standard for the Protection of Semiconductor Fabrication Facilities,* 2015 edition.

NFPA 400, *Hazardous Materials Code,* 2013 edition.

NFPA 407, *Standard for Aircraft Fuel Servicing,* 2012 edition.

NFPA 409, *Standard on Aircraft Hangars,* 2011 edition.

NFPA 415, *Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways,* 2013 edition.

NFPA 418, *Standard for Heliports,* 2011 edition.

NFPA 423, *Standard for Construction and Protection of Aircraft Engine Test Facilities,* 2016 edition.

NFPA 484, *Standard for Combustible Metals,* 2015 edition.

NFPA 495, *Explosive Materials Code,* 2013 edition.

NFPA 501, *Standard on Manufactured Housing,* 2013 edition.

NFPA 502, *Standard for Road Tunnels, Bridges, and Other Limited Access Highways,* 2014 edition.

NFPA 560, *Standard for the Storage, Handling, and Use of Ethylene Oxide for Sterilization and Fumigation,* 2007 edition.

NFPA 654, *Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids,* 2013 edition.

NFPA 655, *Standard for Prevention of Sulfur Fires and Explosions,* 2012 edition.

NFPA 664, *Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities,* 2012 edition.

NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films,* 2010 edition.

NFPA 703, *Standard for Fire Retardant–Treated Wood and Fire-Retardant Coatings for Building Materials,* 2015 edition.

NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response,* 2012 edition.

NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment,* 2015 edition.

NFPA 731, *Standard for the Installation of Electronic Premises Security Systems,*2015 edition.

NFPA 750, *Standard on Water Mist Fire Protection Systems,* 2015 edition.

NFPA 801, *Standard for Fire Protection for Facilities Handling Radioactive Materials,* 2014 edition.

NFPA 804, *Standard for Fire Protection for Advanced Light Water Reactor Electric Generating Plants,* 2010 edition.

NFPA 805, *Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants,* 2010 edition.

NFPA 820, *Standard for Fire Protection in Wastewater Treatment and Collection Facilities,* 2012 edition.

NFPA 853, *Standard for the Installation of Stationary Fuel Cell Power Systems,* 2015 edition.

NFPA 900, *Building Energy Code,* 2013 edition.

NFPA 909, *Code for the Protection of Cultural Resource Properties — Museums, Libraries, and Places of Worship,* 2013 edition.

NFPA 914, *Code for Fire Protection of Historic Structures,* 2010 edition.

NFPA 1125, *Code for the Manufacture of Model Rocket and High Power Rocket Motors,* 2012 edition.

NFPA 1144, *Standard for Reducing Structure Ignition Hazards from Wildland Fire,* 2013 edition.

NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems,* 2013 edition.

NFPA 2001, *Standard on Clean Agent Fire Extinguishing Systems,* 2012 edition.

Statement of Problem and Substantiation for Public Input

The requirements within the IAPMO Uniform Mechanical Code which is adopted as a mandatory referenced standard in Section 2.2.23 compressively govern all aspects of building ventilation for new buildings and systems. As such there is no need to adopt NFPA 90A and NFPA 90B which only address limited features of those same systems. Relying solely on the IAPMO Mechanical Code, will provide a single source and eliminate overlapping requirements that differ slightly or contradict each other.

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Public Input No. 1-NFPA 5000-2015 [Section No. 2.3]

2.3 Other Publications.

2.3.1 AA Publications.

Aluminum Association, Inc., 1525 Wilson Blvd., Suite 600, Arlington, VA 22209.

Aluminum Design Manual: Part 1A, *Aluminum Structures, Allowable Stress Design*, and Part 1-B, *Aluminum Structures, Load and Resistance Factor Design of Buildings and Similar Type Structures*, ~~2000~~ **2015** .

2.3.2 ACI Publications.

American Concrete Institute,~~ P.O. Box 9094~~ **38800 Country Club Drive** , Farmington Hills, MI ~~48333~~ **48331 -** ~~9094~~ **3434** .

ACI 216.1/~~TMS 0216.1~~ , *Code Requirements for Determining Fire Resistance of Concrete and Masonry Construction Assemblies,*~~ 2008~~ **2014** .

ACI 318, *Building Code Requirements for Structural Concrete*, ~~(ACI 318, 2005) and Commentary (ACI 318R, 2005), 2011~~ **2014** .

ACI 506.2, *Specification for ~~Materials, Proportioning, and Application of~~ Shotcrete*, ~~1995~~ **2013** .

ACI 530/~~ASCE 5/TMS 402~~ **530.1** , *Building Code Requirements for Masonry Structures*, ~~2005~~ **2013** .

ACI 530.1/ASCE 6/TMS 602, *Specification for Masonry Structures*, 2005. **(See above for same document)**

2.3.3 AISC Publications.

American Institute of Steel Construction, One East Wacker Drive, Suite ~~3100~~ **700** , Chicago, IL 60601-~~2001~~ **1802** .

~~ANSI/~~ AISC 341, *Seismic Provisions for Structural Steel Buildings*, 2010.~~ANSI/~~

AISC 360, *Specification for Structural Steel Buildings*, 2010**, Errata, 2012** .

2.3.4 AISI Publications.

American Iron and Steel Institute, 25 Massachusetts Avenue N.W., Suite 800, Washington, DC 20001-1431.

AISI-S100, *North American Specification for the Design of Cold-Formed Steel Structural Members*, 2012**, Errata, 2014** .

AISI-S110, *Standard for Seismic Design of Cold-Formed Steel Structural Systems—Special Bolted Moment Frames*, 2007, including Supplement 1, dated 2009, ~~(~~ Reaffirmed 2012~~)~~ .

AISI-S200, *North American Standard for Cold-Formed Steel Framing — General Provisions*, 2012.

AISI-S210, *North American Standard for Cold-Formed Steel Framing — Floor and Roof System Design*, 2007, ~~(~~ Reaffirmed 2012~~)~~ .

AISI-S211, *North American Standard for Cold-Formed Steel Framing — Wall Stud Design*, 2007, including Supplement 1, dated 2012, ~~(~~ Reaffirmed 2012~~)~~ .

AISI-S212, *North American Standard for Cold-Formed Steel Framing — Header Design*, 2007, ~~(~~ Reaffirmed 2012~~)~~ .

AISI-S213, *North American Standard for Cold-Formed Steel Framing — Lateral Design*, 2007, including Supplement 1, dated 2009, ~~(~~ Reaffirmed 2012~~)~~ .

AISI-S214, *North American Standard for Cold-Formed Steel Framing — Truss Design*, 2012.

AISI-S220, *North American Standard for Cold-Formed Steel Framing — Nonstructural Members*, 2011.

AISI-S230, *Standard for Cold-Formed Steel Framing — Prescriptive Method for One- and Two-Family Dwellings*, 2007, including Supplement 3, dated 2012, ~~(~~ Reaffirmed 2012~~)~~ .

2.3.5 AITC Publications.

American Institute of Timber Construction, 7012 S. Revere Parkway, Suite 140, Centennial, CO 80112.

ANSI/AITC A190.1, *American National Standard, Structural Glued Laminated Timber,* ~~2002~~ 200 **7** .

2.3.6 ANSI Publications.

American National Standards Institute, Inc., 25 West 43rd Street, 4th floor, New York, NY 10036.

ANSI A14.3, **Ladders - Fixed - Safety Requirements** ~~for Fixed Ladders~~ , ~~2002~~ 200 **8** .

ANSI A208.1, *Standard for Particleboard*, 1999.

ANSI A1264.1, *Safety Requirements for Workplace Floor and Wall Openings, Stairs and Railing Systems*, 2007.

ANSI Z 97.1, *Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test*, ~~2004~~ 200 **9, Errata, 2013** .

2.3.7 ASCE Publications.

American Society of Civil Engineers, 1801 Alexander Bell Drive, Reston, VA 20191-4400.

ASCE/SEI 7**-10** , *Minimum Design Loads for Buildings and Other Structures*, 2010, including Supplement ~~2, 2012~~ **1, and revised Commentary, 2013** .

ASCE/SEI 8, *Standard Specification for the Design of Cold-Formed Stainless Steel Structural Members*, 2003.

ASCE/SEI 17, *Air Supported Structures*, 1996. **(Out of Print, No Longer Available)**

ASCE/SEI 19, *Structural Applications of Steel Cables for Buildings*, 2010.

ASCE/SEI 24**-14** , *Flood Resistant Design and Construction,* ~~2005~~ **2014** .

ASCE/SFPE 29, *Standard Calculation Methods for Structural Fire Protection*, ~~2005~~ 200 **7** .

ASCE/SEI 31, *Seismic Evaluation of Existing Buildings*, 2003.

ASCE 41, Seismic Evaluation And Retrofit Of Existing Buildings, 2013. (Supersedes FEMA 356)

2.3.8 ASHRAE Publications.

American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., 1791 Tullie Circle, NE, Atlanta, GA 30329-2305.

ASHRAE, *Handbook ~~of~~ - Fundamentals*, ~~2009~~ 20 **13** .

ASHRAE ~~55~~ **STD** 55 , *Thermal Environmental Conditions for Human Occupancy*, ~~2010~~ 201 **3, Errata, 2015** .

ASHRAE **STD** 62.1, *Ventilation for Acceptable Indoor Air Quality*, ~~2010 with addenda a, c, d, and e.ANSI/IES/ASHRAE~~ **2013, Errata, 2014** .

ASHRAE **STD** 90.1 **IP** , *Energy Standard for Buildings Except Low-Rise Residential Buildings*, ~~2010.~~ **2013, Errata, 2014** . **(Supersedes ANSI/ IES/ ASHRAE 90. 1)**

ASHRAE **STD** 90. 2, *Energy-Efficient Design of Low-Rise Residential Buildings*, 2007, including approved addendum b.

~~ANSI/~~ ASHRAE **STD** 15 **& 34** , *Safety Standard for Refrigeration Systems*, ~~2010.~~ 201 **5** . **(This is a combined standard)**

2.3.9 ASME Publications.

~~American Society of Mechanical Engineers~~ **ASME International** , Two Park Avenue, New York, NY 10016-5990.

ASME A17.1/CSA B 44, *Safety Code for Elevators and Escalators*, ~~2007~~ **2013** .

ASME A17.7/CSA B 44.7, *Performance-Based Safety Code for Elevators and Escalators*, 2007**, Reaffirmed 2012** .

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ASTM ~~F 547~~ F547 , *Standard Terminology of Nails for Use with Wood and Wood-Base Materials*, 2006**, Reapproved 2012** .

ASTM ~~F 851~~ F851 , *Standard Test Method for Self-Rising Seat Mechanisms*, 1987~~ (2005)~~ **, Reapproved 2013 .**

ASTM ~~F 1292~~ F1292 , *Standard Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment*, ~~2009~~ **2013** .

ASTM ~~F 1577~~ F1577 , *Standard Test Methods for Detention Locks for Swinging Doors*, 2005**, Reapproved 2012** .

ASTM ~~F 1667~~ F1667 , *Standard Specification for Driven Fasteners: Nails, Spikes, and Staples*, ~~2005~~ **2013** .

ASTM ~~F 1951~~ F1951 , *Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment*, ~~2009b~~ **2014** .

2.3.12 AWC Publications.

American Wood Council, 222 Catoctin Circle SE #201, Leesburg, VA 20175.

ANSI/AWC NDS, *National Design Specifications (NDS) for Wood Construction*, ~~2012~~ **2015**.

AWC NDS Supplement, *NDS Supplement — Design Values for Wood Construction*, ~~2012~~ **2015**.

AWC PWF, *Permanent Wood Foundation Design Specification*, ~~2007~~ **2015**.

AWC SDPWS, *Special Design Provisions for Wind and Seismic*, ~~2008~~ **2015**.

AWC *Span Tables for Joists and Rafters,* 2012.

AWC Wood Construction Data No. 4, *Plank and Beam Framing for Residential Buildings,* 2003.

ANSI/AWC WFCM, *Wood Frame Construction Manual for One- and Two-Family Dwellings,* ~~2012~~ **2015**.

2.3.13 AWPA Publications.

American ~~Wood Preservers~~ Wood **Protection** Association, P.O. Box ~~388~~ **361784**, ~~Selma~~ **Birmingham**, AL ~~36702~~ **35236** - ~~0388~~ **1784**.

C1, *Standard for Preservative Treatment of All Timber Products by Pressure Processes,* 2003. **(Withdrawn standard)**

AWPA C2, *Standard for the Preservative Treatment of Lumber, Timber, Bridge Ties, and Mine Ties by Pressure Processes,* 2002.

AWPA C3, *Piles— Preservative Treatment by Pressure Processes,* 2003.

AWPA C4, *Poles— Preservative Treatment by Pressure Processes,* 2003.

AWPA C9, *Plywood— Preservative Treatment by Pressure Processes,* 2003.

AWPA C14, *Wood for Highway Construction — Preservative Treatment by Pressure Processes,* 2003.

AWPA C15, *Wood for Commercial-Residential Construction — Preservative Treatment by Pressure Processes,* 2003.

AWPA C16, *Wood Used on Farms — Preservative Treatment by Pressure Processes,* 2003.

AWPA C22, *Lumber and Plywood for Permanent Wood Foundations — Preservative Treatment by Pressure Processes,* 2003.

AWPA C23, *Round Poles and Posts Used in Building Construction — Preservative Treatment by Pressure Processes,* 2003.

AWPA C24, *Sawn Timber Piles Used for Residential and Commercial Building,* 2003.

AWPA C28, *Standard for Preservative Treatment of Structural Glued Laminated Members and Lamination Before Gluing of Southern Pine, Coastal Douglas Fir, Hemfir, and Western Hemlock by Pressure Processes*, 2003.

AWPA C31, *Lumber Used Out of Contact with the Ground and Continuously Protected from Liquid Water—Treatment by Pressure Processes*, 2002.

AWPA C33, *Standard for Preservative Treatment of Structural Composite Lumber by Pressure Processes*, 2003.

AWPA M4, *Standard for the Care of Preservative-Treated Wood Products,* ~~2006~~ **2011**.

AWPA P1/P13, *Standard for Creosote Preservative,* ~~2006~~ **2013**.

AWPA P2, *Standard for Creosote Solutions,* ~~2006~~ **2013**.

AWPA P5, *Standard for Waterborne Preservatives,* ~~2006~~ **2014**.

AWPA P8, *Standard for Oil-borne Preservatives,* ~~2006~~ **2014**.

AWPA P9, *Standards for Solvents and Formulations for Organic Preservative Systems,* ~~2006~~ **2010**.

2.3.14 BHMA Publications.

Builders Hardware Manufacturers Association, 355 Lexington Avenue, ~~17th~~ **15** th floor, New York, NY 10017-6603.

ANSI/BHMA A156.3, *Exit Devices*, ~~2008~~ **2014**.

BHMA/ANSI A156.19, ~~*American National Standard for*~~ *Power Assist and Low Energy Power Operated Doors*, ~~2007~~ **2013**.

2.3.15 CGSB Publications.

Canadian General Standards Board, ~~CGSB Sales Centre,~~ **Place du Portage III, 6B1** , 11 Laurier St., Gatineau, ~~PQ~~ **Quebec** , K1A 1G6 **Canada** ~~K1A 1G6~~ .

37-GP-52M, *Roofing and Waterproofing Membrane, Sheet Applied, Elastomeric,* 2005.

37-GP-56M, *Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing,* 1985. **(Withdrawn 2013)**

CAN/CGSB-37.54, *Polyvinyl Chloride Roofing and Waterproofing Membrane,* 1995. **(Withdrawn 2012)**

2.3.16 Composite Panel Association Publications.

Composite Panel Association, Composite Wood Council, ~~18922 Premiere Court, Gaithersburg, MD 20879-1574~~ **19465 Deerfield Avenue, Suite 306, Leesburg, VA 20176** .

ANSI/~~AHA~~ **CPA** A135.4, *Basic Hardboard,* ~~2004~~ **2012** .

ANSI/~~AHA~~ **CPA** A135.5, *Prefinished Hardboard Paneling*, ~~2004~~ **2012** .

ANSI/~~AHA~~ **CPA** A135.6, *Hardboard Siding,* ~~2006~~ **2012** .

2.3.17 DASMA Publications.

Door and Access Systems Manufacturers Association, International, 1300 Summer Avenue, Cleveland, OH 44115-2851.

ANSI/DASMA 107, *Room Fire Test Standard for Garage Doors Using Foam Plastic Insulation,* 2004**, Revised 2012** .

2.3.18 EIMA Publications.

EIFS Industry Members Association, ~~3000 Corporate Center Drive~~ **513 Broad Street , Suite** ~~270~~ **210 ,** ~~Morrow, GA 30260~~ **Falls Church, VA 22046-3257** .

ANSI/EIMA 99A, *Exterior Insulation and Finish Systems (EIFS)*, 2001.

2.3.19 FM Global Publications.

FM Global, 270 Central Avenue, P.O. Box 7500, Johnston, RI 02919-4923.

~~FM 4411~~ FM **Approval** 4411 , *Insulated Wall Constructions,* 1974.

~~FM 4435, *Approval Standard for Roof Perimeter Flashing,* 2004.~~

~~FM 4450, Approval Standard for~~ FM **Approval** 4435, **Edge Systems Used With Low Slope Roofing Systems** , , **2013** .

FM **Approval** 4450, *Class I Insulated Steel Deck Roofs,* 1989.

~~FM 4470, Approval Standard for~~ FM **Approval** 4470, *Single-Ply, Polymer-modified Bitumen Sheet, Built-up Roof (BUR) and Liquid Applied Roof Covers for use in Class I and Non-combustible Roof Deck Construction,* 2010.

~~FM 4471, Approval Standard for~~ FM **Approval** 4471, *Class 1 Panel Roofs,* 2010.

~~ANSI/FM 4473~~ FM **Approval** 4473 , *Test Standard for Impact Resistance Testing of Rigid Roofing Materials by Impacting with Freezer Ice Balls,* 2011.

~~ANSI/~~ FM ~~4880, American National Standard for Evaluating Insulated Wall or Wall and~~ **Approval** 4880, **Class 1 Fire Rating Of Insulated Wall Or Wall And** **Roof/Ceiling** ~~Assemblies~~ **Panels ,** ~~Plastic~~ **Interior Finish Materials** ~~, Plastic Exterior Building Panels, Wall/Ceiling Coating Systems, Interior or Exterior Finish Systems, 2007~~ **Or Coatings And Exterior Wall Systems** , **2010** .

2.3.20 FRSA/RTI Publications.

Florida Roofing, Sheet Metal and Air Conditioning Contractors Association, 4111 Metric Drive, Suite 6, Winter Park, FL 32792.

07320/1, *Concrete and Clay Roof Tile Installation Manual,* fourth edition, 2001.

2.3.21 GA Publications.

Gypsum Association, ~~810 First Street, NE, #510, Washington, DC 20002~~ **6525 Belcrest Road, Suite 480, Hyattsville, MD 20782** .

GA - 216, *Application and Finishing of Gypsum Panel Products,* ~~2004~~ **2013** .

GA - 600, Fire Resistance Design Manual **Sound Control** , ~~2006~~ **2012** .

2.3.22 HPVA Publications.

Hardwood Plywood and Veneer Association, ~~P.O. Box 2789~~ **1825 Michael Faraday Drive , Reston, VA** ~~20195~~ **20190** .

ANSI/HPVA HP-1, *American National Standard for Hardwood and Decorative Plywood,* 2004**, Reapproved 2010** .

2.3.23 IAPMO Publications.

International Association of Plumbing and Mechanical Officials, ~~20001 Walnut Drive South, Walnut~~ **4755 E. Philadelphia Street, Ontario , CA** ~~91789~~ **91761** .

UMC, *Uniform Mechanical Code,* 2012.

UPC, *Uniform Plumbing Code,* 2012.

2.3.24 ICC Publications.

International Code Council, 500 New Jersey Avenue, NW, 6th Floor, Washington, DC 20001-2070.

ICC/ANSI A117.1, ~~*American National Standard for*~~ *Accessible and Usable Buildings and Facilities*, 2009.

ICC 600, *Standard for Residential Construction in High Wind Regions*, 2013

IRC, *International Residential Code*, 2015.

2.3.25 IME Publications.

Institute of Makers of Explosives, 1120 19th Street, NW, Suite 310, Washington, DC 20036–3605.

~~Safety Library Publication No.~~ **IME SLP 2** , “The American Table of Distances,” June 1991.

2.3.26 NAAMM Publications.

National Association of Architectural Metal Manufacturers, ~~8 South Michigan Avenue~~ **800 Roosevelt Rd. Bldg. C , Suite** ~~1000~~ **312 ,** ~~Chicago~~ **Glen Ellyn , IL** ~~60603~~ **60137** .

ANSI/NAAMM FP 1001, *Guide Specifications for Design of Metal Flagpoles Manual,* 2007.

2.3.27 NCMA Publications.

National Concrete Masonry Association, 13750 Sunrise Valley Drive, Herndon, VA 20171.

Design Manual for Segmental Retaining Walls, ~~2000~~ **3rd edition, 2010** .

2.3.28 PCA Publications.

Portland Cement Association, 5420 Old Orchard Road, Skokie, IL 60077-1083.

PCA 100, *Prescriptive Design of Exterior Concrete Walls for One- and Two-Family Dwellings*, ~~2007~~ **2012** .

2.3.29 PTI Publications.

Post-Tensioning Institute, ~~8601 North Black Canyon Highway, Suite 103, Phoenix, AZ 85021.~~ **38800 Country Club Dr., Farmington Hills, MI 48331** .

PTI DC10.1, Design and Construction of Post-Tensioned Slabs-on-Ground , 3rd edition, 2004**, Errata, 2010** .

2.3.30 RMI Publications.

Rack Manufacturers Institute, 8720 Red Oak Boulevard, Suite 201, Charlotte, NC 28217.

RMI/ANSI MH16.1, *Specification for the Design, Testing and Utilization of Industrial Steel Storage Racks*, 2012.

2.3.31 SDI Publications.

Steel Deck Institute, PO Box ~~25~~ **426** , ~~Fox River Grove, IL 60021~~ **Glenshaw, PA 15116** .

ANSI/SDI-C, *Standard for Composite Steel Floor Deck – Slabs*, ~~2010~~ **2011** .

ANSI/SDI-NC, *Standard for Non-Composite Steel Floor Deck*, 2010.

ANSI/SDI-RD, *Standard for Steel Roof Deck*, 2011.

2.3.32 SJI Publications.

Steel Joist Institute, ~~1173B London Links Drive, Forest, VA 24551~~ **234 W. Cheves Street, Florence, SC 29501** .

SJI CJ, *Standard Specifications for Composite Steel Joist, CJ-Series*, 2010.

SJI JG, *Standard Specifications for Joist Girders*, 2010.

SJI K, *Standard Specifications for Open Web Steel Joists, K-Series*, 2010.

SJI LH/DLH, *Standard Specification for Longspan Steel Joists, LH-Series and Deep Longspan Steel Joists, DLH-Series*, 2010.

2.3.33 SMACNA Publications.

Sheet Metal and Air Conditioning Contractors' National Association, 4201 Lafayette Center Drive, Chantilly, VA 20151-1219.

HVAC Duct Construction Standards — Metal and Flexible, 2005.

2.3.34 **SFPA/** SPC Publications.

Southern Forest Products Association, 6660 Riverside Drive, Suite 212, Metaire, LA 70003/ Southern Pine Council, ~~P.O. Box 641700~~ **2900 Indiana Avenue** , Kenner, LA ~~70064-1700~~ **70065** .

Permanent Wood Foundations: Design & Construction Guide, ~~2000~~ **2013** .

2.3.35 SPRI Publications.

SPRI, ~~77 Rumford Avenue~~ **465 Waverly Oaks Road , Suite** ~~3B~~ **421** , Waltham, MA ~~02453~~ **02452** .

ANSI/SPRI ~~ES~~ **/FM 4435** ES -1, *Wind Design Guide for Edge Systems Used with Low Slope Roofing Systems,* ~~2003~~ **2011** .

ANSI/SPRI RP-4, *Wind Design Standard for Ballasted Single-Ply Roofing Systems,* ~~2002~~ **2013** .

2.3.36 TIA Publications.

Telecommunications Industry Association, 2500 Wilson Boulevard, Suite 300, Arlington, VA 22201.

~~ANSI/~~ **TIA** ~~/EIA~~ **-222-** ~~F~~ **G** , *Structural Standards for Steel Antenna Towers and Antenna Structures,* ~~1996 (R2003).~~ **2005, Addendum 4, 2014. (Supersedes ANSI/TIA/EIA 222-F)**

2.3.37 TPI Publications.

Truss Plate Institute, Inc., ~~583 D'Onofrio Drive~~ **218 North Lee St. , Suite** ~~200~~ **312 ,** ~~Madison~~ **Alexandria ,** ~~WI 53719~~ **VA 22314** .

ANSI/TPI 1, *National Design Standard for Metal Plate Connected Wood Truss Construction,* ~~2002~~ **2007, Errata, 2011** .

2.3.38 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

~~ANSI/~~ UL 9, *Standard for Fire Tests of Window Assemblies,* 2009.

~~ANSI/~~ UL 10B, *Standard for Fire Tests of Door Assemblies*, 2008, Revised 2009.

~~ANSI/~~ UL 10C, *Standard for Positive Pressure Fire Tests of Door Assemblies*, 2009.

~~ANSI/~~ UL 217, *Standard for Single and Multiple Station Smoke Alarms*, 2006, Revised 2012.

~~ANSI/~~ UL 263, *Standard for Fire Tests of Building Construction and Materials,* ~~2003~~ **2011** , Revised ~~2011~~ **2014** .

~~ANSI/~~ UL 294, *Standard for Access Control System Units,* ~~1999~~ **2013** , Revised ~~2010~~ **2015** .

~~ANSI/~~ UL 305, *Standard for Safety Panic Hardware,* 2012**, Revised 2014** .

~~ANSI/~~ UL 555, *Standard for Fire Dampers,* 2006, Revised **2012** .~~ANSI/~~

UL 555C, *Standard for Ceiling Dampers,* ~~2006, Revised 2010~~ **2014** .

~~ANSI/~~ UL 555S, *Standard for Smoke Dampers,* ~~1999, Revised 2012~~ **2014** .

~~ANSI/~~ UL 580, *Standard for Tests for Uplift Resistance of Roof Assemblies,* 2006, Revised ~~2009~~ **2013** .

~~ANSI/~~ UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*, 2008, Revised ~~2010~~ **2013** .

~~ANSI/~~ UL 790, *Standard for Standard Test Methods for Fire Tests of Roof Coverings,* 2004, Revised ~~2008~~ **2014** .

~~ANSI/~~ UL 924, *Standard for Emergency Lighting and Power Equipment,* 2006, Revised ~~2011~~ **2014** .

~~ANSI/~~ UL 1040, *Standard for Fire Test of Insulated Wall Construction,*~~2009~~ **1996 , Revised** ~~2013~~ **2012** .

~~ANSI/~~ UL 1256, *Standard for Fire Test of Roof Deck Constructions,* ~~2007~~ **2002, Revised 2013** .

~~ANSI/~~ UL 1286, *Standard for Office Furnishings,* 2008, Revised ~~2011~~ **2014** .

~~ANSI/~~ UL 1715, *Standard for Fire Test of Interior Finish Material,* 1997, Revised 2013.

~~ANSI/~~ UL 1897, *Standard for Uplift Tests for Roof Covering Systems,* 2012.

UL 1975, *Standard for Fire Tests for Foamed Plastics Used for Decorative Purposes,* 2006.

~~ANSI/~~ UL 1994, *Standard for Luminous Egress Path Marking Systems,* 2004, Revised 2010.

UL 2218, *Standard for Impact Resistance of Prepared Roof Covering Materials,* 2010**, Revised 2012** .

~~ANSI/~~ UL 2390, *Standard for Tests for Wind Resistant Asphalt Shingles with Sealed Tabs*, 2003, Revised 2009.

CAN/ULC S102.2, *Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies,* 2010.

2.3.39 U.S. Government Publications.

U.S. ~~Government Printing~~ Government **Publishing** Office, Washington, DC 20402.

Federal Specification UUB-790a, *Specification for Building Paper, Vegetable Fiber: Kraft, Waterproofed, Water Repellent, and Fiber Resistant,* 1992.

FEMA 356, *Prestandard and Commentary for the Seismic Rehabilitation of Buildings*, 2000. **(Superseded by ASCE 41)**

Title 18, United States Code, Chapter 40, "Importation, Manufacture, Distribution and Storage of Explosive Materials."

Title 28, Code of Federal Regulations, Part 35 and Part 36, Americans with Disabilities Act Accessibility Guidelines (ADAAG).

Title 36, Code of Federal Regulations, Part 1192.

U.S. Department of Justice, *2010 ADA Standards*, September 15, 2010.

~~USDOC PS 1, *U.S. Product Standard for Construction and Industrial Plywood* , 1995.~~

~~USDOC~~ USDOC **Voluntary Product Standard** PS 1, **Structural Plywood** , **2009** .

USDOC **Voluntary Product Standard** PS 2, *Performance Standard for Wood-based Structural-Use Panels,* ~~1992~~ **2004** .

USDOC ~~PS~~ **Voluntary Product Standard** PS 20, *American Softwood Lumber Standard,* ~~1999~~ **2010** .

CPSC, 16 CFR 1201, *Safety Standard for Architectural Glazing Materials,* 1977.

CPSC, 16 CFR 1209, *Interim Safety Standard for Cellulose Insulation,* 1979.

CPSC, 16 CFR 1404, *Cellulose Insulation,* 1979.

2.3.40 WRI/CRSI Publications.

Wire Reinforcement Institute, ~~301 East Sandusky~~ **942 E. Main Street,** ~~Findlay, OH 45839-0450~~ **Hartford, CT 06103** .

TF 700-R, *Design of Slab-on-Ground Foundations*, ~~1996~~ **2007** .

2.3.41 Other Publications.

Templer, J.A., *The Staircase: Studies of Hazards, Falls, and Safer Design*, Cambridge, MA: MIT Press, 1992.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

Statement of Problem and Substantiation for Public Input

Referenced current SDO names, addresses, standard names, numbers, and editions.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 3-NFPA 5000-2015 [Chapter H]	
Public Input No. 4-NFPA 5000-2015 [Global Input]	

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Public Input No. 191-NFPA 5000-2015 [Section No. 2.3.3]

2.3.3 AISC Publications.

American Institute of Steel Construction, One East Wacker Drive, Suite 3100, Chicago, IL 60601-2001.

ANSI/AISC 341, *Seismic Provisions for Structural Steel Buildings*, ~~2010~~ 2016 .

ANSI/AISC 360, *Specification for Structural Steel Buildings*, ~~2010~~ 2016 .

Statement of Problem and Substantiation for Public Input

This proposal updates the editions of both AISC 341 and AISC 360. Both documents are currently under development and will be technically complete by the end of 2015.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 196-NFPA 5000-2015 [Section No. 44.2]	

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Public Input No. 180-NFPA 5000-2015 [Section No. 2.3.4]

2.3.4 AISI Publications.

American Iron and Steel Institute, 25 Massachusetts Avenue N.W., Suite 800, Washington, DC 20001-1431.

AISI-S100, *North American Specification for the Design of Cold-Formed Steel Structural Members*, ~~2012~~ 2016 .

AISI- ~~S110, *Standard for Seismic Design of Cold-Formed Steel Structural Systems—Special Bolted Moment Frames* , 2007, including Supplement 1, dated 2009, (Reaffirmed 2012).AISI-S200,~~ S220, *North American Standard for Cold-Formed Steel Framing —* ~~General Provisions~~ *Nonstructural Members* , ~~2012~~ 2015 .

AISI-~~S210~~ S230 , ~~*North American*~~ *Standard for Cold-Formed Steel Framing —* ~~*Floor and Roof System Design* , 2007, (Reaffirmed 2012)..~~

~~AISI-S211, *North American Standard for Cold-Formed Steel Framing — Wall Stud Design* , 2007, including Supplement 1, dated 2012, (Reaffirmed 2012).~~

~~AISI-S212, *North American Standard for Cold-Formed Steel Framing — Header Design* , 2007, (Reaffirmed 2012)~~ *Prescriptive Method for One- and Two-Family Dwellings* , 2015 .

AISI-~~S213~~ S240 , *North American Standard for Cold-Formed Steel Structural Framing* ~~— Lateral Design, 2007, including Supplement 1, dated 2009, (Reaffirmed 2012)~~ , 2015 .

AISI-~~S214~~ S400 , *North American Standard for* ~~Cold-Formed Steel Framing — Truss Design, 2012.AISI-S220, North American Standard for~~ *Seismic Design of Cold-Formed Steel* ~~Framing — Nonstructural Members, 2011.AISI-S230, *Standard for Cold-Formed Steel Framing — Prescriptive Method for One- and Two-Family Dwellings* , 2007, including Supplement 3, dated 2012, (Reaffirmed 2012).~~ *Structural Systems* , 2015.

Statement of Problem and Substantiation for Public Input

This proposal updates several of the AISI standards currently adopted in NFPA 5000, including AISI S100, AISI S220 and AISI S230. Additionally, references to two new standards are added -- AISI S240 and AISI S400.

With a publication date of 2016, updates to AISI S100 are still being processed.

The newly revised edition of AISI S220 adds performance and testing requirements for screw penetration, update referenced documents, and reference the new AISI S915, Test Standard for Through-the-Web Punchout Cold-Formed Steel Wall Stud Bridging Connectors, and AISI S916, Test Standard for Cold-Formed Steel Framing - Nonstructural Interior Partitions with Gypsum Board.

The newly revised AISI S230 is now in full compliance with the 2015 edition of the International Residential Code, ASCE 7-10 including applicable supplements, and the latest referenced documents. Provisions were added for larger openings in floors, ceilings and roofs. Additionally, the tables were streamlined to reduce complexity and volume of the provisions.

New for the 2018 NFPA 5000, the AISI Committee on Framing Standards has developed AISI S240,

North American Standard for Cold-Formed Steel Structural Framing, to address requirements for construction with cold-formed steel structural framing that are common to prescriptive and engineered design. This standard is intended for adoption and use in the United States, Canada and Mexico and integrates the following AISI standards into one document:
* AISI S200-12, North American Standard for Cold-Formed Steel Framing-General Provisions
* AISI S210-07 (2012), North American Standard for Cold-Formed Steel Framing–Floor and Roof System Design (Reaffirmed 2012)
* AISI S211-07(2012), North American Standard for Cold-Formed Steel Framing–Wall Stud Design (Reaffirmed 2012)
* AISI S212-07(2012), North American Standard for Cold-Formed Steel Framing–Header Design (Reaffirmed 2012)
* AISI S213-07w/S1-09(2012), North American Standard for Cold-Formed Steel Framing– Lateral Design with Supplement 1 (Reaffirmed 2012)
* AISI S214-12, North American Standard for Cold-Formed Steel Framing–Truss Design

Consequently, AISI S240 will supersede all previous editions of the above mentioned individual AISI standards.

In 2015, AISI S400, North American Standard for Seismic Design of Cold-Formed Steel Structural Systems, was developed. This Standard is intended to address the design and construction of cold-formed steel structural members and connections used in the seismic force-resisting systems in buildings and other structures. In this first edition, the material represents a merging of AISI S110, Standard for Seismic Design of Cold- Formed Steel Structural Systems – Special Bolted Moment Frame, 2007 with Supplement No. 1-09, and the seismic portions of AISI S213, North American Standard for Cold-Formed Steel Framing – Lateral Design, 2007 with Supplement No. 1-09. In addition, many of the seismic design requirements stipulated in this Standard are drawn from ANSI/AISC 341-10, Seismic Provisions for Structural Steel Buildings, developed by the American Institute of Steel Construction (AISC). The application of this Standard should be in conjunction with AISI S100, North American Specification for the Design of Cold-Formed Steel Structural Members, and AISI S240, North American Standard for Cold-Formed Steel Framing.

Public review on AISI S230, AISI S240 and AISI S400 finishes on July 6, 2015, while the public review on AISI S220 finishes on July 13, 2015; these documents are expected to be published by the end of 2015, with publication of AISI S100 to follow in 2016.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 181-NFPA 5000-2015 [Section No. 40.3.10]	Update to AISI standards.
Public Input No. 182-NFPA 5000-2015 [Section No. 44.7.3]	Update to AISI standards.
Public Input No. 186-NFPA 5000-2015 [Section No. 44.8]	Update to AISI standards.
Public Input No. 181-NFPA 5000-2015 [Section No. 40.3.10]	
Public Input No. 182-NFPA 5000-2015 [Section No. 44.7.3]	
Public Input No. 189-NFPA 5000-2015 [Section No. 47.2.1.4.4]	

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Public Input No. 188-NFPA 5000-2015 [Section No. 2.3.5]

2.3.5 AITC Publications.

American Institute of Timber Construction, 7012 S. Revere Parkway, Suite 140, Centennial, CO 80112.

ANSI/AITC A190.1, *American National Standard, Structural Glued Laminated Timber,* 2002.

Add new reference standard in Chapter 2:

Rehabilitation Engineering and Assistive Technology Society of North America (RESNA), 1700 North Moore Street, Suite 1540, Arlington, VA 22209

ANSI/RESNA ED-1 Evacuation Devices Volume 1: Emergency Stair Travel Devices for Individuals with Disabilities - 2013

Statement of Problem and Substantiation for Public Input

Emergency stair travel devices are now covered by a performance standard (ANSI/RESNA ED-1:2013), and the availability of these devices will greatly increase safety of individuals with disabilities during evacuations.

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Public Input No. 209-NFPA 5000-2015 [Section No. 2.3.7]

2.3.7 ASCE Publications.

American Society of Civil Engineers, 1801 Alexander Bell Drive, Reston, VA 20191-4400.

ASCE/SEI 7, *Minimum Design Loads for Buildings and Other Structures*, ~~2010~~ 2016 , including Supplement ~~2~~ 1 , ~~2012~~ 2017 .

ASCE/SEI 8, *Standard Specification for the Design of Cold-Formed Stainless Steel Structural Members*, ~~2003~~ 201X .

ASCE/SEI ~~17, *Air Supported Structures* , 1996.ASCE/SEI~~ 19, *Structural Applications of Steel Cables for Buildings*, ~~2010~~ 2016 .

ASCE/SEI 24, *Flood Resistant Design and Construction,* ~~2005~~ 2014 .

ASCE/SFPE 29, *Standard Calculation Methods for Structural Fire Protection*, ~~2005~~ 2016 .

ASCE/SEI ~~31~~ 41 , *Seismic* ~~Evaluation~~ *Rehabilitation of Existing Buildings* , ~~2003.~~ 2017

ASCE/SEI 55, *Tension Membrane Structures,* 2016

Statement of Problem and Substantiation for Public Input

This proposal is intended to function as a placeholder for the update of ASCE standards. The newest version of ASCE 24 (2014) is now available and references to the new edition should be checked throughout NFPA 5000. Updates to ASCE 7, 8 (possibly), 19, 29, 41 and 55 are anticipated within the next two years. Please note that the adoption of ASCE 7 will require additional modifications to several chapters in NFPA 5000, including Chapter 3 (Definitions), Chapter 5 (Performance Based Design), Chapter 35 (Structural Design), etc. Also note that ASCE 17 is being merged into the new ASCE 55, Tension Membrane Structures, and ASCE 31 was merged into the 2013 edition of ASCE 41. There is a 2017 edition of ASCE 41 expected and, as such, that has been recommended for adoption.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 210-NFPA 5000-2015 [Sections 15.1.2.2, 15.1.2.3]	

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Public Input No. 28-NFPA 5000-2015 [Section No. 2.3.7]

2.3.7 ASCE Publications.

American Society of Civil Engineers, 1801 Alexander Bell Drive, Reston, VA 20191-4400.

ASCE/SEI 7, *Minimum Design Loads for Buildings and Other Structures*, 2010, including Supplement 2, 2012.

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ASCE/SEI 31, *Seismic Evaluation of Existing Buildings*, 2003.

Statement of Problem and Substantiation for Public Input

The ASCE/SEI standard Flood Resistant Design and Construction was revised in 2014. This proposed change updates the date. Companion proposals update section where NFPA 5000 specifically references sections in ASCE 24.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 50-NFPA 5000-2015 [Section No. 39.8.2]	
Public Input No. 51-NFPA 5000-2015 [Section No. 39.11.1.1]	
Public Input No. 52-NFPA 5000-2015 [Section No. 39.12.3.1.1]	

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Public Input No. 225-NFPA 5000-2015 [Section No. 2.3.11]

2.3.11 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959. www.astm.org

ASTM A6/A6M, *Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling*, 2011.

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ASTM D 86, *Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure,* 2010.

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ASTM D 2487, *Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System),* 2010.

ASTM D 2626, *Standard Specification for Asphalt-Saturated and Coated Organic Felt Base Sheet Used in Roofing*, 2004.

ASTM D 2823, *Standard Specification for Asphalt Roof Coatings*, 2005.

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ASTM D 2859, *Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials*, 2011.

ASTM D 2898, *Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing*, 2010.

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ASTM D 4586, *Standard Specification for Asphalt Roof Cement, Asbestos-Free*, 2007.

ASTM D 4601, *Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing*, 2004.

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Statement of Problem and Substantiation for Public Input

Added reference standard.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 222-NFPA 5000-2015 [New Section after 48.9]	Proposed text which includes references to a standard currently not referenced in NFPA 5000.

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2.3.11 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959. www.astm.org

ASTM A6/A6M, *Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling*, 2011.

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ASTM ~~C 728~~ C728 , *Standard Specification for Perlite Thermal Insulation Board*, 2005 (2010).

ASTM ~~C 836~~ C836 /~~C 836M~~ C836M , *Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course*, 2010.

ASTM ~~C 840~~ C840 , *Standard Specification for Application and Finishing of Gypsum Board*, 2008.

ASTM ~~C 841~~ C841 , *Standard Specification for Installation of Interior Lathing and Furring,* 2003 (2008)e1.

ASTM ~~C 842~~ C842 , *Standard Specification for Application of Interior Gypsum Plaster*, 2005.

ASTM ~~C 843~~ C843 , *Standard Specification for Application of Gypsum Veneer Plaster*, 1999 (2006).

ASTM ~~C 844~~ C844 , *Standard Specification for Application of Gypsum Base to Receive Gypsum Veneer Plaster*, 2004.

ASTM ~~C 847~~ C847 , *Standard Specification for Metal Lath,* 2010.

ASTM ~~C 887~~ C887 , *Standard Specification for Packaged, Dry, Combined Materials for Surface Bonding Mortar*, 2005 (2010).

ASTM ~~C 897~~ C897 , *Standard Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters*, 2005 (2009).

ASTM ~~C 920~~ C920 , *Standard Specification for Elastomeric Joint Sealants*, 2010.

ASTM ~~C 926~~ C926 , *Standard Specification for Application of Portland Cement-Based Plaster*, 2006.

ASTM ~~C 932~~ C932 , *Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering,* 2006.

ASTM ~~C 933~~ C933 , *Standard Specification for Welded Wire Lath,* 2009.

ASTM ~~C 946~~ C946 , *Standard Practice for Construction of Dry-Stacked, Surface-Bonded Walls,* 2010.

ASTM ~~C 954~~ C954 , *Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness*, 2010.

ASTM ~~C 955~~ C955 , *Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases*, 2009a.

ASTM ~~C 956~~ C956 , *Standard Specification for Installation of Cast-in-Place Reinforced Gypsum Concrete*, 2004.

ASTM ~~C 957~~ C957 , *Standard Specification for High-Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane with Integral Wearing Surface*, 2010.

ASTM ~~C 1002~~ C1002 , *Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs*, 2007.

ASTM ~~C 1029~~ C1029 , *Standard Specification for Spray-Applied Rigid Cellular Polyurethane Thermal Insulation*, 2010.

ASTM ~~C 1032~~ C1032 , *Standard Specification for Woven Wire Plaster Base*, 2006.

ASTM ~~C 1047~~ C1047 , *Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base*, 2010.

ASTM ~~C 1063~~ C1063 , *Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster*, 2008.

ASTM ~~C 1167~~ C1167 , *Standard Specification for Clay Roof Tiles*, 2003 (2009).

ASTM ~~C 1177~~ C1177 /~~C 1177M~~ C1177M , *Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing*, 2008.

ASTM ~~C 1178~~ C1178 /~~C 1178M~~ C1178M , *Standard Specification for Glass Mat Water-Resistant Gypsum Backing Panel*, 2008.

ASTM ~~C 1278~~ C1278 /~~C 1278M~~ C1278M , *Standard Specification for Fiber-Reinforced Gypsum Panel*, 2007a.

ASTM ~~C 1280~~ C1280 , *Standard Specification for Application of Gypsum Sheathing*, 2009.

ASTM ~~C 1289~~ C1289 , *Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board*, 2010.

ASTM ~~C 1328~~ C1328 , *Standard Specification for Plastic (Stucco) Cement*, 2005.

ASTM ~~C 1396~~ C1396 /~~C 1396M~~ C1396M , *Standard Specification for Gypsum Board*, ~~2011~~ 2014a .

ASTM ~~C 1491~~ C1491 , *Standard Specification for Concrete Roof Pavers*, 2003 (2009).

ASTM ~~C 1492~~ C1492 , *Standard Specification for Concrete Roof Tile,* 2003 (2009).

ASTM ~~C 1629~~ C1629 /~~C 1629~~ C1629 M, *Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels*, 2006 (2011).

ASTM ~~D 25~~ D25 , *Standard Specification for Round Timber Piles,* 1999 (2005).

ASTM ~~D 41~~ D41 , *Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing*, 2005.

ASTM ~~D 43~~ D43 , *Standard Specification for Coal Tar Primer Used in Roofing, Dampproofing, and Waterproofing,* 2000 (2006).

ASTM ~~D 86~~ D86 , *Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure,* 2010.

ASTM ~~D 225~~ D225 , *Standard Specification for Asphalt Shingles (Organic Felt) Surfaced with Mineral Granules*, 2007.

ASTM ~~D 226~~ D226 /~~D 226~~ D226 M, *Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing*, 2009.

ASTM ~~D 227~~ D227 , *Standard Specification for Coal-Tar-Saturated Organic Felt Used in Roofing and Waterproofing*, 2003.

ASTM ~~D 312~~ D312 , *Standard Specification for Asphalt Used in Roofing*, 2000 (2006).

ASTM ~~D 450~~ D450 , *Standard Specification for Coal-Tar Pitch Used in Roofing, Dampproofing, and Waterproofing*, 2007.

ASTM ~~D 635~~ D635 , *Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position*, ~~2010~~ 2014 .

ASTM ~~D 1079~~ D1079 , *Standard Terminology Relating to Roofing, Waterproofing, and Bituminous Materials*, 2009.

ASTM ~~D 1143~~ D1143 /~~D 1143M~~ D1143M , *Standard Test Methods for Deep Foundations Under Static Axial Compressive Load,* 2007e1.

ASTM ~~D 1227~~ D1227 , *Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing*, 1995 (2007).

ASTM ~~D 1761~~ D1761 , *Standard Test Methods for Mechanical Fasteners in Wood,* 2006.

ASTM ~~D 1863~~ D1863 , *Standard Specification for Mineral Aggregate Used on Built-Up Roofs*, 2005.

ASTM ~~D 1929~~ D1929 , *Standard Test Method for Determining Ignition Temperature of Plastics*, ~~2012~~ 2014 .

ASTM ~~D 1970~~ D1970 , *Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection*, 2009.

ASTM ~~D 2178~~ D2178 , *Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing*, 2004.

ASTM ~~D 2487~~ D2487 , *Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System),* 2010.

ASTM ~~D 2626~~ D2626 , *Standard Specification for Asphalt-Saturated and Coated Organic Felt Base Sheet Used in Roofing*, 2004.

ASTM ~~D 2823~~ D2823 , *Standard Specification for Asphalt Roof Coatings*, 2005.

ASTM ~~D 2843~~ D2843 , *Standard Test Method for Density of Smoke from the Burning or*

Decomposition of Plastics, 2010.

ASTM ~~D 2859~~ D2859 , *Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials*, 2006 (2011) .

ASTM ~~D 2898~~ D2898 , *Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing*, 2010.

ASTM ~~D 3019~~ D3019 , *Standard Specification for Lap Cement Used with Asphalt Roll Roofing, Non Fibered, Asbestos Fibered, and Non Asbestos Fibered*, 2008.

ASTM ~~D 3161~~ D3161 , *Standard Test Method for Wind-Resistance of Asphalt Shingles (Fan-Induced Method)*, 2009.

ASTM ~~D 3201~~ D3201 , *Standard Test Method for Hygroscopic Properties of Fire-Retardant Wood and Wood-Base Products*, 2008ae1.

ASTM ~~D 3462~~ D3462 /~~D 3462~~ D3462 M, *Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules*, 2010a.

ASTM ~~D 3468~~ D3468 , *Standard Specification for Liquid-Applied Neoprene and Chlorosulfonated Polyethylene Used in Roofing and Waterproofing*, 1999 (2006)e1.

ASTM ~~D 3737~~ D3737 , *Standard Practice for Establishing Allowable Properties for Structural Glued Laminated Timber (Glulam)*, 2009.

ASTM ~~D 3746~~ D3746 , *Standard Test Method for Impact Resistance of Bituminous Roofing Systems*, 1985 (2008).

ASTM ~~D 3747~~ D3747 , *Standard Specification for Emulsified Asphalt Adhesive for Adhering Roof Insulation*, 1979 (2007).

ASTM ~~D 3909~~ D3909 , *Standard Specification for Asphalt Roll Roofing (Glass Felt) Surfaced with Mineral Granules*, 1997b (2004)e1.

ASTM ~~D 4022~~ D4022 , *Standard Specification for Coal Tar Roof Cement, Asbestos Containing*, 2007.

ASTM ~~D 4318~~ D4318 , *Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils*, 2010.

ASTM ~~D 4434~~ D4434 /~~D 4434M~~ D4434M , *Standard Specification for Poly (Vinyl Chloride) Sheet Roofing*, 2011.

ASTM ~~D 4479~~ D4479 , *Standard Specification for Asphalt Roof Coatings — Asbestos-Free*, 2007.

ASTM ~~D 4586~~ D4586 , *Standard Specification for Asphalt Roof Cement, Asbestos-Free*, 2007.

ASTM ~~D 4601~~ D4601 , *Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing*, 2004.

ASTM ~~D 4637~~ D4637 /~~D 4637~~ D4637 M, *Standard Specification for EPDM Sheet Used in a Single-Ply Roof Membrane*, 2010.

ASTM ~~D 4869~~ D4869 , *Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing,* 2005e1.

ASTM ~~D 4897~~ D4897 , *Standard Specification for Asphalt-Coated Glass-Fiber Venting Base Sheet Used in Roofing*, 2001 (2009).

ASTM ~~D 4990~~ D4990 , *Standard Specification for Coal Tar Glass Felt Used in Roofing and Waterproofing*, 1997a (2005)e1.

ASTM ~~D 5019~~ D5019 , *Standard Specification for Reinforced Non-Vulcanized Polymeric Sheet Used in Roofing Membrane,* 2007a.

ASTM ~~D 5055~~ D5055 , *Standard Specification for Establishing and Monitoring Structural*

Capacities of Prefabricated Wood I-Joists, 2010.

ASTM ~~D 5456~~ D5456 , *Standard Specification for Evaluation of Structural Composite Lumber Products*, 2010.

ASTM ~~D 5516~~ D5516 , *Standard Test Method for Evaluating the Flexural Properties of Fire-Retardant Treated Softwood Plywood Exposed to Elevated Temperatures*, 2009.

ASTM ~~D 5643~~ D5643 , *Standard Specification for Coal Tar Roof Cement, Asbestos Free*, 2006.

ASTM ~~D 5664~~ D5664 , *Standard Test Method for Evaluating the Effects of Fire-Retardant Treatments and Elevated Temperatures on Strength Properties of Fire-Retardant Treated Lumber*, 2010.

ASTM ~~D 5665~~ D5665 , *Standard Specification for Thermoplastic Fabrics Used in Cold-Applied Roofing and Waterproofing*, 1999a (2006).

ASTM ~~D 5726~~ D5726 , *Standard Specification for Thermoplastic Fabrics Used in Hot-Applied Roofing and Waterproofing*, 1998 (2005).

ASTM ~~D 6083~~ D6083 , *Standard Specification for Liquid Applied Acrylic Coating Used in Roofing*, 2005e1.

ASTM ~~D 6162~~ D6162 , *Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements,* 2000a (2008).

ASTM ~~D 6163~~ D6163 , *Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements,* 2000 (2008).

ASTM ~~D 6164~~ D6164 , *Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements,* 2005e1.

ASTM ~~D 6222~~ D6222 , *Standard Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using Polyester Reinforcements,* 2008.

ASTM ~~D 6223~~ D6223 /~~D 6223~~ D6223 M, *Standard Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements,* 2002 (2009)e1.

ASTM ~~D 6298~~ D6298 , *Standard Specification for Fiberglass Reinforced Styrene-Butadiene-Styrene (SBS) Modified Bituminous Sheet with a Factory Applied Metal Surface,* 2005e1.

ASTM ~~D 6305~~ D6305 , *Standard Practice for Calculating Bending Strength Design Adjustment Factors for Fire-Retardant-Treated Plywood Roof Sheathing*, 2008.

ASTM ~~D 6380~~ D6380 , *Standard Specification for Asphalt Roll Roofing (Organic Felt),* 2003 (2009).

ASTM ~~D 6381~~ D6381 , *Standard Test Method for Measurement of Asphalt Shingle Mechanical Uplift Resistance*, 2008.

ASTM ~~D 6694~~ D6694 , *Standard Specification for Liquid-Applied Silicone Coating Used in Spray Polyurethane Foam Roofing,* 2008.

ASTM ~~D 6754~~ D6754 /~~D 6754M~~ D6754M , *Standard Specification for Ketone Ethylene Ester Based Sheet Roofing,* 2010.

ASTM ~~D 6757~~ D6757 , *Standard Specification for Steep-Slope Underlayment Felt Containing Inorganic Fibers,* 2007.

ASTM ~~D 6841~~ D6841 , *Standard Practice for Calculating Design Valve Treatment Adjustment Factors for Fire-Retardant-Treated Lumber,* 2008.

ASTM ~~D 6878~~ D6878 , *Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing,* 2008e1.

ASTM ~~E 84~~ E84 , *Standard Test Method for Surface Burning Characteristics of Building Materials*, ~~2013~~ 2015a .

ASTM ~~E 90~~ E90 , *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements*, 2009.

ASTM ~~E 96~~ E96 /~~E 96M~~ E96M , *Standard Test Methods for Water Vapor Transmission of Materials*, ~~2005~~ 2014 .

ASTM ~~E 108~~ E108 , *Standard Test Methods for Fire Tests of Roof Coverings,* 2011.

ASTM ~~E 119~~ E119 , *Standard Test Methods for Fire Tests of Building Construction and Materials,~~2012a~~* 2014 .

ASTM ~~E 136~~ E136 , *Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C,*2012.

ASTM ~~E 492~~ E492 , *Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine*, 2009.

ASTM ~~E 605~~ E605 , *Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members,* 1993 (2006).

ASTM ~~E 648~~ E648 , *Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source,~~ 2010 e1~~ 2014c .

ASTM ~~E 736~~ E736 , *Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members,* 2000 (2006).

ASTM ~~E 814~~ E814 , *Standard Test Method for Fire Tests of Through-Penetration Fire Stops*, ~~2011a~~ 2013a .

ASTM ~~E 970~~ E970 , *Standard Test Method for Critical Radiant Flux of Exposed Attic Floor Insulation Using a Radiant Heat Energy Source*, ~~2010~~ 2014 .

ASTM ~~E 1300~~ E1300 , *Standard Practice for Determining Load Resistance of Glass in Buildings*, 2009a.

ASTM ~~E 1591~~ E1591 , *Standard Guide for Obtaining Data for Deterministic Fire Models*, ~~2007~~ 2013 .

ASTM ~~E 1592~~ E1592 , *Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference*, 2005.

ASTM ~~E 1602~~ E1602 , *Standard Guide for Construction of Solid Fuel Burning Masonry Heaters*, 2003(2010)e1.

ASTM ~~E 1966~~ E1966 , *Standard Test Method for Fire-Resistive Joint Systems*, 2007 (2011).

ASTM ~~E 2074~~ E2074 , *Standard Test Method for Fire tests of Door Assemblies, Including Positive Pressure Testing of Side-Hinged and Pivoted Swinging Door Assemblies*, 2000 e1 (withdrawn 2007).

ASTM ~~E 2174~~ E2174 , *Standard Practice for On-Site Inspection of Installed Fire Stops*, 2009.

ASTM ~~E 2307~~ E2307 , *Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-story Test Apparatus*, ~~2010~~ 2015a .

ASTM ~~E 2393~~ E2393 , *Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers*, 2010.

ASTM ~~E 2404~~ E2404 , *Standard Practice for Specimen Preparation and Mounting of Textile, Paper or Polymeric (including Vinyl) and Wood Wall or Ceiling Coverings, ~~and of~~ Facings and ~~Wood~~ Veneers ~~Intended to be Applied on Site Over a Wood Substrate to~~ , to Assess Surface Burning Characteristics*, ~~2013~~ 2015a .

ASTM ~~E 2573~~ E2573 , *Standard Practice for Specimen Preparation and Mounting of*

Site-fabricated Stretch Systems to Assess Surface Burning Characteristics, 2012.

ASTM E 2599, *Standard Practice for Specimen Preparation and Mounting of Reflective Insulation , Radiant Barrier,and Vinyl Stretch Ceiling Materials for Building Applications to Assess Surface Burning Characteristics*, ~~2011~~ 2015 .

ASTM ~~E 2652~~ E2652 , *Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750 Degrees C*, 2012.

ASTM ~~E 2768~~ E2768 , *Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials*, ~~year?~~ 2011.

ASTM ~~F 547~~ F547 , *Standard Terminology of Nails for Use with Wood and Wood-Base Materials*, 2006.

ASTM ~~F 851~~ F851 , *Standard Test Method for Self-Rising Seat Mechanisms*, 1987 (2005).

ASTM ~~F 1292~~ F1292 , *Standard Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment*, ~~2009~~ 2013 .

ASTM ~~F 1577~~ F1577 , *Standard Test Methods for Detention Locks for Swinging Doors*, 2005.

ASTM ~~F 1667~~ F1667 , *Standard Specification for Driven Fasteners: Nails, Spikes, and Staples*, 2005.

ASTM ~~F 1951~~ F1951 , *Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment*, ~~2009b~~ 2014 .

Statement of Problem and Substantiation for Public Input

date updates

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Public Input No. 201-NFPA 5000-2015 [Section No. 2.3.31]

2.3.31 SDI Publications.

Steel Deck Institute, ~~PO Box 25, Fox River Grove, IL 60021~~ P. O. Box 426, Glenshaw, PA 15116 .

ANSI/SDI-C, *Standard for Composite Steel Floor Deck – Slabs*, ~~2010~~ 2017 .

ANSI/SDI-NC, *Standard for Non-Composite Steel Floor Deck*, ~~2010~~ 2017 .

ANSI/SDI-QA/QC, *Standard for Quality Control and Quality Assurance for Installation of Steel Deck,* 2017.

ANSI/SDI- RD, *Standard for Steel Roof Deck*, ~~2011~~ 2017 .

Statement of Problem and Substantiation for Public Input

This proposal adopts the new editions of the SDI documents. Additionally, while the reference to SDI-QA/QC was added in Section 40.3.10(3) for the 2015 edition of NFPA 5000, it was not picked up here. (Note that this should be an errata for the 2015 edition.) Finally, there is a new address for SDI.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 202-NFPA 5000-2015 [Section No. 44.7.2]	

Submitter Information Verification

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Public Input No. 31-NFPA 5000-2015 [Section No. 2.3.31]

2.3.31 SDI Publications.

Steel Deck Institute, PO Box ~~25~~ 426 , ~~Fox River Grove, IL 60021.~~ Glenshaw, PA, 15116

ANSI/SDI-C, *Standard for Composite Steel Floor Deck – Slabs*, ~~2010~~ 2017 .

ANSI/SDI-NC, *Standard for Non-Composite Steel Floor Deck*, ~~2010~~ 2017 .

ANSI/SDI-RD, *Standard for Steel Roof Deck*, ~~2011~~ 2017 .

ANSI/SDI-QA/QC, *Standard for Quality Control and Quality Assurance for Installation of Steel Deck* , 2017.

Statement of Problem and Substantiation for Public Input

1. The address of the Steel Deck Institute is updated.
2. The QA/QC Standard is included as a reference standard in the 2015 NFPA 5000, but was not included in the reference document list in Chapter 2. The version for the 2015 Code was the 2011 version of the standard. This is an editorial correction/addition.
3. All 4 standards are updated to the 2017 editions, which will be available prior to the final approval of the 2018 NFPA 5000.

Submitter Information Verification

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Public Input No. 203-NFPA 5000-2015 [Section No. 2.3.32]

2.3.32 SJI Publications.

Steel Joist Institute, ~~1173B London Links Drive, Forest, VA 24551~~ 234 W. Cheves Street, Florence, SC 29501 .

SJI CJ, *Standard Specifications for Composite Steel Joist, CJ-Series*, ~~2010~~ 2015 .

SJI - ~~JG~~ -100 , *Standard* ~~Specifications for Joist Girders, 2010.SJI K, Standard Specifications for Open Web Steel Joists, K~~ *Specification for K -Series* , ~~2010.SJI~~ *LH* ~~/DLH, Standard Specification for Longspan Steel Joists, LH~~ *-Series* - ~~and Deep Longspan Steel Joists~~ , *DLH-Series* ~~, 2010.~~ *Open Web Steel Joists and for Joist Girders* , 2015

Statement of Problem and Substantiation for Public Input

The 2015 edition (44th Edition) of the combined SJI-100, Standard Specification for K-Series, LH-Series and DLH-Series Open Web Steel Joists and for Joist Girders, represents a major change in the presentation of the SJI specifications. Previously there were three separate specifications (all found in the 43rd Edition), covering K-Series, LH/DLH-Series and Joist Girders, each one an ANSI standard. The newly completed combined standard represents a major simplification for the specifying professional.

Additionally, SJI-CJ will be updated by the end of 2015.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 204-NFPA 5000-2015 [Section No. 35.1.2.8.3]	
Public Input No. 205-NFPA 5000-2015 [Section No. 44.4]	

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Public Input No. 175-NFPA 5000-2015 [Section No. 2.3.38]

2.3.38 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

ANSI/UL 9, *Standard for Fire Tests of Window Assemblies,* ~~2009~~ 2015 .

ANSI/UL 10B, *Standard for Fire Tests of Door Assemblies*, 2008, Revised ~~2009~~ 2015 .

ANSI/UL 10C, *Standard for Positive Pressure Fire Tests of Door Assemblies*, ~~2009~~ 2015 .

ANSI/UL 217, *Standard for Single and Multiple Station Smoke Alarms*, 2006, Revised 2012.

ANSI/UL 263, *Standard for Fire Tests of Building Construction and Materials,* 2003, Revised ~~2011~~ 2014 .

ANSI/UL 294, *Standard for Access Control System Units,* 1999, Revised ~~2010~~ 2014 .

ANSI/UL 305, *Standard for Safety Panic Hardware,*~~2012~~ 2014 .

ANSI/UL 555, *Standard for Fire Dampers,* 2006, Revised ~~2012~~ 2014 .

ANSI/UL 555C, *Standard for Ceiling Dampers,* 2006, Revised ~~2010~~ 2014 .

ANSI/UL 555S, *Standard for Smoke Dampers,* 1999, Revised ~~2012~~ 2014 .

ANSI/UL 580, *Standard for Tests for Uplift Resistance of Roof Assemblies,* 2006, Revised ~~2009~~ 2013 .

ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*, 2008, Revised ~~2010~~ 2013 .

ANSI/UL 790, *Standard for Standard Test Methods for Fire Tests of Roof Coverings,* 2004, Revised ~~2008~~ 2014 .

ANSI/UL 924, *Standard for Emergency Lighting and Power Equipment,* 2006, Revised ~~2011~~ 2014 .

ANSI/UL 1040, *Standard for Fire Test of Insulated Wall Construction,*2009, Revised 2013.

ANSI/UL 1256, *Standard for Fire Test of Roof Deck Constructions,* ~~2007~~ 2013 .

ANSI/UL 1286, *Standard for Office Furnishings,* 2008, Revised ~~2011~~ 2014 .

ANSI/UL 1715, *Standard for Fire Test of Interior Finish Material,* 1997, Revised 2013.

ANSI/UL 1897, *Standard for Uplift Tests for Roof Covering Systems,*2012.

UL 1975, *Standard for Fire Tests for Foamed Plastics Used for Decorative Purposes,* 2006.

ANSI/UL 1994, *Standard for Luminous Egress Path Marking Systems,* 2004, Revised ~~2010~~ 2015 .

UL 2218, *Standard for Impact Resistance of Prepared Roof Covering Materials,* 2010.

ANSI/UL 2390, *Standard for Tests for Wind Resistant Asphalt Shingles with Sealed Tabs*, 2003, Revised 2009.

CAN/ULC S102.2, *Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies,* 2010.

Statement of Problem and Substantiation for Public Input

The proposed changes reflect updated editions of UL Standards

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Public Input No. 114-NFPA 5000-2015 [Section No. 4.4.1]

4.4.1 * Multiple Safeguards.

The design of every building or structure intended for human occupancy shall be such that reliance for property protection and safety to life does not depend solely on any single safeguard. An additional safeguard(s) shall be provided for property protection and life safety in case any single safeguard is ineffective due to ~~inappropriate~~ human actions, building failure, or system failure.

Statement of Problem and Substantiation for Public Input

“Inappropriate human actions” is vague and leave lots of room for varied interpretations.

Submitter Information Verification

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Public Input No. 106-NFPA 5000-2015 [New Section after 4.5.8.1]

Hazard Evaluation

4.5.8.1.1 Occupancies containing water-based fire protection systems shall be subject to evaluation to identify changes in the occupancy, hazard, water supply, storage commodity, storage arrangement, building modification, or other condition that affects the installation criteria of the system in accordance with table 4.5.8.1.1.

Occupancy Classification	Frequency
Assembly Educational Day Care Health Care Ambulatory Care Detention & Correctional Residential Residential Board & Care Business	10 years
Mercantile Industrial Storage	5 years

4.5.8.1.1.1 The evaluation required in 4.5.8.1.1 shall be performed by persons acceptable to the AHJ.

4.5.8.1.1.2 Where the evaluation reveals that the installed system is inadequate to protect the building or hazard in question, the property owner or designated representative shall make the required corrections. [***25:*** *4.1.7.2*]

Statement of Problem and Substantiation for Public Input

Changes in occupancy, use or process, or materials used or stored in the building are addressed by NFPA 25 and trigger the owner to have their system evaluated for its capacity to protect the new occupancy. At a minimum, this requires the owner to play an active role in the process by reporting these changes when they occur. Additionally it requires the owner to have specific knowledge of what is occurring in their building at all times, which may not always be the case. Examples of this include warehouse occupancies where spaces are leased and tenants often change. This can result in storage arrangements and/or commodities not contemplated during system design. System design is outside the scope of NFPA 25 and evaluating the system is not part of routine inspection, testing and maintenance required by that standard.

This proposal addresses the issue by ensuring that changes effecting sprinkler performance are identified on a set frequency rather than by chance and that the fire protection systems are capable of protecting the hazard.

Submitter Information Verification

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Public Input No. 211-NFPA 5000-2015 [New Section after 4.5.8.1]

4.5.8.1.1 ***Whenever impairments, critical deficiencies, or non-critical deficiencies are identified in water based fire protection systems maintained under NFPA 25, they shall be corrected in accordance with 4.5.8.1.1.1 through 4.5.8.1.1.3.***

4.5.8.1.1.1* ***Impairments.*** ***Impairments shall be corrected or repaired immediately.***

4.5.8.1.1.2* ***Critical Deficiencies***

4.5.8.1.1.2.1 ***Critical deficiencies shall be corrected or repaired within 30 days.***

4.5.8.1.1.2.2 ***Corrections or repairs shall be permitted to be made after 30 days if an approved corrective action plan is approved by the AHJ.***

4.5.8.1.1.3* ***Non-Critical deficiencies***

4.5.8.1.1.3.1 ***Non-Critical deficiencies shall be corrected or repaired within 90 days.***

4.5.8.1.1.3.2 ***Corrections or repairs shall be permitted to be made after 90 days if an approved corrective action plan is approved by the AHJ.***

Statement of Problem and Substantiation for Public Input

This language sets specific time frames for corrective action to remedy impairments, critical deficiencies, and non-critical deficiencies identified by NFPA 25. This language has also been proposed for NFPA 101 following 101:4.6.12.1.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 212-NFPA 5000-2015 [New Section after A.4.5.6]	

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Public Input No. 115-NFPA 5000-2015 [Section No. 6.2.1.1]

6.2.1.1

Multiple occupancies, as defined in 6.2.2.1, shall comply with ~~the requirements of the following~~ all of the following requirements :

(1) Subsection 6.2.1, and

(2) Subsection 6.2.3, mixed occupancy requirements, or 6.2.4, separated occupancy requirements

Statement of Problem and Substantiation for Public Input

For clarification. This clarifies that all of the items are required.

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Public Input No. 116-NFPA 5000-2015 [Section No. 6.2.1.5]

6.2.1.5

Where ~~minor accessory~~ uses secondary to the predominant occupancy do not occupy more than 25 percent of the area of any floor of a building, nor more than the basic area permitted for the occupancy by 7.4.2 for such ~~minor use~~ secondary uses , ~~for the purpose of determining permitted area, the principal~~ the predominant use of the ~~building~~ floor shall determine the occupancy classification for the purpose of determining allowable area .

Statement of Problem and Substantiation for Public Input

First, this section was difficult to understand due to the sentence structure. Next, the term “minor accessory use” is confusing for several reasons. It is redundant to say “minor accessory.” Also, the term “accessory” has a legacy meaning in model building codes, which implies certain applicability versus another legacy term “incidental.”

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Public Input No. 118-NFPA 5000-2015 [Section No. 6.2.4.1.1]

6.2.4.1.1

Separation of occupancies having high hazard contents shall also be in accordance with 34.3.2.3 and 34.2.5.2 except as otherwise permitted by 6.2.4.7.

Table 6.2.4.1.1(a) Required Fire Resistance–Rated Separations for Separated Occupancies (hr)†, Part 1

Occupancy	Assembly ≤300	Assembly >300 to ≤ 1000	Assembly >1000	Educational	Day Care > 12 Clients	Day-Care Homes	Health Care	Ambulatory Health Care	D Co
Assembly ≤300	2	0	0	0	2	2	2	2	
Assembly >300 to ≤1000	‡	-	-	0	2	2‡	2	2	
Assembly >1000	2	0	-	-	2	2‡	2	2	
Educational	2	2	-	-	2	2	2	2	
Day Care >12 Clients	‡	‡	2	2	-	2‡	2	2	
Day-Care Homes	2	2	2	2	2‡	-	2‡	2	
Health Care	2	2	2	1	2‡	2‡	-	2‡	
Ambulatory Health Care	2	2	2	2	2	2‡	2‡	-	

Detention and Correctional	

2‡	2‡
One- and Two-Family Dwellings	

	1
Lodging or Rooming Houses	
---	

† *Minimum Fire Resistance Rating.* The fire resistance rating is permitted to be reduced by 1 hour, but in no case to less than 1 hour, where the building is protected throughout by an approved automatic sprinkler system in accordance with 55.3.1.1 (1) and electrically supervised in accordance with 55.3.2 .

‡ The 1-hour reduction due to the presence of sprinklers in accordance with the double-dagger footnote is not permitted.

Table 6.2.4.1.1(b) Required Fire Resistance–Rated Separations for Separated Occupancies (hr)†, Part 2

Occupancy	Hotels and Dormitories	Apartment Buildings	Board and Care, Small	Board and Care, Large	Mercantile	Mercantile, Covered Mall	Mercantile, Bulk Retail	Business	Ind H
Assembly ≤300	2	2	2	2	2	2	3	1	
Assembly >300 to ≤1000	2	2	2	2	2	2	3	2	
Assembly >1000	2	2	2	2	2	2	3	2	
Educational	2	2	2	2	2	2	3	2	
Day Care >12 Clients	2	2	2	2	2	2	3	2	
Day-Care Homes	2	2	2	2	2	2	3	2	
Health Care	2‡	2‡	2‡	2‡	2‡	2‡	3	2‡	
Ambulatory Health Care	2	2	2	2	2	2	3	1	
Detention and Correctional	2‡	2‡	2‡	2‡	2‡	2‡	3	3	
One- and Two-Family Dwellings	2	2	1	2	2	2	3	2	

Occupancy	Hotels and Dormitories	Apartment Buildings	Board and Care, Small	Board and Care, Large	Mercantile	Mercantile, Covered Mall	Mercantile, Bulk Retail	Business	Ind H
Lodging or Rooming Houses	2	2	2	2	2	2	3	2	

Hotels and Dormitories
-
2 2 2 2 2 3 2 2 3 2 3

Apartment Buildings
--
2 2 2 2 3 2 2 3 2 3

Board and Care, Small
---
1 2 2 3 2 3 3 2 3

Board and Care, Large
----
2 2 3 2 3 3 2 3

Mercantile
-----
0 3 2 2 2 2 2

Mercantile, Covered Mall
------
3 2 3 3 2 3

Mercantile, Bulk Retail
----
2 3 3 2 2

Business
----
2 2 2 2

Industrial, Low Hazard
----
0 1 2

Industrial
----
1 2

Storage, Low Hazard

1

Storage

~~† *Minimum Fire Resistance Rating.* The fire resistance rating is permitted to be reduced by 1 hour, but in no case to less than 1 hour, where the building is protected throughout by an approved automatic sprinkler system in accordance with 55.3.1.1 (1) and electrically supervised in accordance with 55.3.2 .~~

~~‡ The 1-hour reduction due to the presence of sprinklers in accordance with the double-dagger footnote is not permitted.~~

Statement of Problem and Substantiation for Public Input

This public input revises Table 6.2.4.1.1a by changing the entries for Assembly versus Education on all three from 2 to 0 because assembly uses within educational facilities are most likely non-simultaneous uses. The exiting and fire protection components required in the code provide sufficient safeguards making the fire separation unnecessary.

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Public Input No. 5-NFPA 5000-2015 [New Section after 6.4.2.9]

6.4.2.9. Animal Housing Facilities.

Area of a building or structure, including interior and adjacent exterior spaces, where animals are fed, rested, worked, exercised, treated, exhibited, or used for production shall be constructed in accordance with **NFPA 150** , *Standard on Fire and Life Safety in Animal Housing Facilities* .

Statement of Problem and Substantiation for Public Input

This would require a renumbering in Chapter 6 since this line item is already assigned to Cellulose Nitrate Motion Picture Film Storage.

Currently, NFPA 5000 recognizes only one type of animal housing facility, which is racetrack facilities and points to NFPA 150 for governing requirements. However, NFPA 150 is no longer limited to racetrack stable facilities but encompasses all animal housing facilities. In keeping with that, this PI proposes a new section for Animal Housing Facilities. A corresponding PI proposes the deletion of Racetrack Facilities from Chapter 6 since this new section would incorporate that specific type of facility as well as all other types of animal housing facilities.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 6-NFPA 5000-2015 [Section No. 6.4.2.56]	

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Public Input No. 6-NFPA 5000-2015 [Section No. 6.4.2.56]

6.4.2.56 ~~Racetrack Facilities.~~

~~Buildings and structures provided at racetracks, including those containing stalls for housing horses, human sleeping quarters, feed rooms, tack rooms, equipment storage rooms, blacksmith shops, kitchens, mechanical equipment rooms, and toilet facilities shall be constructed in accordance with NFPA 150, *Standard on Fire and Life Safety in Animal Housing Facilities* .~~

Reserved.

Statement of Problem and Substantiation for Public Input

See PI No. 5 for substantiation.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 5-NFPA 5000-2015 [New Section after 6.4.2.9]	

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Public Input No. 138-NFPA 5000-2015 [Section No. 13.1]

13.1 General. Sections 13.1.1 through 13.8.7 pertain to structures encroaching or built within a public way apply unless regulated by other laws or ordinances.

13.1.1

No part of any structure or any appendage thereto, except signs, shall project beyond the property lines of the building site, except as specified in Section 13.1. Signs and their method of installation shall conform to the requirements of Chapter 32.

13.1.2

Structures or appendages regulated by this *Code* shall be constructed of materials as specified in Chapter 35.

13.1.3

The projection of any structure or appendage shall be the distance measured horizontally from the property line to the outermost point of the projection.

~~13.1.4~~ –

~~No provisions of this chapter shall be construed to permit the violation of other laws or ordinances regulating the use and occupancy of public property.~~

Statement of Problem and Substantiation for Public Input

This adds clarifying language to the beginning of the section, which is a clear statement of intent.

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Public Input No. 210-NFPA 5000-2015 [Sections 15.1.2.2, 15.1.2.3]

Sections 15.1.2.2, 15.1.2.3

15.1.2.2 Equivalent Alternatives.

15.1.2.2.1

Equivalency shall be permitted in accordance with Section 1.5.

15.1.2.2.2*

Where this chapter requires compliance with the seismic design provisions of Chapter 35, the use of ~~FEMA 356, Prestandard and Commentary for the Seismic Rehabilitation of~~ ASCE 41, *Seismic Evaluation and Retrofit of Existing Buildings*, shall be permitted. Where ~~FEMA 356~~ ASCE 41 is used, the seismic performance criteria shall be as indicated in Table ~~15.1.2.2.2~~ -2 of ASCE 41 for the assigned ~~occupancy category.~~

~~Table 15.1.2.2.2 Seismic Performance Criteria~~

~~FEMA 356 Performance Levels Occupancy Category (See Table 35.3.1) BSE-1 Earthquake Hazard Level ‡ BSE-2 Earthquake Hazard Level ‡ I LS CP II LS CP III ‡ IV IO LS~~

~~LS: Life safety.~~

~~CP: Collapse prevention.~~

~~IO: Immediate occupancy.~~

~~‡ BSE-1 and BSE-2 hazards are defined in FEMA 356.~~

~~‡ Values for Occupancy Category III performance levels are to be taken as halfway between the values specified for Occupancy Category II and Occupancy Category IV.~~

risk category.

15.1.2.3 Other Alternatives.

15.1.2.3.1

Where compliance with this chapter, or with any other code as required by this chapter, is technically infeasible or would impose undue hardship because of structural, construction, or dimensional difficulties, the authority having jurisdiction shall be permitted to accept other alternative materials, design features, and operational features.

15.1.2.3.2*

Where permitted in this chapter, seismic design using ASCE ~~/SEI 31~~ 41 , *Seismic Evaluation and Retrofit of Existing Buildings* , ~~or FEMA 356~~ shall be permitted. Where ~~either ASCE/SEI 31 or FEMA 356~~ ASCE 41 is used, the seismic performance criteria shall be as indicated in Table ~~15.1.2.3.2~~ 2-1 of ASCE 41 for the assigned ~~occupancy category.~~

~~Table 15.1.2.3.2 Reduced Seismic Performance Criteria~~

~~FEMA 356 Performance Levels Occupancy Category *(See Table 35.3.1)* ASCE/SEI 31 Performance Levels BSE-1 Earthquake Hazard Level ‡ BSE-2 Earthquake Hazard Level ‡~~

~~I LS LS NR II LS LS NR III ‡ NR IV IO IO NR~~

~~LS: Life safety.~~

~~NR: Not required.~~

~~IO: Immediate occupancy.~~

~~‡ BSE-1 and BSE-2 hazards are as defined in FEMA 356.~~

~~‡ Values for Occupancy Category III performance levels are to be taken as halfway between the values specified for Occupancy Category II and Occupancy Category IV.~~

risk category.

Statement of Problem and Substantiation for Public Input

ASCE 31 and FEMA 356 have been replaced with ASCE 41-13, Seismic Evaluation and Retrofit of Existing Buildings. This proposal cleans up the two sections.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 209-NFPA 5000-2015 [Section No. 2.3.7]	Update to ASCE standards.
Public Input No. 213-NFPA 5000-2015 [Sections A.15.1.2.2.2, A.15.1.2.3.2]	Deletion of Annex note.
Public Input No. 213-NFPA 5000-2015 [Sections A.15.1.2.2.2, A.15.1.2.3.2]	

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Public Input No. 145-NFPA 5000-2015 [New Section after 33.3.2.2]

33.3.2.3 Standpipes

High-rise buildings shall be equipped with a Class I standpipe system installed in accordance with NFPA 14.

Statement of Problem and Substantiation for Public Input

High-rise buildings are a unique hazard requiring specialized equipment. All other requirements for high-rise buildings are found in Chapter 33 except standpipes which clearly warrant this fire protection feature. Presently there is no requirement for standpipe systems under the high rise section of the code. One has to go to Chapter 55 to find the requirement which reads as follows: 55.4.1 New buildings shall be equipped with a Class I standpipe system installed in accordance with NFPA 14, Standard for the Installation of Standpipe and Hose Systems, where any of the following conditions exist:
(1) the building is four or more stories in height, and (2) the building is more than 50 ft (15 m) above grade plane and contains intermediate stories or balconies. While Chapter 55 requires this for buildings 50 ft or more in height, the definition of a high-rise building falls within this requirement, which should be added to Chapter 33.

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Public Input No. 179-NFPA 5000-2015 [Section No. 33.3.3.1]

33.3.3.1

All vertical exit stair enclosures serving the high-rise portion of the building shall be smokeproof enclosures in accordance with 11.2.3.

Statement of Problem and Substantiation for Public Input

The current wording requires all exit stairs in a high-rise building to be a smoke proof enclosure. The revised wording would permit exit stairs only serving the lower non high-rise stories of the building to be constructed a exit stairs and not the more elaborate requirements of a smoke-proof enclosure. The lower stories of many high-rise buildings are typically much larger in footprint than the high-rise portion and often contain shopping malls and assembly occupancies. The current wording requires all stairs, even those serving a two-story mall or the second floor assembly to be smoke proof enclosures even though they do not connect with the high-rise floors.

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Public Input No. 146-NFPA 5000-2015 [Section No. 33.3.7]

33.3.7 Elevators

33.3.7.1. Ambulance Stretcher Accommodation.

33.3.7.1.1 In buildings of more than three stories, a minimum of one elevator shall be provided for fire fighter emergency operation to all floors.

33.3.7.1.2 The elevator car shall be sized and arranged to accommodate a 2 ft × 7 ft (610 mm × 2130 mm) ambulance stretcher with minimum 5-in. (125-mm) radius corners in the horizontal, open position.

33.3.7.1.3 The elevator car shall be identified by the international symbol for emergency medical services (star of life). The symbol shall be minimum 3 in. (75 mm) in height and shall be located inside the car on both sides of the door frame.

33.3.7.2 Fire Service Access Elevator.

In buildings with an occupied floor over 120 ft (36.6 m) in height above the lowest level of fire department vehicle access, a minimum of two fire service access elevators, each having a minimum 3500 lb (1590 kg) capacity and serving every floor within the subject building, shall be provided to serve as fire service access elevators in accordance with Section 54.12.

Statement of Problem and Substantiation for Public Input

There is a requirement (33.3.7) for a Fire Service Access Elevator in a high-rise building greater than 120 feet in height but there is no requirement in the high-rise section for the ambulance stretcher accommodation. One must go to the elevator section at 54.3 to find this requirement which obviously applies to high-rises since it applies to buildings greater than 3 stories in height.

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Public Input No. 36-NFPA 5000-2015 [Section No. 33.3.7]

33.3.7 Fire Service Access Elevator.

In buildings with an occupied floor over 120 ft (36.6 m) in height above the lowest level of fire department vehicle access, a minimum of two fire service access elevators, each having a minimum 3500 lb (1590 kg) capacity and serving every floor within the subject building, shall be provided to serve as fire service access elevators in accordance with Section 54.12.

Exceptions:

(1) One fire service access elevator is permitted where the entire floor consists of a single dwelling unit.

(2) No fire access elevator is required to serve the top floor of the building where the entire floor consists of building support equipment.

Statement of Problem and Substantiation for Public Input

Pent house floors that consists of a single luxury apartment occupying the entire floor should be permitted to have one fire access elevator access. Such units are usually located at the top floors where not all elevator hoistways intended to serve. In addition, the circulation space is limit for apartment servicing which is difficult to be provided with a second fire access elevator. The top floor consisting of building support equipment should be relieved from the fire access elevator requirement since the space is primarily occupied by the building support equipment where the space does not allow for hoistway extension. Fire-fighters can always use the stair to access the mechanical floor if it is only one level.

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Public Input No. 171-NFPA 5000-2015 [New Section after A.1.2]

A.1.3.1

Standards Council Decision #14-1 directed the NFPA Technical Committees to discontinue requirements for the storage and retail sales of consumer fireworks. As such, these facilities are not addressed by NFPA 5000.

Statement of Problem and Substantiation for Public Input

Standards Council Decision #14-1 directed the NFPA Technical Committees to discontinue requirements for the storage and retail sales of consumer fireworks. The Council then directed and subsequently issued a series of TIA's removing any requirements for consumer fireworks from NFPA codes and standards. Unfortunately the TIA's did not accomplish the intent of the Council Decision; but rather, created an unacceptable situation in which consumer fireworks are currently treated as ordinary hazard contents by the various NFPA codes and standards. Instead of not addressing the retail sales of consumer fireworks, NFPA 5000 now treats such facilities as a mercantile occupancy with ordinary hazard contents. In order to accomplish the directive issued by the Council, the storage and retail sales of consumer fireworks needs to be specifically excluded from the scope of NFPA 5000.
While the APA continues to believe that the Council Decision was based on false and misleading information and that the resulting action is contrary to NFPA's mission of "eliminating death, injury, property and economic loss due to fire, electrical and related hazards", the APA submits the Public Input to correct the errors made in implementing the Council Decision.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 170-NFPA 5000-2015 [Section No. 1.3.1]	Annex note addressing proposed new langauge to 1.3.1

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Public Input No. 212-NFPA 5000-2015 [New Section after A.4.5.6]

A. 4.5.8.1.1.1 ***The process of correcting or repairing an impairment should begin as soon as the impairment is discovered. If the necessary parts are on hand the correction or repair can be accomplished in a matter of a few hours. However, in many cases, it may take several days to order repair parts, have them shipped, and schedule manpower to make the repair.***

A.4.5.8.1.1.2 *The process of correcting or repairing a critical deficiency should begin as soon as it is discovered and with a sense of urgency. If the necessary parts are on hand the correction or repair can be accomplished in a matter of a few hours. However, in many cases it may take several days to order repair parts, have them shipped, and schedule manpower to make the repair. There are very few instances when a critical deficiency cannot be corrected or repaired within 30 days.*

A.4.5.8.1.1.3 *Non-critical deficiencies do not have an effect on system performance and therefore correcting or repairing them is allowed to take longer.*

Statement of Problem and Substantiation for Public Input

This language sets specific time frames for corrective action to remedy impairments, critical deficiencies, and non-critical deficiencies identified by NFPA 25.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 211-NFPA 5000-2015 [New Section after 4.5.8.1]	Main PI in body of standard

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Public Input No. 213-NFPA 5000-2015 [Sections A.15.1.2.2.2, A.15.1.2.3.2]

Sections A.15.1.2.2.2, A.15.1.2.3.2

~~A.15.1.2.2.2 —~~

~~*Table 15.1.2.2.2* . Use of FEMA 356, *Prestandard and Commentary for the Seismic Rehabilitation of Buildings* , requires the selection of a target building performance level at a specified earthquake hazard level. In most parts of the country, BSE-1 is consistent with the ASCE/SEI 7, *Minimum Design Loads for Buildings and Other Structures* , design level earthquake, and BSE-2 is consistent with the maximum considered earthquake (MCE).~~

~~A.15.1.2.3.2 —~~

~~*Table 15.1.2.3.2* . The use of ASCE/SEI 31, *Seismic Evaluation of Existing Buildings* , and FEMA 356, *Prestandard and Commentary for the Seismic Rehabilitation of Buildings* , requires the selection of a target building performance level at a specified earthquake hazard level. In most parts of the country, the earthquake hazard in ASCE/SEI 31 and the BSE-1 are consistent with the ASCE/SEI 7, *Minimum Design Loads for Buildings and Other Structures* , design level earthquake, and BSE-2 is consistent with the maximum considered earthquake (MCE).~~

Statement of Problem and Substantiation for Public Input

ASCE 31 and FEMA 356 are no longer the correct references.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 210-NFPA 5000-2015 [Sections 15.1.2.2, 15.1.2.3]	Clean up on ASCE 31/FEMA 356.
Public Input No. 210-NFPA 5000-2015 [Sections 15.1.2.2, 15.1.2.3]	

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Public Input No. 3-NFPA 5000-2015 [Chapter H]

Annex H Informational References

H.1 Referenced Publications.

The documents or portions thereof listed in this annex are referenced within the informational sections of this code and are not part of the requirements of this document unless also listed in Chapter 2 for other reasons.

H.1.1 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 1, *Fire Code*, 2015 edition.

NFPA 10, *Standard for Portable Fire Extinguishers*, 2013 edition.

NFPA 13, *Standard for the Installation of Sprinkler Systems*, 2013 edition.

NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes*, 2013 edition.

NFPA 13R, *Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies*, 2013 edition.

NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*, 2013 edition.

NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*, 2012 edition.

NFPA 22, *Standard for Water Tanks for Private Fire Protection*, 2013 edition.

NFPA 30, *Flammable and Combustible Liquids Code*, 2015 edition.

NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages*, 2015 edition.

NFPA 30B, *Code for the Manufacture and Storage of Aerosol Products*, 2015 edition.

NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals*, 2011 edition.

NFPA 55, *Compressed Gases and Cryogenic Fluids Code*, 2013 edition.

NFPA 58, *Liquefied Petroleum Gas Code*, 2014 edition.

NFPA 61, *Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities*, 2013 edition.

NFPA 68, *Standard on Explosion Protection by Deflagration Venting*, 2013 edition.

NFPA 70 ®, *National Electrical Code* ®, 2014 edition.

NFPA 72 ®, *National Fire Alarm and Signaling Code*, 2013 edition.

NFPA 80, *Standard for Fire Doors and Other Opening Protectives*, 2013 edition.

NFPA 80A, *Recommended Practice for Protection of Buildings from Exterior Fire Exposures*, 2012 edition.

NFPA 82, *Standard on Incinerators and Waste and Linen Handling Systems and Equipment*, 2014 edition.

NFPA 88A, *Standard for Parking Structures*, 2015 edition.

NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, 2015 edition.

NFPA 92, *Standard for Smoke Control Systems*, 2012 edition.

NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*, 2014 edition.

NFPA 99, *Health Care Facilities Code*, 2015 edition.

NFPA *101* ®, *Life Safety Code* ®, 2015 edition.

NFPA 101A, *Guide on Alternative Approaches to Life Safety*, 2013 edition.

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Statement of Problem and Substantiation for Public Input

Referenced current SDO names, addresses, standard names, numbers, and editions.

Related Public Inputs for This Document

Related Input	Relationship
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NFPA 1144, *Standard for Reducing Structure Ignition Hazards from Wildland Fire*, 2013 edition.

NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*, 2013 edition.

NFPA *Fire Protection Handbook* ®, 20th edition.

Fire Protection Research Foundation, *Development of an Enhanced Hazard Classification System for Oxidizers, National Oxidizing Pool Chemicals Storage Fire Test Project*, 1998.

Statement of Problem and Substantiation for Public Input

I proposed adding Annex information (A.55.1.4.2) to recommend commissioning of integrated fire protection and life safety systems. If that Public Input is accepted, this reference should be added.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 172-NFPA 5000-2015 [Section No. 55.1.4]	Adds a reference if PI 172 is accepted

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Public Input No. 198-NFPA 5000-2015 [New Section after H.1.2]

H.1.2.2 AISC Publications. American Institute of Steel Construction, One EastWacker Drive, Suite 3100, Chicago, IL 60601-2001.

AISC DG02, *Steel and Composite Beams with Web Openings,* 2003.

Statement of Problem and Substantiation for Public Input

This proposal is simply picking up the reference to AISC DG-02, which is mentioned in Annex A, Section A.44.2.1.

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Public Input No. 45-NFPA 5000-2015 [Section No. H.1.2.7]

H.1.2.7 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM ~~D 56~~ D56 , *Standard Test Method for Flash Point by Tag Closed Tester*, 2005 (2010).

ASTM ~~D 86~~ D86 , *Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure,* 2012.

ASTM ~~D 93~~ D93 , *Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester*, ~~2012~~ 2015 .

ASTM ~~D 2859~~ D2859 , *Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials*, 2006 (2011).

ASTM ~~D 3278~~ D3278 , *Standard Test Methods for Flash Point of Liquids by Small Scale Closed-Cup Apparatus*, 1996 (2011).

ASTM ~~D 3828~~ D3828 , *Standard Test Methods for Flash Point by Small Scale Closed Tester*, 2012a.

ASTM ~~E 84~~ E84 , *Standard Test Method for Surface Burning Characteristics of Building Materials,*~~2013~~ 2015a .

ASTM ~~E 96~~ E96 /~~E 96M~~ E96M , *Standard Test Methods for Water Vapor Transmission of Materials*, ~~2012~~ 2014 .

ASTM ~~E 119~~ E119 , *Standard Test Methods for Fire Tests of Building Construction and Materials,*~~2012a~~ 2014 .

ASTM ~~E 648~~ E648 , *Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source,* ~~2010 e1~~ 2014c .

ASTM ~~E 736~~ E736 , *Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members*, 2000 (2006).

ASTM ~~E 814~~ E814 , *Standard Test Method for Fire Tests of Through-Penetration Fire Stops,* ~~2011a~~ 2013a .

ASTM ~~E 1472~~ E1472 , *Standard Guide for Documenting Computer Software for Fire Models,* 2007 (withdrawn 2011).

ASTM ~~E 1592~~ E1592 , *Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference,* 2005.

ASTM ~~E 1966~~ E1966 , *Standard Test Method for Fire-Resistive Joint Systems,* 2007 (2011).

ASTM ~~E 2030~~ E2030 , *Guide for Recommended Uses of Photoluminescent (Phosphorescent) Safety Markings*, 2009a.

ASTM ~~E 2174~~ E2174 , *Standard Practice for On-Site Inspection of Installed Fire Stops*, 2009.

ASTM ~~E 2238~~ E2238 , *Standard Guide for Evacuation Route Diagrams*, 2012.

ASTM ~~E 2280~~ E2280 , *Standard Guide for Fire Hazard Assessment of the Effect of Upholstered Seating Furniture within Patient Rooms of Health Care Facilities*, ~~2009~~ 2013 .

ASTM ~~E 2307~~ E2307 , *Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-Story Test Apparatus*, ~~2010~~ 2015a .

ASTM ~~E 2393~~ E2393 , *Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers*, 2010.

ASTM ~~E 2484~~ E2484 , *Standard Specification for High-Rise Building External Evacuation Controlled Descent Devices*, 2008.

ASTM ~~E 2513~~ E2513 , *Standard Specification for Multi-Story Building External Evacuation Platform Rescue Systems*, 2007.

ASTM ~~F 1637~~ F1637 , *Standard Practice for Safe Walking Surfaces*, 2010.

ASTM ~~F 1677~~ F1677 , *Standard Test Method for Using a Portable Inclinable Articulated Strut Tester (PIAST),* withdrawn last edition, 1996.

ASTM ~~F 1679~~ F1679 , *Standard Test Method for Using a Variable Incidence Tribometer (VIT),* withdrawn last edition, 2004.

Statement of Problem and Substantiation for Public Input

date updates

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Public Input No. 195-NFPA 5000-2015 [Section No. H.1.2.11]

H.1.2.11 FM Global Publications.

FM Global, 270 Central Avenue, P.O. Box 7500, Johnston, RI 02919.

FM Data Sheet 1-22, *Maximum Foreseeable Loss,* ~~2009~~ 2014 .

FM Data Sheet 1-23, Fire Barriers and *Protection of Openings* ~~*in Fire Subdivisions*~~ , ~~2007~~ 2012 .

FM Data Sheet 1-29, *Roof Deck Securement and Above-Deck Roof Components,* ~~2009~~ 2010 .

FM Data Sheet 1-49, *Perimeter Flashing,* 2009.

FM 4450, *Approval Standard for Class 1 Insulated Steel Deck Roofs*, 1989.

FM 4470, Approval Standard for Single-ply, Polymer-Modified Bitumen Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for use in Class 1 and Noncombustible Roof ~~Covers~~ Deck Construction , ~~1986~~ 2012 .

FM 4471, *Approval Standard for Class 1 Panel Roofs*, ~~1995~~ 2010 .

ANSI/FM 4473, Test Standard for Impact Resistance Testing of Rigid Roofing Materials by Impacting with Freezer Ice Balls, 2011.

ANSI/FM 4880, *American National Standard for Evaluating Insulated Wall or Wall and Roof/Ceiling Assemblies, Plastic Interior Finish Materials, Plastic Exterior Building Panels, Wall/Ceiling Coating Systems, Interior or Exterior Finish Systems*, 2007.

Statement of Problem and Substantiation for Public Input

Updated all references to FM Global documents. All FM Global data sheets and approval test standards are available for free at fmglobal.com or fmapprovals.com.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 193-NFPA 5000-2015 [Section No. 38.5.2.1]	

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Public Input No. 176-NFPA 5000-2015 [Section No. H.1.2.18]

H.1.2.18 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

ANSI/UL 10B, *Standard for Fire Tests of Door Assemblies,* 2008, Revised ~~2009~~ 2015 .

ANSI/UL 10C, *Standard for Positive Pressure Fire Tests of Door Assemblies,* ~~2009~~ 2015 .

ANSI/UL 263, *Standard for Fire Tests of Building Construction and Materials,* 2003, Revised ~~2011~~ 2014 .

ANSI/UL 300, *Standard for Fire Testing of Fire Extinguishing Systems for Protection of Commercial Cooking Equipment*, 2005~~.~~ , Revised 2014

ANSI/UL 300A, *Extinguishing System Units for Residential Range Top Cooking Surfaces*, 2006.

ANSI/UL 580, *Standard for Tests for Uplift Resistance of Roof Assemblies*, 2006, Revised ~~2009~~ 2013 .

ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*, 2008, Revised ~~2010~~ 2013 .

ANSI/UL 1040, *Standard for Fire Test of Insulated Wall Construction*, 2009, Revised 2013.

ANSI/UL 1256, *Standard for Fire Test of Roof Deck Constructions*, 2013.

ANSI/UL 1479, *Standard for Fire Tests of Through-Penetration Firestops,* 2003, Revised 2012.

UL ~~Subject~~ 1588, *Outline of Investigation for Roof and Gutter De-Icing Cable Units,* 2002.

ANSI/UL 1715, *Standard for Fire Test of Interior Finish Material*, 1997, Revised 2013.

ANSI/UL 1897, *Standard for Uplift Tests for Roof Covering Systems*, 2004, Revised ~~2008~~ 2012 .

ANSI/UL 2079, *Standard for Tests for Fire Resistance of Building Joint Systems,* 2004, Revised ~~2012~~ 2014 .

ANSI/UL 2196, *Tests of Fire Resistive Cables*, 2001, Revised 2006.

UL 2424, *Outline of Investigation for Cable Marked Limited Combustible,* 2006.

UL, *Fire Resistance Directory*, ~~2013~~ 2014 .

UL, Subject 1724, *Outline of Investigation for Fire Tests for Electrical Circuit Protective Systems*, 2006.

Statement of Problem and Substantiation for Public Input

Proposed changes reflect updated editions of UL Standards.

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