NFPA TECHNICAL COMMITTEE ON MEANS OF EGRESS

MEMORANDUM

TO: Technical Committee on Means of Egress (BLD/SAF-MEA)

FROM: Ron Coté, P.E.

DATE: July 19, 2010

SUBJECT: Approval Committee Ballots for NFPA 1124

The enclosed ballots are in response to NFPA Standards Council Decision D #08-19, in which several NFPA Technical Committees were identified as “Approval Committees” for proposals on NFPA 1124, *Code for the Manufacturing, Transportation, Storage and Retail Sale of Fireworks and Pyrotechnic Articles*, pertaining to consumer fireworks retail sales. Draft (Pre-ROP) Committee Proposal CP#9 addresses NFPA 1124, Section 6.8 Means of Egress; Draft (Pre-ROP) Committee Proposal CP#10 addresses NFPA 1124, 7.3.14.3 Egress Capacity.

The material balloted by the NFPA 1124 Committee includes only the paragraphs that were revised. For a complete copy of NFPA 1124-2006, go to the Means of Egress E-committee page where it can be downloaded from the Committee Documents section.

In accordance with the NFPA Regulations Governing Committee Projects, the above actions must be letter balloted through BLD/SAF-MEA. In order to provide substantive feedback to PYR-AAA and the Standards Council, please include any comments you may have.

Please complete and return the attached letter ballots not later than Friday, August 6, 2010 to the attention of Linda MacKay by email to lmackay@nfpa.org or by fax to 617-984-7110.

RC/lm

Encl: MEA Ballot Form on Draft CP#9
       MEA Ballot Form on Draft CP#10
       NFPA 1124 TC Draft CP#9
       NFPA 1124 TC Draft CP#10
       NFPA 1124 TC Letter Ballot Final Results
With regard to the action on Draft CP #9 concerning Section 6.8 Means of Egress:

☐ AGREE  ☐ DISAGREE  ☐ ABSTAIN *

*If you Disagree or Abstain, reasons must be provided:

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

Sign Name:  _________________________________________
Print Name:  _________________________________________
Date:     __________________________________________

Return by:  Friday, August 6, 2010

To:  Linda MacKay, Administrative Assistant
Email:  lmackay@nfpa.org
Fax:   617-984-7110
Phone: 617-984-7409
With regard to the action on Draft CP #10 concerning 7.3.14.3 Egress Capacity:

☐ AGREE  ☐ DISAGREE  ☐ ABSTAIN

*If you Disagree or Abstain, reasons must be provided:

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

Sign Name: ____________________________________________
Print Name: ____________________________________________
Date: __________________________________________________

Return by: Friday, August 6, 2010

To: Linda MacKay, Administrative Assistant
Email: lmackay@nfpa.org
Fax: 617-984-7110
Phone: 617-984-7409
NFPA 1124-2006
Draft Committee Proposals
Approved for letter ballot at Committee Meeting, February 1 – 2, 2010, Salt Lake City, UT
These actions relate to item 4 in the Standards Council Decision, D#08-19 and are to be coordinated with the Safety to Life, Means of Egress Committee in accordance with Standards Council direction following the completion of the letter ballot by the Committee on Pyrotechnics.

Log# DRAFT CP#9
Submitter: Technical Committee on Pyrotechnics
Recommendation: It is proposed that Section 6.8 be amended to read as follows:

6.8 Means of Egress.

6.8.1 Means of egress in permanent consumer fireworks storage or work buildings or areas shall comply with the applicable requirements of NFPA 101, Life Safety Code.

6.8.2 Temporary trailers, semitrailers, and metal shipping containers that are not normally occupied shall not be required to comply with NFPA 101, Life Safety Code.

6.8.3 Doors.

6.8.3.1 Exterior Exit and exit access doors shall open in the direction of egress travel outward.

6.8.3.2 Doors in the means of egress shall be at least 36 in. (910 mm) wide and kept free of obstructions.

6.8.3.3 Exit Doors located within the means of egress that are capable of locking or latching shall be equipped with have approved panic or fire exit hardware.

6.8.3.4 Exit Doors located within the means of egress shall be unlocked from the egress side when the building is occupied.

6.8.4 Aisles.
6.8.4.1 Aisles shall be at least 36 in. (910 mm) wide and shall be kept free of obstructions.

6.8.4.2 Dead end aisles shall not exceed 50 ft (15.2 m) in length.

6.8.5 Egress Travel Distance. Exits provided for consumer fireworks storage or work buildings or areas shall be located such that the maximum egress travel distance as measured from the remotest point to an exit along the natural and unobstructed path of egress travel shall not exceed 200 ft (60.8 m).


6.8.7 Egress Capacity. Egress capacity shall be based on 0.7 in./person (18 mm/person) for stairs or 0.4 in./person (10 mm/person) for level components and ramps.

Substantiation:
For background information, the NFPA Pyrotechnics Technical Committee’s NFPA 1124 Task Group C contacted the NFPA Technical Committee (TC) on Means of Egress to request their technical review and input on the means of egress requirements of Chapters 6 and 7 of NFPA 1124 in an effort to provide a response to the NFPA Standards Council’s Fire Safety Concern Issue #4: Means of Egress Provisions as detailed in the Standards Council Decision D#08-19 which designated the NFPA Means of Egress TC as the Approval Committee for this Issue. The Chair of the Means of Egress TC assigned that request to a Task Group designated as the Means of Egress Technical Committee NFPA 1124 Task Group. The Task Group provided a response to the Means of Egress TC members which was also copied to the NFPA 1124 Task Group C for consideration in determining what revisions would be appropriate and necessary to Chapters 6 and 7 of NFPA 1124 to satisfy the concerns and issues raised by the Means of Egress TC NFPA 1124 Task Group.

In the Means of Egress TC NFPA 1124 Task Group response the Task Group relied heavily on the fact that they considered that buildings used for the storage or retail sales of consumer fireworks should have their hazard of contents classified as high hazard contents in accordance with Section 6.2.2.4 of NFPA 101-2009, rather than as ordinary hazard contents in accordance with Section 6.2.2.3. As part of their
rationale for making that determination, they referred to quantities of “flammable/explosive solid composition within the building.”

It should be noted that consumer fireworks and their packaging do not contain flammable materials but they are combustible. Nor are they classified as explosives. In fact, the Annex A note to the definition for “Consumer Fireworks” (Section 3.3.30.1 of NFPA 1124-2006) in Section A.3.3.30.1 Consumer Fireworks states: “Consumer fireworks that comply with the construction, chemical composition, and labeling regulations of the U.S. DOT for fireworks, 49 CFR 172, and the U.S. Consumer Product Safety Commission (CPSC) as set forth in CPSC 16 CFR 1500 and 1507, are not considered to be explosive materials for the purposes of this code.” By definition, consumer fireworks are those fireworks that comply with the criteria and the standards listed in the Annex A note. It should also be noted that the NFPA 1 Fire Code – 2009 extracts the definition for “Consumer Fireworks” from NFPA 1124 including the Annex A note. It can be found in Sections 3.3.115.1 and A.3.3.115.1 of NFPA 1.

The Means of Egress TC NFPA 1124 Task Group also claims that this creates a conflict with NFPA 1 and NFPA 5000 for high hazard contents, as well as with the NFPA 101 high hazard contents classification. However, it should be noted that there is no direct correlation between the hazard classification of contents in NFPA 101, including the high hazard contents classification, and the occupancy classifications in NFPA 1 and NFPA 5000, especially regarding High Hazard Contents Levels 1 through 5. Thus, the NFPA 1 and NFPA 5000 High Hazard Contents classification should not enter into the discussion or factor into or impact the means of egress requirements based on NFPA 101. The NFPA 101 hazard of contents classifications stand on their own when applying the means of egress requirements in NFPA 101.

Furthermore, the NFPA 101 classification scheme for hazards of contents is very subjective and qualitative. For example, for the ordinary hazard contents classification in Section 6.2.2.3 the phrases “likely to burn with moderate rapidity” and “give off a considerable volume of smoke” are subject to a great deal of interpretation. To further provide guidance, NFPA 101 has an Annex A note for the ordinary hazard contents classification in Section A.6.2.2.3 which indicates that ordinary hazard contents is a classification for the conditions found in most buildings. It goes on to say that it assumes there is no unduly dangerous exposure to toxic fire gases during the period necessary to escape from the fire area.
The NFPA Pyrotechnics TC believes that the NFPA 101 ordinary hazard contents classification is appropriate for the storage and retail sales of consumer fireworks. The TC further believes this has been adequately substantiated in the full-scale fire tests conducted by Southwest Research Institute (SwRI) for the American Fireworks Standards Laboratory (AFSL) in the report titled “Fire Performance Evaluation of Consumer Fireworks Retail Sales Displays Incorporating Various Fire Risk Mitigation Techniques,” SwRI Project No. 01.13626.01.001 dated November 26, 2008.

Similarly, the high hazard contents classification in Section 6.2.2.4 of NFPA 101 also uses rather subjective terminology such as the phrases “likely to burn with extreme rapidity” and “from which explosions are likely.” Again, an Annex A note in Section A.6.2.2.4 attempts to provide additional guidance on how to determine high hazard contents. It provides a nonexclusive list of various contents and conditions that are considered high hazard including “where flammable liquids are handled or used or are stored under conditions involving possible release of flammable vapors,” or “where grain dust, wood flour, or plastic dust, aluminum or magnesium dust, or other explosive dusts are produced,” or “where hazardous chemicals or explosives are manufactured, stored, or handled,” or “where materials are processed or handled under conditions producing flammable flyings.” Obviously, none of those materials or conditions are found in storage facilities containing consumer fireworks or in mercantile occupancies where consumer fireworks are sold at retail. Also, the SwRI full-scale fire tests, in the opinion of the NFPA Pyrotechnics TC, did not demonstrate that the fires burned, at least in consumer fireworks retail sales facility scenarios, with “extreme rapidity” nor did explosions occur where all of the mitigating fire safety features specified in NFPA 1124 were implemented. However, that was not the case in the two tests that were used as base line tests for comparison purposes where none of the mitigating features were provided based on NFPA 1124. There was a clear performance difference in how the fire initiated, grew, and generated smoke in the tests without mitigation measures versus those with the mitigation measures in place. Yet even where there were no mitigating features provided, no explosions occurred.

As a side note, it is interesting to see that the materials described in the Annex A note to the high hazard contents classification description are comparable to those found in the NFPA 1 and NFPA 5000 High Hazard Contents Levels 1 and 2 classifications, whereas consumer fireworks are classified as a High Hazard Contents Level 3.
Nevertheless, there are many provisions contained in NFPA 1124 that are based on the high hazard contents classification, not only in the means of egress requirements, but also in implementing other requirements where the Pyrotechnics TC felt it was appropriate to be more conservative and err on the side of safety. In fact, most of the requirements found in Section 7.11 Special Provisions for Occupancies With High Hazard Contents in NFPA 101 are also contained in Chapters 6 and 7 of NFPA 1124.

The following provides the additional rationale and substantiation for the specific revisions to Section 6.8 Means of Egress in NFPA 1124 Chapter 6 Storage of Consumer Fireworks. Most of these revisions are based on comments made by the Means of Egress TC NFPA 1124 Task Group.

Section 6.8.1 is being revised to eliminate the word “permanent” so that the means of egress requirements will apply to temporary, as well as permanent, consumer fireworks storage or work buildings or areas based on the applicable requirements of NFPA 101. Thus, temporary storage buildings used for consumer fireworks will also be required to comply with NFPA 101 as applicable.

Because of that revision, Section 6.8.2 is being revised to add the word “Temporary” to be applicable to the trailers, semitrailers, and metal shipping containers that are not normally occupied but may be located on-site for temporary storage of consumer fireworks, thus exempting such temporary facilities from complying with NFPA 101. This will be consistent with the revision made to Section 6.8.1.

Section 6.8.3.1 is being revised to clarify that the door swing requirement is to be in the direction of egress travel and is applicable to all exit and exit access doors as was the original intent.

Section 6.8.3.3 This Section is also being revised to clarify the requirement that any door located in the means of egress that could be locked or latched must be provided with approved panic hardware or fire exit hardware as was the original intent of this provision.

Section 6.8.3.4 Again, this section is being clarified to indicate that it applies to all doors located within the means of egress, requiring them to be unlocked from the egress side when the building is occupied as was the original intent of the section.
A new Section 6.8.6 Number of Means of Egress has been added to direct the user to NFPA 101 for the determination of the minimum number of means of egress required. This was felt to be a simpler approach than repeating the various conditions for the required number of means of egress specified in NFPA 101.

New Section 6.8.7 Egress Capacity is also being added to specify the egress capacity width per person based on that designated for high hazard contents in Table 7.3.3.1 Capacity Factors of NFPA 101. This is being proposed as a conservative measure for providing adequate egress capacity for storage occupancies storing consumer fireworks.

The following documents the Pyrotechnics TC’s reasons for not accepting other recommendations made by the Means of Egress TC NFPA 1124 Task Group in their report provided to the NFPA 1124 Task Group C.

It was suggested that Section 6.8.3.2 specifying the minimum width of doors in the means of egress be revised to be more consistent with the language contained in Section 7.2.1.2.3.2 of NFPA 101. However, the Pyrotechnics TC believes that those NFPA 101 requirements must still be met since Section 6.8.1 requires all means of egress to comply with the applicable requirements of NFPA 101, Life Safety Code. Section 6.8.3.2 is being provided as a user friendly requirement to cover one of the more important issues regarding the means of egress in these storage warehouses containing consumer fireworks. Clearly, a door having a minimum width of 36 inches will meet the minimum clear width specified in NFPA 101. This just makes it easier for the user to determine the minimum size door width needed to satisfy that requirement without having to do a detailed analysis in accordance with NFPA 101.

The Means of Egress TC NFPA 1124 Task Group refers to Table 42.2.5 of NFPA 101 regarding Section 6.8.4.2 specifying the maximum length for a dead end aisle of 50 feet. It should be noted that Table 42.2.5 allows a common path of travel for a maximum of 50 feet for an ordinary hazard contents storage building that is not protected with an automatic sprinkler system. That distance is allowed to be increased to 100 feet where an automatic sprinkler system is provided. Thus, the requirement in Section 6.8.4.2 is more restrictive than NFPA 101 in storage buildings greater than 12,000 sq ft in area since they are required to be sprinklered by Section 6.5.1 of NFPA 1124. As previously noted, the Pyrotechnics TC does not believe that the high hazard contents requirement for this condition should apply.
Section 6.8.5 Egress Travel Distance.

It was recommended that the distance of travel be measured in accordance with Section 7.6 of NFPA 101. But this is covered by the general reference to NFPA 101 in Section 6.8.1. It was also suggested that this section, which allows a maximum travel distance of 200 feet, does not address the high hazard contents travel distance limitation of 75 feet in Section 7.11.1. Again, this is a requirement related to high hazard contents whereas the Pyrotechnics TC believes the ordinary hazard contents classification for this condition has been justified. It should also be noted that Section 42.2.6 Travel Distance to Exits of NFPA 101 for storage occupancies of ordinary hazard contents allows a travel distance of 200 feet in a nonsprinklered building and 400 feet in a sprinklered building. Interestingly, the travel distance in a high hazard contents storage occupancy is allowed to be increased to 100 feet where automatic sprinklers are provided. In Section 6.8.5 of NFPA 1124, no credit is given to an increased travel distance in sprinklered storage buildings storing consumer fireworks.

Furthermore, employees in storage facilities containing consumer fireworks are required to have specialized U.S. DOT and OSHA training related to the special hazards of consumer fireworks. Thus, the employees are better prepared to react to a fire emergency. In fact, OSHA has adopted NFPA 1124 as the basis for their inspections of consumer fireworks workplaces including storage facilities. And, the consumer fireworks are required to be stored in DOT-approved packaging in accordance with Section 6.11.4. Section 3.3.25 of NFPA 1124 defines “DOT-Approved Packaging” as complying with the regulations of the U.S. Department of Transportation (DOT), Title 49 Part 178. An Annex A note in Section A.3.3.25 provides additional guidance on DOT-approved packaging for consumer fireworks where it states that the cartons are required to be marked and labeled in compliance with DOT regulations to indicate that fireworks are contained in the packaging.

The Means of Egress TC NFPA 1124 Task Group also suggested that a new section be added to require the minimum width of any means of egress to be not less than 36 inches based on Section 7.3.4.1 of NFPA 101. The Pyrotechnics TC did not feel that there was a need to do this since a general reference to NFPA 101 is already provided in Section 6.8.1. However, the minimum clear width requirements are spelled out in Chapter 6 of NFPA 1124 for the two most important means of egress elements that include the aisles in the storage warehouse area that are already required to be a minimum 36 inches wide and kept free of obstructions in accordance with Section 6.8.4.1 and the doors in the means of
egress that are also required to have a minimum width of 36 inches kept free of obstructions in accordance with Section 6.8.3.2 of NFPA 1124.

In conclusion, the Pyrotechnics TC believes the means of egress requirements in Chapter 6 of NFPA 1124 regulating storage buildings containing consumer fireworks have been adequately substantiated. Basically, NFPA 101 has been relied upon for all the requirements and additional restrictions have been specified where deemed necessary to provide for an increased factor of safety as appropriate for the means of egress in these storage buildings based on an ordinary hazard contents classification.

Committee Meeting Action: Accept
**Log# DRAFT CP#10**

**Submitter:** Technical Committee on Pyrotechnics

**Recommendation:** It is proposed that a new paragraph 7.3.14.3 be added to read as follows:

**7.3.14.3 Egress Capacity.** Egress capacity shall be based on 0.7 in./person (18 mm/person) for stairs or 0.4 in./person (10 mm/person) for level components and ramps.

Renumber the remaining subsections accordingly.

**Substantiation:**

It is interesting to note that the report of the Means of Egress Technical Committee (TC) NFPA 1124 Task Group to the Means of Egress TC members (which was copied to the NFPA Pyrotechnics TC’s NFPA 1124 Task Group C) regarding the NFPA Standards Council Fire Safety Concern Issue #4: Means of Egress Provisions did not contain any specific recommendations to revise or otherwise improve upon the current requirements specified in NFPA 1124 Section 7.3.14 Means of Egress in Chapter 7 Retail Sales of Consumer Fireworks.

However, the Means of Egress TC NFPA 1124 Task Group did provide a general reference to the high hazard contents classification suggesting that it may be more appropriate to apply the high hazard contents classification of NFPA 101 to Chapter 7 rather than the ordinary hazard contents classification. In that regard, it was suggested that Section 7.11 Special Provisions for Occupancies With High Hazard Contents should be applied to Chapter 7.

Although the Pyrotechnics TC does not consider a retail sales facility where consumer fireworks are sold to the public to have a high hazard contents classification, requirements for means of egress in occupancies with high hazard contents as found in Section 7.11 of NFPA 101 have been incorporated as appropriate into Chapter 7 where the TC determined that an additional factor of safety was prudent. Also, a new Section 7.3.14.3 Egress Capacity is being proposed to be added by this Committee Proposal to specify that the egress capacity is to be determined as required for high hazard contents based on Table 7.3.3.1 Capacity Factors of NFPA 101 by including the minimum width per person from that table.
Regarding Section 7.11.1 of NFPA 101 that limits the travel distance to the outside or a place of safety to not more than 75 feet, Section 7.3.14.2 Egress Travel Distance of NFPA 1124 does specify a maximum travel distance of 75 feet for the retail sales area of tents, membrane structures, canopies, and permanent CFRS facilities including Class C stores. However, the travel distance limits for Class A and Class B stores are allowed to be that specified in NFPA 101 for mercantile occupancies. Section 32.2.6.1 requires a maximum travel distance of 150 feet and Section 36.2.6.2 allows that distance to be increased to 200 feet where the building is protected throughout by an approved supervised automatic sprinkler system. It should be noted that the rationale for allowing these larger travel distances in Class A and B stores is because the area of the retail sales floor occupied by the retail displays of consumer fireworks is limited to a maximum of 25% of the area of the retail sales floor or 600 sq ft, whichever is less, in accordance with Section 7.5.1.1 of NFPA 1124. Plus there are other additional restrictions provided for the retail display of consumer fireworks in these Class A and Class B stores to minimize the exposure to the general public in these mercantile occupancies where the fireworks are sold as incidental merchandise as compared to a CFRS facility which is dedicated to the retail sales of consumer fireworks as the main merchandise being sold.

Section 7.11.4 of NFPA 101 requires a minimum of two means of egress to be provided from each building or hazardous area containing high hazard contents with a minor exception. It should be pointed out that Section 7.3.14.1.1 of NFPA 1124 requires not less than three exits be provided from the retail sales area where consumer fireworks are sold unless NFPA 101 requires a greater number. However, Section 7.6.2.3.1 of NFPA 101 allows retail sales areas within temporary CFRS stands to have a minimum of two exits where the travel distance is limited to a maximum of 35 feet in accordance with Section 7.6.2.3.2. It should also be noted that temporary CFRS stands are limited to a maximum area of 800 sq ft based on Item (4) of Section 7.3.5 Construction of Buildings and Structures in NFPA 1124.

Section 7.11.6 of NFPA 101 allows doors serving high hazard contents areas with occupant loads greater than five to have a latch or lock provided it is panic hardware or fire exit hardware. This is also addressed by Section 7.3.14.4.2 in NFPA 1124.

And, finally, it is interesting to note that Section 36.4.6 Retail Sales of Consumer Fireworks, 1.4G in NFPA 101 for new mercantile occupancies requires mercantile occupancies where consumer fireworks, 1.4G are sold to comply with NFPA 1124, as does Section 37.4.6 Retail Sales of Consumer Fireworks, 1.4G for
existing mercantile occupancies for other than approved existing facilities. And Section 36.4.5.3 Storage, Arrangement, Protection, and Quantities of Hazardous Commodities in NFPA 101 for new mercantile occupancies requires that “the storage, arrangement, protection, and quantities of hazardous commodities shall be in accordance with the applicable provisions of ... (8) NFPA 1124…” For existing mercantile occupancies, a similar requirement is found in Section 37.4.5.3 Storage, Arrangement, Protection and Quantities of Hazardous Commodities in NFPA 101. Thus, the Technical Committee on Mercantile and Business Occupancies has apparently determined that the means of egress requirements and other fire and life safety features in NFPA 1124 are adequate for providing reasonably safe means of egress in mercantile occupancies where consumer fireworks are sold at retail to the general public.

Committee Meeting Action: Accept
MEMORANDUM

TO: NFPA Technical Committee on Pyrotechnics
FROM: Jeanne Moreau
DATE: June 14, 2010
SUBJECT: NFPA 1124 A11 Draft Ballot Final Results – CP9 and CP10

The Final Results of the NFPA 1124 Draft Ballot are as follows:

32 Members Eligible to Vote
3 Ballots Not Returned (P. Grucci, G. Hanson, R. Robbins)

29 Affirmative on All
0 Negatives
0 Abstentions

The number of affirmative votes need for the report to be published is 20.
(32 eligible to vote - 3 not returned - 0 abstentions = 29 × 0.66 = 19.14)

In all cases, an affirmative vote of at least a simple majority of the total membership eligible to vote is required.
(32 of eligible voting members ÷ 2 = 16 (17)

Reasons for negative votes, etc. from alternate members are not included unless the ballot from the principal member was not received.

According to the final ballot results, all ballot items received the necessary 2/3 required affirmative votes to pass ballot.