



e-TechNotes

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Changes in Design Criteria Proposed for 2013 Edition of NFPA 13

As reported previously, the NFPA Sprinkler Committees will officially report proposed changes to the 2013 editions of their standards to the NFPA membership at the NFPA Annual Meeting scheduled for Las Vegas in June. Here are some of the most significant proposed changes relating to design criteria within NFPA 13:

5.6.4.4 – Since NFPA 13 protection criteria for plastics differs for expanded and unexpanded Group A plastics, additional guidance will be provided to help make this determination. *“Group A plastics shall be further subdivided as either expanded or nonexpanded. If a cartoned commodity is more than 40% (by volume) expanded plastic, it shall be protected as a cartoned expanded plastic. Exposed commodities containing greater than 25% by volume expanded plastic shall be protected as exposed, expanded plastic.”*

11.1.2(3) – A new subsection will clarify that a barrier partition is not needed to eliminate the requirement for more demanding design criteria to be carried at least 15 ft into the area protected under less demanding design criteria when the lower demand area is under a ceiling at least 2 ft lower than the higher demand ceiling.

11.3.1.2 – Where residential sprinklers are used in spaces adjacent to unsprinklered combustible concealed spaces, the minimum design area of 3,000 sq ft is being changed to a minimum design area of 8 sprinklers.

11.2.3.1.4(3) , 11.3.1.2.1 and 12.9.1 – For purposes of applying the minimum 3,000 sq ft (or 8-sprinkler for residential sprinklers) design area requirement for spaces adjacent to unprotected combustible concealed spaces, an additional sentence will read: *“The term ‘adjacent’ shall apply to any sprinkler system protecting a space above, below or next to the qualifying concealed space except where a barrier with a fire resistance rating at least equivalent to the water supply duration completely separates the concealed space from the sprinklered area.”*

11.1.7 and 12.1.4(4) – High Volume Low Speed (HVLS) fans will be required to have an interlock to shut down immediately upon receiving a waterflow signal from the alarm system.

12.1.3.4 – The section regarding excessive clearances is being rewritten, with a new first subsection addressing how to measure clearance to ceiling, and revisions of the subsections dealing with Chapters 16 and 17 as follows:

12.1.3.4.4 – Revised wording will clarify the maximum ceiling clearance for protection of rack storage of Class I-IV up to and including 25 ft in height: *“Where the clearance to ceiling exceeds 20 ft (6.1 m) for Section 16.2, protection shall be based upon the storage height that would result in a clearance to ceiling of 20 ft (6.1 m) or providing one level of supplemental, quick-response in-rack sprinklers located directly below the top tier of storage and at every flue space intersection.”*

12.1.3.4.5 – Revised wording will clarify the maximum ceiling clearance for protection of rack storage of Class I-IV over 25 ft in height and plastics up to and including 25 ft in height: *“Where the clearance to ceiling exceeds 10 ft (3.05 m) for Section 16.3 or Section 17.2, protection shall be based upon the storage height that would result in a clearance to ceiling of 10 ft (3.05 m) or providing one level of supplemental, quick-response in-rack sprinklers located directly below the top tier of storage and at every flue space intersection.”*

12.1.3.4.6 – A new section will clarify the maximum ceiling clearance for protection of rack storage of plastics over 25 ft in height: “Where the clearance exceeds 10 ft for Section 17.3, protection shall be based upon providing one level of supplemental, quick-response in-rack sprinklers located directly below the top tier of storage and at every flue space intersection.”

12.6.7.1 – A new section will state that “ESFR sprinklers designed to meet any criteria in Chapter 12 through Chapter 20 shall be permitted to protect light and ordinary hazard occupancies.”

12.6.7.2 – A new section will state that “Quick response CMSA sprinklers designed to meet any criteria in Chapter 12 through Chapter 20 shall be permitted to protect light and ordinary hazard occupancies.”

12.6.7.3 – A new section will state that “Standard response CMSA sprinklers designed to meet any criteria in Chapter 12 through Chapter 20 shall be permitted to protect ordinary hazard occupancies.”

12.7.7.3 – A new section will state that “The minimum design density for any sprinkler system installed in a storage occupancy shall be not less than 0.15 gpm per ft² after all adjustments are made.”

Table 12.12.1.2.(a) – The footnote that appeared to allow protection of idle wood pallets under ceiling heights greater than 30 ft is being eliminated.

12.12.2.2 – Criteria for protection of plastic pallets are being clarified. Within cutoff rooms, the allowance to use spray sprinklers at 0.6 gpm per sq ft for the entire room or high-expansion foam and sprinklers at 0.3 gpm per sq ft for the entire room will remain, but the allowance to use K-14 ESFR upright sprinklers will be eliminated.

Table 12.12.1.2(c), 12.12.2.1, 14.4.1, 15.4.1, 16.2.3.1, 17.2.3.1, 17.3.3.1, 18.4(d), and 19.1.2.3 – The 40 ft (12.2 m) ceiling-only option is being eliminated for the use of K-14 (200) ESFR sprinklers. Fire test data was provided indicating that protection problems could exist with certain ignition scenarios and 20 ft ceiling clearance. The K-14 ESFR sprinklers will be restricted to maximum 35 ft ceiling heights for ceiling-only applications.

13.2.3 A new section will address the use of extra hazard criteria for miscellaneous storage: “Where K-11.2(160) or larger sprinklers are used with EH1 or EH2 design curves from Figure 13.2.1, the design area shall be permitted to be reduced by 25 percent but not below 2,000 ft² (186 m²), regardless of temperature rating.”

13.3.4 – New criteria will be added for in-rack sprinklers protecting miscellaneous storage:

13.3.4.1 In-rack sprinklers for miscellaneous storage shall be located at the first tier level at or above one-half of the storage height.

13.3.4.2 Maximum horizontal spacing of in-rack sprinklers in single- or double-row racks with nonencapsulated, Class I, II, III, or IV commodities shall be in accordance with Table 13.3.4.2.

Encapsulated?	Aisle Width (ft)	Class I and II	Class III	Class IV
No	8	12	12	10
No	4	12	10	10
Yes	-	8	8	8

13.3.4.3 In-rack sprinklers shall be located in the longitudinal flue at the intersection of the transverse flues while not exceeding the maximum spacing rules. If no longitudinal flue is provided, in-rack sprinklers shall be located within 12 in. (300 mm) of the center of the rack while not exceeding the maximum spacing.

13.3.4.4 Where distances between transverse flues exceed the maximum allowable distances, sprinklers shall be installed at the intersection of the transverse and longitudinal flues and additional sprinklers shall be installed between transverse flues to meet the maximum distance rules.

13.3.4.5 Where no transverse flues exist, in-rack sprinklers shall not exceed the maximum spacing rules.

14.2.5 – A new section will allow the protection of encapsulated storage at storage heights up to 20 ft instead of the current 15 ft limitation within Chapter 14.

16.1.6 – The horizontal spacing (maximum 10 ft) and discharge criteria (minimum 30 gpm per sprinkler balanced to the ceiling demand) are being clarified for in-rack sprinklers installed under solid shelves, with the number of sprinklers to be included in the calculations ranging from six sprinklers where one level of in-racks is provided for Class I-III commodity to seven sprinklers on each of the top two levels where multiple levels protect Class IV commodity. New subsection 16.1.6.6 will state: *“The water demand for in-rack sprinklers shall not be required to be balanced to the ceiling sprinkler demand where additional face sprinklers are installed under each solid shelf at rack uprights and the in-rack sprinklers are calculated to discharge at least 60 gpm from 8 sprinklers.”*

16.1.6.3 – This section will be revised to clarify that where double-row racks with storage up to 25 ft have no longitudinal flue, the situation will not be considered as solid shelves where transverse flues exist at maximum 5 ft (1.5 m) intervals, and additional in-rack sprinklers are not required.

16.1.7 and 17.1.6 – New sections will state that protection of open-top containers is outside the scope of Chapters 16 and 17.

Table 16.2.1.3.2 and 16.2.1.3.6 – The phrase “without solid shelves” will be eliminated from the title of the table since it is intended to be used to establish the density/area and in-rack sprinkler requirements when solid shelves are present, as will be clarified by the new section.

17.1.5 – The maximum spacing between in-rack sprinklers under solid shelves will be restricted to 5 ft, with a minimum water demand per sprinkler of 30 gpm balanced to the ceiling system. Eight in-rack sprinklers will be included in the calculations if a single level is provided, or seven on each of the top two levels. A new subsection 17.1.5.6 will read the same as 16.1.5.6 stated above.

17.1.5.3 – A new section will state that where multiple-row racks of any height have no longitudinal flue, or double-row racks with storage up to 25 ft in height have no longitudinal flue, the situation will not be considered as solid shelves where transverse flues exist at maximum 5 ft (1.5 m) intervals, and additional in-rack sprinklers are not required.

17.2.1.4 – A new section will provide density/area discharge criteria for exposed unexpanded plastics stored up to 25 ft (7.6m) in height through the use of 12 figures that show different acceptable combinations of ceiling sprinkler discharge and in-rack sprinkler arrangements for different storage and ceiling heights. Previous standards only had protection criteria for cartoned plastics up to this storage height.

Table 18.4 (d) – Since the Committee recognizes that laced tire storage presents the most demanding protection challenge, the table will be revised to also allow on-side and on-tread storage configurations with protection criteria permitted for laced tire storage.

A.20.6.1 – A new annex section developed by an NFPA 13/NFPA 99 task group will provide guidance relative to protection of compact storage: *“NFPA 13 contains protection criteria for limited configurations of compact mobile storage units and materials stored. Storage commodities not specifically addressed in NFPA 13 are outside the scope of the standard (i.e. protection for commodities other than paper files, magazines or books in compact mobile storage units does not simply follow high piled storage protection criteria for shelves or racks). Where compact mobile storage configurations outside the scope of NFPA 13 are to be utilized, they must be addressed on a case by case basis with consideration given to the fact that no known sprinkler protection criteria is currently available. Additional protection features, such as rated construction, barriers within the storage, consideration for safe locating away from vulnerable areas, and methods for control or exhausting of the smoke, should be considered.”*

Chapter 21 – A new chapter will be entitled *“Alternative Sprinkler System Designs for Chapters 12 Through 20”* and will allow specific listings for storage sprinklers based on large scale fire tests. Section 21.1.6 will require *“a series of large scale fire tests involving challenging test scenarios that address the range of variables associated with the intended application of the sprinkler.”* The number of sprinklers to be included in the design area will be based on the worst-case result increased by a minimum 50 percent, but not less than 12 sprinklers for standard coverage sprinklers, 8 sprinklers for extended coverage sprinklers with 12 ft x 12 ft spacing, or 6 sprinklers based on 14 ft x 14 ft spacing. The minimum design area, based on proposed sprinkler spacing, would never be

permitted to be less than 768 sq ft (71 m²). Tables are being added to reflect current listings for extended coverage CMSA pendent K-25.2 upright sprinklers for ceiling-only wet system protection of palletized, solid pile, and rack storage of Class I-IV and cartoned unexpanded plastics up to 25 ft high under a 30 ft ceiling with a 6-sprinkler design area at minimum 30 psi, up to 25 ft high under a 35 ft ceiling with a 6-sprinkler design area at minimum 40 psi and up to 30 ft high under a 35 ft ceiling with an 8-sprinkler design area at minimum 40 psi. Annex material will help describe the required range of variables in the large-scale fire tests.

21.14.2.1 – To match recent changes to NFPA 75, supplemental sprinklers or gaseous fire protection systems will be required in the underfloor area of computer rooms if there is either a critical need to protect data in process, reduce equipment damage, facilitate the return to service, or if the area contains combustibile material.

22.4.4.1.1.4 and 22.4.4.1.1.5 – Two new subsections will address the situation of “straddle” design areas:

“Where the available floor area for a specific area/density design criteria, including any extension of area as required by 11.1.2 and 12.3, is less than the required minimum design area, the design area shall be permitted to only include those sprinklers within the available design area.

“Where the total design discharge from these operating sprinklers is less than the minimum required discharge determined by multiplying the required design density times the required minimum design area, an additional flow shall be added at the point of connection of the branchline to the cross main furthest from the source to increase the overall demand, not including hose stream allowance, to the minimum required discharge as determined above.”

Annex language is also being added to help clarify the intent with a step-by-step procedure for the calculation.

Table 22.4.4.7 – With the statement that “internal pipe inspections have revealed that dry galvanized systems have the same level of corrosion as black steel,” the Committee acted to remove the C-factor advantage for galvanized piping, such that all steel pipe will be assigned a C-factor of 120 for wet systems and 100 for dry pipe and preaction systems.

23.1.3.3 – Based on former annex language, a new section will address the need to consider the simultaneous domestic demand for combined lead-ins less than 4 in. (100 mm in diameter: *“When a single main less than 4 in. in diameter serves both domestic and fire systems, the domestic demand shall be added to the hydraulic calculations for the fire system at the point of connection unless provisions have been made to isolate the domestic demand.”* A new annex section will suggest that where domestic demand is considerable, it should also be considered in the calculations with 4-in. diameter combined lead-in piping.

Among the many rejected proposals, mention should be made of efforts to add text to the standard to allow treatment of piping interiors with an epoxy coating process. The piping interiors would be dried, corrosion then removed, and a profile for bonding created. The Committee rejected the addition of specific language that would recognize such a process, but provided the following committee statement:

“This technology is currently allowed when acceptable to the authority having jurisdiction under Section 1.6, New Technology, on a case by case basis. If this is an existing system, this needs to be addressed to NFPA 25. The committee has concerns that this type of product must be listed under the compatibility program to ensure any compatibility concerns. The committee is concerned that this is a technology that is not uniformly applicable to all systems.”

Upcoming NFSA “Technical Tuesday” Seminar – March 6th

Topic: Pumps and Standpipe Systems

Instructors: Kenneth E. Isman, P.E., NFSA Vice President of Engineering

Date: Tuesday, March 6, 2012- 10:30 am EST

This seminar will focus on selecting fire pumps to match the flow and pressure demand requirements of the standpipe system without over pressurizing portions of the system. This will include tall buildings with significant elevation head to overcome and buildings in seismic zones with two or more water supplies at different pressures. Where high pressure is a concern, the option of splitting the building into multiple vertical zones will be explored by using multiple pumps and by using a single pump with the master pressure reducing assembly permitted by NFPA 14.

To register or for more information, click [HERE](#) or contact Michael Repko at (845) 878-4207 or e-mail to seminars@nfsa.org.

Layout Technician Training Course (2-week course)

Fishkill, NY – October 8-19, 2012

For more information, contact Nicole Sprague using Sprague@nfsa.org or by calling 845-878-4200 ext. 149 or click [HERE](#).

Upcoming In-Class Training Seminars

The NFSA training department also offers in-class training on a variety of subjects at locations across the country, and in recognition of the current recession has adopted a new reduced fee structure. Here are some upcoming seminars:

Mar 1 (SPECIAL RATE!!)	Raleigh, NC	Inspection, Testing & Maintenance for the AHJ
Mar 6-8 Industry	Apple Valley, MN	3-Day Inspection & Testing for the Sprinkler
Mar 6	Pataskala, OH	Inspection, Testing & Maintenance for the AHJ
Mar 7	Pataskala, OH	Hydraulics for Fire Protection
Mar 8	Pataskala, OH	Sprinkler Protection of Special Storage
Mar 13 (SPECIAL RATE!!)	Louisville, KY	Inspection, Testing & Maintenance for the AHJ
Mar 13	Winston-Salem, NC	Hydraulics for Fire Protection
Mar 14	Winston-Salem, NC	Plan Review Policies & Procedures
Mar 20	Meridian, ID	Inspection, Testing & Maintenance for the AHJ
Mar 21	Meridian, ID	NFPA 13, 13R & 13D Update
Mar 22	Meridian, ID	Basic & Advanced Seismic Protection
Apr 3-4	Hillsboro, OR	NFPA 13 Overview
Apr 5	Hillsboro, OR	Sprinkler Protection for General Storage
Apr 10 (SPECIAL RATE!!)	Hayward, CA	Inspection, Testing & Maintenance for the AHJ
April 10-11	Willoughby, OH	Two-Day NFPA 13 Overview
April 12	Willoughby, OH	Inspection, Testing & Maintenance

Apr 12
(SPECIAL RATE!!)

Roseville, CA

Inspection, Testing & Maintenance for the AHJ

These seminars qualify for continuing education as required by NICET, and meet mandatory Continuing Education Requirements for Businesses and Authorities Having Jurisdiction.

To register for these in-class seminars, click [HERE](#). Or contact Michael Repko at (845) 878-4207 or e-mail to seminars@nfsa.org for more information.

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About the National Fire Sprinkler Association

Established in 1905, the National Fire Sprinkler Association (NFSA) is the voice of the fire sprinkler industry. NFSA leads the drive to get life-saving and property protecting fire sprinklers into all buildings; provides support and resources for its members – fire sprinkler contractors, manufacturers and suppliers; and educates authorities having jurisdiction on fire protection issues. Headquartered in Patterson, N.Y., NFSA has regional operations offices throughout the country. www.nfsa.org.