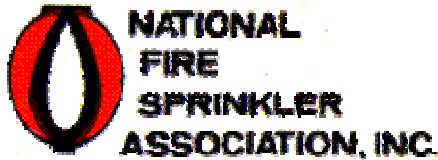


Tuesday e-Tech Alert

January 10, 2006



Cable in Concealed Spaces: When Does it Require Sprinklers?

An organization by the name of the Cable Fire Research Association (CFRA) has published an official-looking document on its www.cablefireresearch.org website entitled "Prior Notification of NFPA 13 Enforcement." The document claims to be intended to assist building departments, fire marshals and Authorities Having Jurisdiction in dealing with building owners, builders and contractors on the subject of limited combustible cable within ceiling plenums of sprinklered buildings. The following representation is made early in the paper:

"Jurisdictions throughout the United States have adopted NFPA 13, *Installation of Sprinkler Systems* (1999 and 2002), which requires the use of limited combustible cabling in the plenums of Type 1 sprinklered buildings, or the use of combustible cabling encased in metal conduit or fire protected with plenum sprinklers. Because this code requires both electrical and fire safety/building inspectors to evaluate the presence of combustible loading, clear and consistent communication, and prior notification of enforcement policy, is important to ensure compliance."

NFPA 13 is not nearly as specific as this statement indicates. Ironically, this incorrect interpretation of NFPA 13 is not required to carry the same disclaimer regularly used by this and other publications produced by organizations that actually participate in the NFPA 13 standards development process (see the paragraph at the very end of this *eTechAlert*). Since the Cable Fire Research Association is not involved in the production of NFPA 13, they are free to make any statements they choose to make.

To begin with, NFPA 13 does not address Type 1 buildings in any way. The standard differentiates only between those concealed spaces that are noncombustible versus those that have combustible surfaces and contents. While concealed spaces in Type 1 (fire resistive) buildings would normally be expected to be of noncombustible construction, so would the concealed spaces in Type 2 construction, which includes unprotected noncombustible construction.

The CFRA document includes a "checklist for sprinkler/fire safety inspectors" and a "checklist for electrical inspectors", both of which may cause problems in the field. It includes such erroneous statements as the following: "NFPA 13 requires that any plenum-rated cable not marked 'UL Limited Combustible FHC 25/50' is by definition combustible cable and must be protected by metal conduit or with plenum sprinklers." This is not true. While it is true that cable not listed as noncombustible or limited combustible would be considered combustible, Sections 8.14.1.2.3 through 8.14.1.2.15 of NFPA 13 (2002 edition) contain specific conditions under which sprinklers can be omitted from concealed spaces containing combustibles. Some of these sections contain guidance relative to the amount of combustibles that can be applied to the consideration of cable. Section 8.14.1.2.12, for example, allows omission of sprinklers where the

heat content of the facing and substrate of exposed combustible insulation material does not exceed 1000 BTU/sq. ft. Back in 1990, NFSA published an article in its *Sprinkler Quarterly* (No. 70) that included data developed by Factory Mutual on the heat potential of PVC-jacketed cable. Typical 3-conductor 12-gauge electrical cable used in residential and light commercial applications showed a heat of combustion of about 500 BTU per lineal foot, indicating a maximum two cables per square foot to avoid exceeding the 1000 BTU/sq. ft. threshold. Even where such loads are exceeded, as in a cable tray situation, Section 8.14.1.5 would allow localized protection of exposed combustibles with a row of sprinklers in an otherwise nonsprinklered space.

As it prepares the 2007 edition of NFPA 13, the Committee on Sprinkler System Installation Criteria is proposing to clarify the situation with annex language based on material that has been included in past editions of the NFPA's *Sprinkler Handbook*:

“A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc....can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.”

This CFRA publication appears to be part of a larger ongoing debate that surfaced during the recent development of the 2006 edition of NFPA 90A – *Installation of Air-Conditioning and Ventilating Systems*. Efforts were made by the 90A Committee to write cable specifications according to three levels of protection for plenums:

1. Unsprinklered plenums in sprinklered buildings
2. Unsprinklered plenums in unsprinklered buildings
3. Sprinklered plenums

The NFSA, along with the NFPA Technical Correlating Committee on Automatic Sprinklers, objected to the 90A committee getting involved in the sprinkler installation rules. Either the plenum is sprinklered or not, and while the 90A committee would be welcome to make a distinction in cable requirements on this basis if justified, the NFSA objected to the 90A committee trying to justify a difference in the impact of fire products from fires in these spaces based on whether there are sprinklers below the ceiling. Ultimately the entire subject was held for further study.

NFSA had suggested that NFPA 90A develop annex material providing guidance for its users relative to the fact that most above-ceiling spaces in sprinklered buildings are not protected with sprinklers per the rules of NFPA 13, which presently does not make a distinction between whether the space is used as a plenum or not. The rules of NFPA 13 could be referenced and extracted if necessary. Architects and others would have to recognize that if they wanted sprinklers in these plenum spaces for the purpose of allowing a wider range of cables, they should specify such additional sprinkler protection. In the NFSA view, the situation is similar to the building code allowance for larger draftstop spacing in sprinklered attics in buildings that can be protected by NFPA 13R sprinkler systems. If building designers are counting on the sprinklers to be there, they had better clearly specify them. The sprinkler contractor is obligated to respond to a

specification, but otherwise is not obligated to provide more sprinklers than required by the sprinkler standard.

There is another aspect to this issue involving the cost of providing sprinklers. One reason North America uses many more sprinklers than Europe is that they can be installed more economically, and eliminating sprinklers from typical above-ceiling spaces is a big part of that economy. The NFSA does not like to see costs added to the sprinklered building, whether it is the result of putting either extra sprinklers or more expensive cable above the ceiling. If the NFPA 90A debate leads to a better definition of what types and amounts of cables are permitted only in a sprinklered plenum space, then that information could be fed back to NFPA 13 for better guidance relative to the thresholds of cable that would pull sprinklers into an above-ceiling space used as a plenum, but the sprinkler committee would also have to consider whether some higher threshold applied to above-ceiling and other concealed spaces not used as plenums.

Upcoming NFSA Technical Tuesday Online Seminar

Topic: Standard Spray Upright and Pendent Sprinklers

Instructor: Kenneth E. Isman, NFSA Assistant Vice President of Engineering

Date: January 24, 2006

The history of the development of the standard spray sprinkler will be explored along with the fundamental concepts that underlie the requirements for installation. Included are answers to frequently asked questions regarding sprinkler spacing and location as well as occupancy selection criteria. To register go to www.nfsa.org.

2006 Basic and Advanced Technician Training, NICET Inspection Seminars

The NFSA is the only organization that offers two-week basic technician training seminars, 3-day advanced technician training seminars, and NICET-oriented inspection and testing review seminars at various locations across the U.S. The 2006 schedule:

2-week Basic Technician Training

March 6-17, 2006 – Chicago, IL

August 14-25, 2006 – Seattle, WA or Denver, CO

October 16-27, 2006 – Philadelphia, PA

3-day Advanced Technician Training

April 18-20, 2006 – Chicago, IL

May 16-18, 2006 – TBD

October 3-5, 2006 – Minneapolis, MN

3-day NICET Inspection and Testing Certification Review

January 9, 10, 11, and 12, 2006 – first day of split sessions in five FL locations

January 24-26, 2006 – New Jersey

February 22-24 – Phoenix, AZ

February 28-March 2 – Washington State

May 9-11 – Washington State

June 27-29 – Anchorage, AK

July 11-13 – Edwards, CO

For more information, contact Nicole Sprague using Sprague@nfsa.org
To register visit www.nfsa.org.

Spring 2006 Onlines Announced

For the Online Seminar Series in the first half of 2006, the NFSA has decided to focus on sprinklers and nozzles. The programs will be as follows:

Date	Topic	Instructor
Jan. 24	Standard Spray Upright and Pendent Sprinklers	Kenneth E. Isman, P.E.
Feb. 7	Standard Spray Sidewall Sprinklers	Kevin J. Kelly, P.E.
Feb. 21	Extended Coverage and Quick Response Sprinklers	Kenneth E. Isman, P.E.
Mar. 7	Residential Sprinklers	Victoria B. Valentine, P.E.
Mar. 21	ESFR, Large Drop and Specific Application Sprinklers	Kevin J. Kelly, P.E.
Apr. 4	Dry Sprinklers	Russell P. Fleming, P.E.
Apr. 18	Special Sprinklers	Cecil Bilbo, Jr.
May 9	Sprinkler Aesthetics and Protective Coverings	Russell P. Fleming, P.E.
May 23	Spray Nozzles and Directional Sprinklers	Cecil Bilbo, Jr.
June 13	Water Mist Nozzles	Victoria B. Valentine, P.E.

The level of all seminar topics is considered intermediate. A 30% discount is available when signing up for all ten seminars in the series.

NFSA Tuesday e-Tech Alert is c. 2006 National Fire Sprinkler Association, and is distributed to NFSA members on Tuesdays for which no NFSA Technical Tuesday Online Seminar is scheduled. Statements and conclusions are based on the best judgment of the NFSA Engineering staff, and are not the official position of the NFPA or its technical committees except as noted. Please send comments to Russell P. Fleming, P.E. fleming@nfsa.org.