



Tuesday e-Tech Alert
March 27, 2007
Number 79

Overhead Chain Conveyor Screen Guard Guidance

Useful fire test information is sometimes presented to the NFPA technical committees that, for one reason or another, never finds its way into the standards. The *Report on Proposals* and *Report on Comments* published by NFPA during the standards development process provide a record that can be mined for useful nuggets.

During the development of the 2007 edition of NFPA 13, the fire protection staff of General Motors submitted test data that they believed demonstrated that a screen guard located below an overhead conveyor in an assembly plant did not unduly interfere with ceiling sprinkler protection. The Committee was of the opinion that this information related to a unique situation specific to one user, and lacked the broad application that would justify its inclusion in the standard. They acknowledged, however, that this data could be presented to an Authority Having Jurisdiction for consideration in such special cases using the equivalency clause (Section 1.5 in the 2007 edition).

The language proposed by General Motors reveals the details of the testing that was performed:

Proposed 3.7.3 Conveyor Screen Guard. Material utilized to prohibit product or conveyor assemblies from coming in contact with operations or personnel below. The screen guard is provided with minimum openings of at least 2 in. x 4 in., the thickness of the mesh does not exceed 0.33 in. (8.4 mm) diameter, and such openings constitute a minimum of 75 percent of the area of the screen guard material.

Proposed 8.14.14 Sprinklers shall not be required below 2 in. x 4 in. conveyor screen guards in industrial facilities, utilizing ceiling sprinkler densities of 0.30 gpm/ft² or greater.

Proposed 8.14.14.1 Sprinklers shall be omitted under conveyor screen guard, conveying large panels when the panels are suspended in the vertical position, with a ceiling density of 0.60 gpm/ft² or greater.

Proposed 8.14.14.2 Regardless of ceiling sprinkler spray pattern, sprinkler protection shall be required below conveyor screen guard when panels are in the horizontal position, and exceed 48 in. in width.

Proposed 8.14.14.3 The installation of sprinklers beneath screen guard over aisles shall not be required.

Proposed annex material:

A series of five full scale fire tests were conducted to simulate obstructions to the ceiling automatic sprinkler systems in the presence of screen guard and by components hanging vertically on an overhead chain conveyor as in an assembly plant. The essential purpose of these tests was to determine the magnitude of automatic sprinkler water discharge pattern obstructions from conveyor screen guarding in assembly operations.

The burning fuel package (commodity) used in this investigation was standard cartoned unexpanded Group A plastic. The storage arrangement consisted of a four by four by two high palletized array (15.5 ft long x 15.5 ft wide x 8.5 ft high). In Tests Numbers 2-5 this fuel package was centrally positioned underneath a 20 ft x 20 ft wire mesh screen guard with a nominal 2 in. x 4 in. opening at the 10 ft level and a simulated overhead conveyor assembly at the 19 ft level. This combination of conveyor and screen guard was located beneath the full scale cone calorimeter at a recognized laboratory.

The sprinkler system was designed with the following parameters: 165 degree F, standard RTI, K-11.2 upright, 28 ft above finished floor, and 10 ft x 10 ft spacing. Fire tests were conducted... (and evaluated for)... flame spread through the palletized array, total and convective heat release rate versus time, and approximate consumption of commodity.

Test Descriptions and Results

Test 1 - No screen guard installed, with a sprinkler design of 0.30 gpm/ft² – Baseline test confirmed control of the burning commodity.

Test 2 - Screen guard installed, with a sprinkler design of 0.30 gpm/ft² – This test confirmed steady state control of the burning commodity.

Test 3 - Screen guard installed, with eight 4 ft x 4.5 ft panels and with a sprinkler design of 0.30 gpm/ft² – This test had to be terminated at approximately 6.5 minutes due to excessive heat release rates.

Test 4 - Screen guard installed, with eight 4 ft x 4.5 ft panels and with a sprinkler design of 0.60 gpm/ft² – This test established control and suppressed the Group A plastic commodity fire.

Test 5 - Screen guard installed, with six 4 ft x 5 ft panels and with a sprinkler design of 0.60 gpm/ft² – This test established control and suppressed the Group A plastic commodity fire.

These tests determined that with a ceiling sprinkler system of 0.30 gpm/ft² applied water density, the presence of the 2 in. x 4 in. wire mesh screen guard and a simulated overhead chain conveyor system did to some extent influence the efficiency of an operating sprinkler system to the burning stored Group A plastic commodities stored underneath the screen guard.

Also the tests proved that by introducing one more level of obstruction, i.e. the eight vertical panels suspended from a simulated conveyor system above the screen guard, the 0.30 gpm/ft² applied water density no longer controlled the burning of the palletized Group A plastic commodity and the test had to be terminated due to excessive heat release rate.

A further increase of the applied water density to 0.60 gpm/ft² established control and suppressed the Group A plastic commodity fire for both the previously tested panels for the simulated conveyor arrangement tested.

NICET Passes Certification Milestone

At the end of February the National Institute for Certification in Engineering issued a press release noting that it had passed a significant threshold earlier in the month: the 20,000th certification awarded in the field of fire protection technology. This is a considerable accomplishment for the program that was initiated when NFSA first approached NICET in 1978 with a proposal that they test and certify in the area of sprinkler layout and detailing. From the beginning NFSA encouraged NICET to plan for other subfields in fire protection, and the fire alarm technician program has become the largest fire protection certification area. As of the beginning of March the number of certifications in the various categories stood as follows:

Automatic Sprinkler Systems Layout = 4606
Special Hazards Systems Layout = 558
Fire Alarm Systems = 12265
Inspection and Testing of Water-Based Systems = 1461
Special Hazards Suppression Systems = 1254

Upcoming “Technical Tuesday” Online Seminars – April 3 and 10

Topic: Changes to the Seismic Protection Rules

Instructor: Victoria B. Valentine, P.E., NFSA Manager of Product Standards

Date: April 3, 2007

This program will focus on the dramatic changes in the seismic protection rules in Chapter 9 of NFPA 13, including the complete rewrite of the tables used for sizing and spacing earthquake braces and the incorporation of the previously issued TIA into the new standard. The information in this program is not limited to fire sprinkler systems since many other water-based fire protection system standards reference NFPA 13 for the seismic protection rules.

Topic: Changes to Storage Protection Requirements

Instructor: Russell P. Fleming, P.E., NFSA Executive Vice President

Date: April 10, 2007

Note: This seminar was originally scheduled for April 17th

Chapter 12 in the 2002 edition of the standard has been expanded into 9 new chapters in the 2007 edition of the standard (new Chapters 12 through 20). Each of these new chapters will focus on a type of storage arrangement for a specific commodity. This seminar will explore the new format and comment on the major changes including the philosophical change in the protection of Miscellaneous Storage as Ordinary Hazard or Extra Hazard rather than treating such situations as “storage”. It will also look at the implications of some of the proposed clarifications to storage rules that were sidelined by floor action when the 2007 edition was presented to the NFPA membership.

Information on registration for these seminars is available at www.nfsa.org or by calling Dawn Fitzmaurice at 845-878-4200 ext. 133 or email: dawn@nfsa.org.

Upcoming NFSA “Business Thursday” Online Seminar – April 19th

Topic: Dealing with the AHJ during the Final Inspection

Instructor: Jeff Hugo, NFSA Regional Manager, Great Lakes Region

Date: April 19, 2007

The job is done, and the final request for inspection is scheduled. This Business Thursday seminar will address scheduling, timing, inspection, and follow up of the final inspection. Many final inspections can make or break your performance with the owner, general contractor, and relationship with the building and fire department. Attend this seminar to give you an advantage over your competition and fellow sub-contractors.

Information and registration for this seminar is available at www.nfsa.org or by calling Dawn Fitzmaurice at 845-878-4200 ext. 133 or email: dawn@nfsa.org.

Additional NFSA Training Opportunities

Two-Week Technician Training Seminar

September 24- October 5 Kansas City, MO

These seminars also serve as starting points for the NFSA’s two-year Certificate Program for Fire Sprinkler Technicians. For more information, contact Nicole Sprague at 845-878-4200 ext. 149 or email: Sprague@nfsa.org.

3-day Advanced Technician Training Classes

July 24-26 Chicago, IL
September 5-7 St Louis, MO

For more information, contact Nicole Sprague at 845-878-4200 ext. 149 or email: Sprague@nfsa.org.

NICET Inspector Certification Review Classes

May 22-24 Anchorage, AK
June 19-21 Wilmington, DE
August 14-16 San Antonio, TX
November 6-8 Providence, RI

For more information, contact Nicole Sprague at 845-878-4200 ext. 149 or email: Sprague@nfsa.org.

In-Class Training Seminars

NFSA also offers in-class training on a variety of subjects at locations across the country. Here are some upcoming seminars:

- Mar 29 Hydraulics for Fire Protection////McFarland, WI
- Apr 3 Plan Review Policies & Procedures////San Bernardino, CA
- Apr 4 Sprinkler Protection for Rack Storage////San Bernardino, CA
- Apr 5 Inspection, Testing & Maintenance////San Bernardino, CA
- Apr 17 Sprinkler Protection for General Storage////Bozeman, MT
- Apr 18 Sprinkler Protection for Rack Storage////Bozeman, MT
- Apr 19 Inspection, Testing & Maintenance////Bozeman, MT
- May 2 Foam Water Systems (1/2 day) (AM)////Las Vegas, NV
- May 2 Advanced Pump Layout Procedures (1/2 day)(PM)////Las Vegas, NV
- May 8 Inspection, Testing & Maintenance////Colorado Springs, CO
- May 9 Residential Sprinklers Homes to High-Rise////Colorado Springs, CO
- May 10 Underground Piping (1/2 day) (AM)////Colorado Springs, CO
- May 10 Standpipe Systems (1/2 day) (PM)////Colorado Springs, CO
- May 15-16 Two-day NFPA 13 Overview & Intro to Plan Review////Richmond, CA
- May 17 Inspection, Testing & Maintenance////Richmond, CA
- May 29-30 Two-day NFPA 13 Overview & Intro to Plan Review////Rogers, AR
- May 31 Hydraulics for Fire Protection////Rogers, AR

For more information or to register, visit www.nfsa.org or call Michael Repko at 845-878-4207 or email: seminars@nfsa.org.

NFSA Tuesday e-Tech Alert is c. 2007 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 or those of other organizations except as noted. Opinions expressed herein are not intended, and should not be relied upon, to provide professional consultation or services. Please send comments to Russell P. Fleming, P.E. fleming@nfsa.org.

In the promotion of the fire sprinkler concept, the National Fire Sprinkler Association represents all fire sprinkler industry interests including fire sprinkler contractors, manufacturers and suppliers of fire sprinklers and related equipment and fire protection professionals. Established in 1905, the National Fire Sprinkler Association provides publications, nationally accredited seminars, representation in codes and standards-making, market development, labor relations and other services to its membership. Headquartered in Patterson, New York, the National Fire Sprinkler Association has regional operations offices throughout the country.