NATIONAL FIRE SPRINKLER ASSOCIATION, INC.

Tuesday e-Tech Alert
May 9, 2006

IBC Smoke and Heat Venting Requirements Now Exempt ESFR

The International Building Code is now the most widely-adopted model code in the United States. Among its requirements are those relating to roof venting in manufacturing and storage facilities. This section is relatively unchanged over the three published editions of the IBC (2000, 2003 and 2006). In all three editions the basic criteria can be found in Section 910 and can be summarized as follows:

Where required

- In the roofs of one-story buildings of Group F-1 (moderate hazard factory-industrial) and S-1 (moderate hazard storage) occupancies having more than 50,000 sq. ft (4645 m^2) in undivided area or where maximum exit access travel distance has been increased in accordance with the "roof vent increase" option.

- In occupancies classified as Group H (high hazard)-2 or H-3 if over 15,000 sq. ft. (in single floor area or if used for storing Class 2,3, or 4 liquid and solid oxidizers, Class 1 and unclassified detonable organic peroxides, Class 3 and 4 unstable (reactive) materials, or Class 2 and 3 water-reactive materials as required for a high-hazard (Class V) commodity classification. *Exception:* Buildings of noncombustible construction containing only noncombustible materials. *(NOTE: This set of requirements applicable to roof vents in Group H occupancies was deleted as part of the 2005 amendments to the 2003 edition on the basis that it was archaic and did not consider interaction with other requirements for these occupancies. As such, it is not contained in the 2006 IBC)*

- In buildings and portions thereof containing high-piled combustible stock or rack storage in any occupancy group. *Exception:* Frozen food warehouses used solely for Class I and II commodities where protected by an approved automatic sprinkler system.

- For emergency ventilation on stages larger than 1000 sq. ft (93 m^2) in floor area or with stage height greater than 50 ft (15.2 m) as an alternate to smoke control system.

Design Criteria - Operation

- Smoke and heat vents must be approved and labeled and be capable of operation by automatic and manual means.

- Where installed in non-sprinklered buildings, smoke and heat vents must operate automatically by actuation of a heat-responsive device rated at between 100°F (38°C) and 220°F (104°C). *Exception:* Gravity-operated drop-out vents are permitted if fully open within 5 minutes after the vent cavity is exposed to a simulated fire, represented by a time-temperature gradient that reaches an air temperature of 500°F (260°C) within 5 minutes.

- Where installed in sprinklered buildings, smoke and heat vents must operate automatically.

Draft Curtains

- Draft curtains must be provided for the occupancies with roof vents with spacing in accordance with a table based on occupancy group and height of storage. *Exception:* Draft curtains must not be provided within areas of buildings equipped with early suppression fast response (ESFR) sprinklers. Draft curtains can be provided at the separation between ESFR sprinklers and conventional sprinklers.

Mechanical Smoke Exhaust

- Where approved by the building official, engineered mechanical smoke exhaust is an acceptable alternate to smoke and heat vents.

The 2006 IBC ESFR Exemption

An important change to the 2006 edition, however, was the addition of a new exception to the base requirement. Alongside the exemption for sprinkler-protected frozen food warehouses used solely for storage of Class I and II commodities there is a new general exemption for all areas protected by ESFR sprinklers. So, not only will draft stops not be required in ESFR-protected areas, neither will automatic roof vents. In areas using earlier editions of the IBC, this change can be referenced for support in eliminating roof vents on the basis that it represents the current state of knowledge.

There is no question that opening of roof vents can adversely affect the operation of ESFR sprinklers. The sprinklers are sensitive enough that the opening of a roof vent can alter the opening pattern of the sprinklers, allowing sprinklers remote from the fire to open, reducing the water supply available to sprinklers over the fire. When ESFR sprinklers are installed and maintained correctly, they are expected to address the fire before roof vents are needed.

What about the interaction of roof vents with other types of sprinklers? Several fire test programs have looked at the interaction of roof vents and sprinklers and concluded that roof vents can adversely affect the operation of other sprinklers as well. Roof vent advocates, however, claim that the vents are helpful in situations involving inadequate sprinkler performance.

NFPA 13 Requirements

What does NFPA 13 say about roof vents? Section 12.1.1 (2002 edition) simply states the following: “Roof Vents and Draft Curtains. Sprinkler protection criteria are based on the assumption that roof vents and draft curtains are not being used.” As such, efforts should be made to ensure that automatic roof vents do not operate prior to sprinklers. Traditionally this is accomplished by using higher temperature ratings for the fusible links on automatic vents, often 360^{o}F (182^{o}C). Note that the IBC requirement that vents be activated by mechanisms rated between 100^{o}F (38^{o}C) and 220^{o}F (104^{o}C) only applies to nonsprinklered buildings. With higher rated links the roof vents can be installed in accordance with the building code, but will not be expected to operate assuming the sprinklers successfully limit ceiling temperatures.

Upcoming NFSA Technical Tuesday Online Seminar

NOTE: This online seminar was rescheduled from the original May 9, 2006 date

Topic: Sprinkler Aesthetics and Protective Coverings
Instructor: – Russell P. Fleming, P.E., NFSA Executive Vice President
Date: May 16, 2006

NFPA 13 defines recessed, flush and concealed sprinklers but does not separately present requirements applicable to their proper use as ceiling sprinklers, and only briefly discusses the expected differences in their performance. NFPA 13 also contains requirements relating to escutcheons and cover plates, guards and shields, and requirements for special coatings that can be either protective or ornamental coatings. Also included are aspects relating to earthquake protection requirements and to the inspection, testing and maintenance requirements of NFPA 25.

Information and registration for this seminar is available at 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 United States. The 2006 schedule has been set for the following dates and locations:

2-week Basic Technician Training

August 14-25, 2006 – Seattle, WA
October 16-27, 2006 – Philadelphia, PA

3-day Advanced Technician Training

October 3-5, 2006 – Minneapolis, MN

3-day NICET Inspection and Testing Certification Review

June 27-29, 2006 – Sugarland, TX
July 11-13, 2006 – Edwards, CO
September 6-8, 2006 – Dallas, TX
November 14-16, 2006 – Anchorage, AK

For more information, contact Nicole Sprague at Sprague@nfsa.org

NFSA In-Class Training Opportunities

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

May 16-17	Richmond, CA	Plan Review & Inspection

May 18	Richmond, CA	Underground Piping (1/2 day)
May 18	Richmond, CA	Seismic Protection (1/2 day)
May 23-24	Freeland, MI	Plan Review & Inspection
May 25	Freeland, MI	Residential: Homes to High-Rise
May 23-24	Murray, UT	Plan Review & Inspection
May 25	Murray, UT	Hydraulics for Fire Protection
May 23	Spokane, WA	Sprinkler Protection for General Storage
May 24	Spokane, WA	Sprinkler Protection for Rack Storage
May 25	Spokane, WA	Hydraulics for Fire Protection
June 13	Quogue, NY	Residential: Homes to High-Rise
June 14	Quogue, NY	Inspection, Testing & Maintenance
June 15	Quogue, NY	Standpipe Systems (1/2 day)
June 13	Lake Jackson, TX	Inspection, Testing & Maintenance
June 14	Lake Jackson, TX	Pumps for Fire Protection
June 15	Lake Jackson, TX	Sprinklers for Dwellings
June 20-21	Bozeman, MT	NFPA 13 Overview & Plan Review
June 22	Bozeman, MT	Hydraulics for Fire Protection
June 20	Dallas/Fort Worth, TX	Sprinkler Protection for General Storage
June 21	Dallas/Fort Worth, TX	Sprinkler Protection for Rack Storage
June 22	Dallas/Fort Worth, TX	Sprinkler Protection for Special Storage
June 27	Oak Creek, WI	Introduction to Sprinkler Systems (1/2 day)
June 28	Menomonee Falls, WI	Inspection, Testing & Maintenance
June 29	Oak Creek, WI	Residential: Homes to High-Rise
June 28	Wilmington, DE	Pumps for Fire Protection
June 29	Wilmington, DE	Standpipe Systems (1/2 day)
June 29	Wilmington, DE	Seismic Protection (1/2 day)
June 30	Wilmington, DE	Inspection, Testing & Maintenance

For more information or to register, visit www.nfsa.org or call 845-878-4207.

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.