NFSA Seminar Information Sheet

Seminar Title: Sprinkler Protection of Storage

Seminar Description: Storage occupancies present unique challenges to sprinkler system design and installation. NFPA 13 has complex and varying rules for the protection of stored commodities. This fast paced and interactive seminar will explore these requirements as they are related to types of commodities, storage configurations and special storage situations. The participant will be guided through a series of decisions and requirements that lead to compliance with NFPA 13 and ensure the system will operate properly when needed.

Attendees should bring a copy of the NFPA 13 with them.

Duration: 2 Days

Number of Modules: 9

Total Instructional Contact Minutes: 780 min. (1.4 CEUs and 14CPD)

Learning Outcomes:

At the conclusion of this seminar, participants will be able to:

1. Recognize the basic differences among various commodities stored in accordance with NFPA 13.
2. Identify the general parameters used in the storage of all commodities in accordance with NFPA 13, including Class I-IV commodities, Plastics, mixed commodities, & idle pallets.
3. Recognize the method of determining classifications for unknown commodities.
4. Discuss how the classification of a commodity can be affected by its storage on different type pallets.
5. Describe how changes in a commodity affect the owner’s responsibilities under NFPA 25.
6. Identify & discuss definitions and rules that apply to all storage arrangements, including the storage of idle pallets & high ceiling rules.
7. Recognize and discuss the basic purpose of Miscellaneous storage, its proper usage, and apply the appropriate rules for protection of those areas in for various arrangements using various sprinklers.
8. Discuss the definitions and rules specific to the general storage of commodities.
9. Apply the various design rules to examples of General storage arrangements by applying design criteria for various arrangements using various sprinklers.
10. Discuss the definitions and rules specific to the Rack storage of commodities.
11. Apply the various design rules to examples of Rack storage arrangements by applying design criteria for various arrangements using various sprinklers.
12. Discuss the definitions and rules specific to the storage of Rubber Tires.
13. Apply the various design rules to examples of Rubber Tire storage arrangements by applying design criteria for various arrangements using various sprinklers.
14. Discuss the definitions and rules specific to the storage of Roll Paper.
15. Apply the various design rules to examples of Roll Paper storage arrangements by applying design criteria for various arrangements using various sprinklers.
16. Discuss the definitions and rules specific to the storage of Baled Cotton.
17. Apply the various design rules to examples of Baled Cotton storage arrangements by applying design criteria for various arrangements,
18. Discuss the specific rules for various Special Storage arrangements, such as Plastic Motor Vehicle components and various Retail Stores.
19. Describe and discuss various options for providing protection schemes for storage arrangements.
20. Use the storage reference sheets to apply specific design criteria to various storage arrangements of various commodities stored in various arrangements.

**Seminar Format(s):** Lecture, Discussion, Video, Group & Individual Activities

**Participant materials:** NFPA 13, NFSA Storage Reference sheets, Calculator, Participant Guide

**Seminar Schedule:**

**Day 1:**

Module 1- Commodity Classification 8:00-10:30 (with break)

Module 2- Definitions & Rules for all storage 10:30-12:00

Lunch 12:00-1:00

Module 3- Definitions & Rules for Miscellaneous Storage 1:00-2:30

Break 2:30-2:45

Module 4- Definitions & Rules for General Storage 2:45-4:00
Day 2:

Module 5- Definitions & Rules for Rack Storage  8:00-12:00 (with break)
Lunch  12:00-1:00
Module 6- Definitions & Rules for Rubber Tire Storage  1:00-2:30 (with break)
Module 7- Definitions & Rules for Roll Paper Storage  2:30-3:00
Module 8- Definitions & Rules for Baled Cotton Storage  3:00-3:30
Module 8- Special Storage Designs  3:30-4:00

Review and Course Assessment

Title: Module 1- Commodity Classification

At the conclusion of this module, the participant will be able to:

1. Explain the various differences among the classes of commodities.
2. Identify the benchmarks for classifying commodities
3. Identify various types of commodities and their respective classifications.
4. Discuss the role played by the Owner’s Certificate in determining classification
5. Identify the method used to determine classifications through testing
6. Identify and discuss the various methods of treating mixed commodities
7. Discuss the various types of pallets and how they affect commodity classification
8. Discuss how changes in commodity classification can affect the owner’s responsibilities under NFPA 25
9. Use the standard to identify various commodities through a quiz

Title: Module 2- Definitions & Rules for all Storage

At the conclusion of this module, the participant will be able to:

1. Discuss the various rules that apply to all storage configurations
2. Describe the difference between and the effect encapsulation or banding has on a commodity
3. Discuss the various types of pallets, how to distinguish them apart and how to apply
interpret their effect on a commodity
4. Discuss various means of dealing with the restrictions placed upon buildings with high
clearances
5. Describe what sprinklers may be used for the protection of storage, particularly
interpreting the limitations on standard spray sprinklers
6. List the various options for protecting idle pallets, and identify the differences in
protecting wood verses plastic pallets

Title: Module 3- Definitions & Rules for Miscellaneous Storage

At the conclusion of this module, the participant will be able to:

1. Repeat the definitions for miscellaneous storage and how to compare and contrast its
protection compared to that of a storage facility
2. List examples of miscellaneous storage and explain its importance to an occupancy
3. Evaluate various options for protecting several examples of miscellaneous storage, and
propose a protection solution for each
4. Use the NFSA storage reference sheets to enhance the ability for applying the various
options allowed by the standard to calculate protection criteria for various commodities in
various arrangements using various sprinklers

Title: Module 4- Definitions & Rules for General Storage

At the conclusion of this module, the participant will be able to:

1. Discuss the rules specific to the storage of commodities that are sold piled, in bin boxes,
on shelves, on back-to-back shelves, or palletized
2. Contrast the difference, from a fire protection standpoint, between stable verses unstable
piles, and open verses closed arrays,
3. Explain the definitions of all of the above
4. Apply the various curves, adjustments, and Tables to the general storage of Class I-IV
commodities to develop protection solutions for a number of examples using various
types of sprinklers for various arrangements
5. Use the NFSA storage reference sheets to enhance the ability for applying the various
options allowed by the standard to calculate protection criteria for various commodities in
various arrangements using various sprinklers
6. Compare how the rules of rack storage may be applied to the general storage of plastics
in some circumstances
7. Describe how to use the decision tree and various Tables to calculate protection criteria
for plastics
8. Explain how to interpolate between various options

**Title- Module 5- Definitions & Rules for Rack Storage**

At the conclusion of this module, the participant will be able to:

1. Discuss the rules specific to the storage of commodities that are on racks
2. Explain the difference among single row, double row & multi row racks
3. Explain how to treat portable racks describe the differences among open, partially open & solid shelving and how each is treated regarding in rack sprinklers
4. Recognize the difference between shelves and barriers
5. Recognize the two basic rules for aisle width
6. Contrast the differences between longitudinal and transverse flu spaces
7. Discuss the basic rules of in rack sprinklers
8. Use the NFSA storage reference sheets to enhance the ability for applying the various options allowed by the standard to calculate protection criteria for various commodities in various arrangements using various sprinklers for storage arrangements in Class I-IV commodities up to and including 25’ in height, and for the same commodities stored over 25’ high.
9. Use the NFSA storage reference sheets to enhance the ability for applying the various options allowed by the standard to calculate protection criteria for various commodities in various arrangements using various sprinklers for storage arrangements in Group A plastics up to and including 25’ in height, and for the same commodities stored over 25’ high.
10. Develop optional protection schemes for examples of each of the above referenced commodities
11. Construct a rack storage arrangement utilizing in rack sprinklers to demonstrate how the standard arranges the in racks to be staggered both horizontally and vertically
12. Calculate various optional protection schemes for each of the above listed arrangements

**Title- Module 6- Definitions & Rules for Rubber Tire Storage**

At the conclusion of this module, the participant will be able to:

1. Explain the various methods for the storage of rubber tires
2. Describe why various storage arrangements are more difficult to protect than others
3. Employ the Tables in the chapter to apply various protection schemes to various arrangements and heights of storage
4. Explain the purpose and operation of double design concepts
5. Contrast various design options to compare those using verses those not using in rack sprinklers
6. Calculate various design protection criteria for various arrangements and various heights using various sprinklers

Title- Module 7- Definitions & Rules for Roll Paper Storage

At the conclusion of this module, the participant will be able to:

1. Explain the various methods for the storage of roll paper
2. Describe why various storage arrangements and various types of roll paper are more difficult to protect than others
3. Explain how to change the classification of roll paper by wrapping
4. Employ the Tables in the chapter to apply various protection schemes to various arrangements and heights of storage
5. Calculate various design protection criteria for various arrangements and various heights using various sprinklers

Title- Module 8- Definitions & Rules for Baled Cotton Storage

At the conclusion of this module, the participant will be able to:

1. Explain the various methods for the storage of baled cotton
2. Describe why various storage arrangements of baled cotton are more difficult to protect than others
3. Employ the Tables in the chapter to apply various protection schemes to various arrangements and heights of storage
4. Explain why the protection solutions for baled cotton are fairly limited in scope
5. Calculate various design protection criteria for various arrangements and various heights

Title- Module 9- Definitions & Rules for Special Design Arrangements

At the conclusion of this module, the participant will be able to:

1. Explain the Table used for protection of plastic motor vehicle parts with ESFR sprinklers
2. Discuss the various options available for protecting various identifiable retail stores using very prescriptive protection schemes with very prescriptive sprinklers
3. Discuss the definitions and rules that specifically apply to the storage of compact record storage
4. Discuss the definitions and rules that specifically apply to the storage of both mobile and fixed high bay record storage