Fighting Fire in Sprinklered Buildings Using Modules in the Classroom

RESILIENCE IS A CHOICE.

Using the Fighting Fire in Sprinklered Buildings Program in the Classroom

While the FM Global *Fighting Fire in Sprinklered Buildings* program is designed for online delivery to individuals there are circumstances where jurisdictions may elect to deliver the program in a classroom setting with multiple participants. This guide will provide the instructor with materials to assist in the customization of the program for use in the classroom.

The four modules that make up the online FFSB program are:

Automatic Sprinkler System Design and Function

Firefighters must understand how sprinkler systems work to pre-plan fire response and to use sprinklers effectively during a fire incident. This self-paced program demonstrates the advantages of automatic sprinkler systems, then describes how they work and what components they contain.

Why Sprinklered Buildings Burn

Sprinklered buildings sometimes still burn for many reasons, including design deficiencies and impairment to the sprinkler system that occurs either prior to or during the fire. In this self-paced program, you will learn why sprinklered buildings burn and how these causes can be mitigated.

Developing a Pre-Incident Plan for a Protected Building

Pre-incident planning improves sprinkler activation alarm call response. This is especially true for commercial and industrial structures because they often contain specialized equipment, warehoused goods, unusual or complicated floor plans, atypical contents, and unfamiliar fuel load configurations. Pre-incident planning allows the department to assess a structure's fire suppression systems, use, occupancy, contents, occupancy, water sources, hazards, obstructions, and other important factors that impact fire suppression efforts. This effort is extremely important because fire officers and crews see relatively fewer callouts to commercial and industrial properties compared to residential properties. Pre-incident planning also helps the department establish a relationship with the building's owner, tenants, and facilities manager. In this self-paced program, you will learn how to complete a pre-incident plan. Doing pre-incident plans for all sprinklered properties in your first due areas is an important component of being prepared and rendering professional service to your community.

Engine Company Operations at Fires in Sprinklered Properties

The initial decisions the fire officer makes and the actions of the crew he/she directs profoundly affect everything that happens later and often determine the outcome of the call. Fire officers and firefighters must know how to interact with automatic sprinkler systems properly and employ their inherent fire suppressive function to save lives and protect property. This self-paced program describes the key initial actions the fire crew arriving at a property with an automatic sprinkler system activation must take to assess the situation, control the operation of the sprinkler system, and departing the scene confident that the building owner can oversee the system's return to service.

Room Set-up and Equipment

The room used for the program should be large enough to accommodate the anticipated number of participants at tables with space to allow small group work for assigned activities. As the program is on-line, the room must have internet access and the capability to display the programs and associated PDF files on a projection screen or large video display.

Access and Documentation of Participation

Access to the FM Global *Fighting Fire in Sprinklered Buildings* program is made available to users at www.fmglobalfireserviceresources.com. Once the instructor completes the registration process they will have unlimited access to the program materials and resources. To access the programs for a class presentation, the instructor would sign into the network using their unique e-mail and password. Once signed in, the instructor can view the four programs and the materials included under the **MENU** tab of each program.

For group programs, the instructor can opt to activate the **Instructor Mode**. When activated, the Instructor Mode allows the instructor to freely move about the program to deliver the programs to students in a classroom setting. Additionally, the Instructor Mode allows the instructor to upload class lists that will allow students to register on the network. Once registered, the students can then go to the site and take the Skills Challenge for the modules presented without watching the entire module on-line. When the Skills Challenge is completed, the student may download a Certificate of Completion and access their transcript. Directions for activating and using the Instructor Mode are accessed by selecting **PROGRAM RESOURCES** under the **TRAINING** tab.

Instructor Resources

The following materials to assist the instructor are available under the RESOURCES tab:

- *Pocket Guide to Automatic Sprinklers*
- *Pocket Guide to Inspecting, Testing and Maintaining Fire Protection Equipment*
- *Pocket Guide to Pre-Incident Planning*
- *FM Global Property Loss Data Sheet 10-1 Pre-Incident and Emergency Response Planning*
- Pre-Incident Planning Activity *Instructor Guide*
- Pre-Incident Planning Activity Presentation

Student Handouts

- *Pocket Guide to Automatic Sprinklers*
- *Pocket Guide to Pre-Incident Planning*
- Pre-Incident Planning Activity *Student Guide*

Printed copies of the FM Global materials may be ordered from FM Global at www.fmglobalcatalog.com. These materials are provided at no cost to the fire service.

Program Topics and Suggested Timing

Topic	Time
Automatic Sprinkler System Design and Function	60 min
Why Sprinklered Buildings Burn	30 min
Optional Activity - System walk through	60 min
Developing a Pre-Incident Plan for a Protected Building	30 min
Pre-incident Plan Activity	60 min
Engine Company Operations at Fires in Sprinklered Properties	60 min
Optional Activity – Develop a pre-incident plan for an existing building	120 min

As a classroom presentation, the program could be delivered in a single session or a series of shorter sessions over a period of time. The times allocated for the individual topics include the actual time of the on-line program with additional time provided to the instructor to include additional information specific to the jurisdiction and class discussion and questions. The two optional activities are included to provide site visits to enhance the program.

Lesson Notes: Automatic Sprinkler System Design and Function

Learning Objectives

At the completion of this program, the learner will be able to:

1. Explain the role of sprinklers in controlling and suppressing fire
2. Explain the role of sprinklers in improving fire response from the department
3. Describe the types of sprinkler systems
4. Describe the design of a typical automatic sprinkler system and what each major component does

Discussion Questions (based on the Knowledge Check for the program)

1. How do automatic sprinklers control and contain fire?
   (Cooling hot gases, Cooling burning surfaces. Suppressing flame height.)

2. According to FM Global fires are typically controlled by the activation of how many sprinklers?
   (9 or fewer sprinklers.)

3. What factors are used to determine the temperature rating and volume of water flowed by a sprinkle?
   (Contents within the structure.)

4. Which of the following impact the ability of a sprinkler system to control a fire?
   (System not designed for the specific occupancy, Closed valves, Not enough water available)

5. The color of the liquid in a glass bulb sprinkler tells you what?
   (The temperature rating of the sprinkler.)

- Review the time temperature information for sprinklered v. no-sprinklered properties discussed in the program and how this relates to department response times and suppression operations.
- Point out that there is a chart on page 19 of the *Pocket Guide to Automatic Sprinklers* that details the temperature rating and color coding of sprinklers.
- Discuss the terminology used related to fire pump and booster pump in the program. Fire pump is used to describe a pump that provides water to a sprinkler system from a tank or static source. A booster pump is a fire pump that provides additional pressure to the system connected to a public water main.
- Review the location and type of any special systems provided within the jurisdiction.

Lesson Notes: Why Sprinklered Buildings Burn

Learning Objectives

At the completion of this module, the learner will be able to:

1. List the three main reasons that sprinklered buildings burn
2. List the most common design deficiencies and how they can affect the performance of the sprinkler system in the event of a fire
3. Explain the most common system impairments that occur before a fire and can compromise the effectiveness of a sprinkler system

Discussion Questions

1. Can a change in the type and arrangement of a buildings contents can impact a sprinkler systems ability to control a fire?
   (Yes)
2. To remain fully functional, automatic sprinkler systems require?
   (periodic maintenance)
3. What is the typical cause of sprinkler pipe obstructions such as rocks and debris?
   (Repair and replacement of underground mains.)
4. May used sprinklers be installed to replace sprinklers that have activated?
   (NO)
5. Give an example of how an arsonist may attempt to overtax a sprinkler system.
   (Setting multiple fires.)

- Review the three major reasons sprinklers buildings burn – Design deficiencies, impairments before the fire and impairments during the fire – and discuss how the fire department can identify potential issues before the fire and what can be done to prevent issues during a fire. Points to cover include engine companies observing and reporting changes in occupancy, observing closed valves during sites visits or while on calls at a facility, and monitoring sprinkler control valves and fire pumps during incidents.

Optional Activity – System Walk Through

Purpose: To provide an opportunity for students to observe typical sprinkler system components and trim in a typical setting.

Objective: Identify and describe the operation of each of the major components of the system.

Location: The ideal location for this activity would have several systems including both wet and dry that students could observe.

Time: Approx. 60 minutes

Procedure:

Break into company sized groups and walk through the building:

1. Locate the sprinkler system control valves, FDC, main drain discharge point and any sectional valves provided.
2. Observe the type and distribution of sprinklers in the protected spaces.
3. Discuss the system and inspection, testing and maintenance procedures with building personnel.

The instructor should identify locations that will provide the best learning experience for the group. As noted the optimal locations would have multiple systems with both wet and dry systems. Depending on the group size multiple instructors may be required t guide the groups. This is not intended to be a pre-plan activity but rather an opportunity for the students to become familiar with the typical system components and how they are arranged. If a facility with both system types is not available two locations could be used so that the students get the opportunity to observe the differences between wet and dry systems.

Lesson Notes: Developing a Pre-Incident Plan for a Protected Building

Learning Objectives

At the completion of this module, the learner will be able to:

1. Explain why pre-incident planning is important
2. Articulate the objectives of the familiarity visit
3. Complete a pre-incident plan
4. Explain when the pre-plan should be updated

Discussion Questions after watching the program

1. In addition to being used during a response to an incident, what other use could a pre-incident plan for a building have?
   (Training)
2. Is a property survey necessary to develop a good pre-incident plan?
   (Yes)
3. When arranging a property survey for a pre-incident plan you should stress that:
   (the visit is informational and not a code compliance visit.)
   The instructor should review the jurisdictions policy and procedures for how potential code violations observed during a pre-incident plan visit should be addressed.
4. Changes in the occupancy or operations noted since the last visit are be an indicator of what?
   A. (Potential deficiencies in sprinkler design compared to the original configuration.)

- Discuss the policies and procedures of the jurisdiction for pre-incident planning. If the jurisdiction uses a data collection form review it with the group.
- Discuss what type of plans/sketches would be used for the pre-incident plan and where they would be obtained
- Break the group into company sized teams and complete the Pre-incident Planning Activity. (See Instructor Guide in RESOURCES section for specific information and resource materials)

Lesson Notes: Engine Company Operations at Fires in Sprinklered Properties

Learning Objectives

At the completion of this module, the learner will be able to:

1. Preform a size-up of a structure provided with an automatic sprinkler system.
2. Interpret the information obtained during the size-up to determine the reason for a sprinkler system activation.
3. Develop an initial incident action plan using size-up and pre-incident plan information.
4. Deploy available resources to implement action plan.
5. Monitor conditions as operations progress. (Decision making)
6. Coordinate with building management to restore all fire protection systems to the building.

Discussion Questions

1. Protecting property from fire loss serves the interests of both the property owner and the community.
   (TRUE)
2. What is the first thing the officer responding to an alarm should accomplish on arrival?
   (A visual inspection for signs of fire.)
3. One of the first priorities on arrival at an alarm in a sprinklered property is to assign a firefighter to locate and monitor the sprinkler control valve.
   (TRUE)
4. What assignments are typically given by the first arriving officer at an incident involving a sprinklered property?
   (Hooking up to the FDC, monitoring the fire alarm panel. locating the cause of the alarm and fire attack)

- Discuss the various scenarios presented in the program and how the pre-incident plan would be used to support the tactical decisions made by the company officer for each.
- How are pre-incident plans used by the jurisdiction?

Optional Activity – Develop a Pre-incident Plan for an Existing Building

Purpose: To apply the skills and knowledge gained in the class to an actual pre-incident planning exercise for an existing building

Objectives:

1. Conduct a site visit at an existing building to gather data for use in developing a pre-incident plan.
2. Develop a pre-incident plan for an assigned building utilizing data gathered during site visit so that critical systems are identified and documented and assignments for first alarm companies are identified.
3. Given a scenario develop a tactical plan using the pre-incident plan for guidance.

Materials Building plan/sketch, pre-incident planning checklist, Pre-incident plan worksheet

Location: An existing facility provided with one or more automatic sprinkler system.

Time: Approx. 120 minutes

Procedure:

As a company complete the following:

1. Survey the building and complete the pre-incident plan checklist
2. Use the data from the site visit (checklist) to develop a pre-incident plan for the building.
3. Develop a response for each assigned scenario using the information included in the pre-incident plan.
4. Compare the plan developed in this exercise with any existing plans for the building.