



FEMA



National Fire Academy

**R0227 – Fire Protection Systems for Emergency Operations
Version: 3rd Edition, 8th Printing, January 2014**

Quarter:

ACE Credit: In the lower division baccalaureate/associate degree category, two semester hours in fire science or fire engineering.

IACET Continuing Education Units: 5.1

Length of Course: 6 Days (52 contact hours, Sunday – Friday)

Prerequisite: Yes

Curriculum: Incident Management

Training Specialist: Woody Stratton

Instructor:

Instructor email/phone:

Classroom: J-

Meeting Time: 8 AM – 5 PM

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Course Description (Catalog)

R0227 – “Fire Protection Systems for Emergency Operations.” This six-day course is designed to provide Incident Commanders (ICs) with an understanding of the fire protection features installed in buildings. Knowing how these systems work and their proper use will assist ICs in achieving strategic and tactical success. The course will emphasize the value of collecting this information during preincident planning and how to relay this knowledge to other firefighters who must respond and function effectively using these systems under emergency conditions.

Topics addressed include developing model preincident plans; the importance of collecting and sharing information with other emergency responders; and understanding the fundamental operations, strengths and limitations of built-in fire protection systems including automatic

sprinklers, standpipes, fire pumps, fire detection and alarm systems, smoke management systems, and special hazard fire protection equipment.

Student Qualifications (Primary and Secondary Audience)

Anyone responsible for the command and control of incident operations, preferably in the built environment. Target audience includes command officers, COs, fire department training officers, and those acting in that capacity. Additional target audience is those officers who are upwardly mobile in their organizations and will or may be in command positions in the near future.

Course Scope (Goal)

Incident Commanders (IC's) will recognize the need for fire protection systems and the importance of relying on them to provide specific fire protection.

Course Objectives (Course Learning Outcomes – TLOs)

After successfully completing this course, you will be able to accomplish the following:

- Describe the course goals and the rationale for the training.
- Recognize the value to the Incident Commander (IC) of prior knowledge of the fire protection systems in a building.
- Recognize the importance of preincident planning in making appropriate decisions in specific emergency situations.
- Describe the benefits of preincident planning and the relationship between these activities and the effective use of fire protection systems.
- Identify the value and performance capabilities of many of the passive fire protection features installed in buildings and facilities.
- Describe the role of fire alarm systems in life safety, fire protection, and fire control.
- Describe the strategic and tactical roles of water-based systems in fire control and suppression.
- Identify the types of smoke management systems, their locations in buildings, how they operate, and their roles in strategic and tactical efforts.
- Recognize the role of specialty systems in fire protection.
- Explain how the systems described in previous units are integrated into interdependent systems.

Course Delivery Method

The National Fire Academy (NFA) offers specialized training courses and advanced management programs of national impact in an academic classroom environment [on campus at the National Emergency Training Center \(NETC\) in Emmitsburg, Maryland.](#) This classroom course is designed for the national level fire service officer from State and local fire service organizations. During this 6-day delivery, students will reside in dormitories provided on campus with classes conducted in classrooms designed for critical student/instructor interaction. All course materials are designed for interactive classroom environments, in either paper notebook or electronic formats.

Course Schedule

The purpose of the course schedule is to give you, at a glance, the required preparation, activities, and evaluation components of your course.

	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6
AM	Unit 0: Introduction Unit 1: Purpose of Fire Protection Systems	Unit 4: Passive Fire Protection Features	Unit 5: Fire Alarm Systems (cont'd) Unit 6: Water-Based Fire Protection Systems	Unit 6: Water-Based Fire Protection Systems (cont'd)	Unit 7: Smoke Management Systems (cont'd)	Demo: Smoke model/ Specialty systems (R Building) Final Exam Unit 10: Final Project Presentations
PM	Unit 2: Decisionmaking Unit 3: Preincident Planning Benefits	Unit 4: Passive Fire Protection Features (cont'd) Unit 5: Fire Alarm Systems	Unit 6: Water-Based Fire Protection Systems (cont'd) Target Hazard for final project due from all groups.	Unit 6: Water-Based Fire Protection Systems (cont'd) Unit 7: Smoke Management Systems	Unit 8: Specialty Systems Unit 9: Integrated Systems and Performance	Unit 10: Final Project Presentations Graduation
NETC IN-RESIDENCE DEMOS (1830 in R Bldg.)		Fire Alarm and Detection Systems	Sprinkler Systems	Standpipe/ Fire Pump/ Live Fire		
READING	Units 4 and 5 in the Student Manual	Unit 6 in the Student Manual	Unit 7 in the Student Manual	Units 8 and 9 in the Student Manual		

Course Resources (Instructional Materials)

In order to be fully prepared, obtain a copy of the required textbooks and other instructional materials prior to the first day of class.

Required Readings

The student must complete required readings during the course to be able to thoughtfully participate in discussions and activities.

None.

Suggested Reading/Resources

Suggested readings and resources are not evaluated, but may enhance the student's understanding, serve as additional sources for citation and promote discussion of course material.

“Performance Keys to Successful Fire Outcomes”

“Fire Department Operations at Sprinklered Properties”

“How Reliable are Private Fire Hydrants?”

Required Resources (Course Textbook)

Student Manual.

Supplemental Resources (Supplemental Course Textbook)

None.

Grading Methodology (Evaluation Procedures)

Group Final Project

The presentations required at the conclusion of the course are scored as follows:

1. The format and content of the presentation includes all of the elements listed in the objectives for the assignment in accordance with the learning outcomes.
2. The presentation time is a minimum of 20 minutes but no more than 30 minutes. Each member of the group must participate in development and presentation of the project.
3. Instructors will document the evaluation of students' presentations on the Group Presentation Rubric. Any corrective and/or diagnostic comments about the students' plans should also be written on the form.
4. Instructors will record the appropriate grade for each student on Master Grade Sheet.

5. Instructors will share grade sheets, including any comments/recommendations with the student after completion of the presentation and grading.
6. The Group Project will constitute 30 percent of final grade for each student.

Final Exam

Each student will be given an exam consisting of 50 multiple-choice questions. The exam will constitute 50 percent of the final grade.

Final Course Grade

- attendance = 10 percent;
- student activities = 10 percent;
- final group project = 30 percent; and
- final exam = 50 percent.

Letter Grade	Point Range	Student Performance Criteria
A	100-90	<ul style="list-style-type: none"> • Demonstrates ability to interpret, integrate, and apply learning outcomes beyond the context of the course through application of critical and creative thinking skills. • Completes work assignments that consistently exceed requirements and that interprets and applies objectives in new, unique, or creative ways.
B	89-80	<ul style="list-style-type: none"> • Completes work assignments that consistently meet most requirements. • Contributes regularly to class participation activities.
C	79-70	<ul style="list-style-type: none"> • Demonstrates a satisfactory level of competence in learning outcomes for the course. • Completes work assignments that satisfy minimum requirements for the course. • Satisfies minimum requirements for class participation activities.
F	69 and below	<ul style="list-style-type: none"> • Cannot demonstrate competence in many fundamental outcomes for the course. • Submits work assignments that frequently do not meet minimum requirements, or do not complete the assigned work. • Does not satisfy minimum requirements for attendance or contribution to class activities.
I	—	<ul style="list-style-type: none"> • Satisfactorily completed most of the required work for the course, but due to medical reasons or other extenuating circumstances, is unable to complete the work by the end of the next semester. • Fails to request a deadline extension from the Training Specialist.

Required Reading Assignments

Student completion of reading assignments will be done via evaluation of their class participation and will not be a separately graded activity.

Suggested Readings

Suggested readings are not evaluated, but may enhance the student's understanding and promote discussion of course material.

Course Outline

Unit 0: Introduction (Day 1)

Objectives

Terminal Objective

Given an overview of the course agenda and requirements, the students will be able to describe the course goals and the rationale for the training.

Enabling Objectives

The students will:

1. List and share their biographical information, including their experience with fire protection systems and preincident planning.
2. List and share their expectations for the course.

Unit 1: Purpose of Fire Protection Systems (Day 1)

Objectives

Terminal Objective

The students will be able to recognize the value to the Incident Commander (IC) of prior knowledge of the fire protection systems in a building.

Enabling Objectives

The students will:

1. Identify components of common fire protection systems.

2. Identify 10 reasons for the use of fire protection systems.
3. List "indirect costs" that may result from a lawsuit against the fire department.

Unit 2: Decisionmaking (Day 1)

Objectives

Terminal Objective

The students will be able to recognize the importance of preincident planning in making appropriate decisions in specific emergency situations.

Enabling Objectives

The students will:

1. Distinguish between classical and naturalistic decisionmaking.
2. Determine when to use each approach.

Unit 3: Preincident Planning Benefits (Day 1)

Objectives

Terminal Objective

The students will be able to describe the benefits of preincident planning and the relationship between these activities and the effective use of fire protection systems.

Enabling Objectives

The students will:

1. Describe the key factors evaluated in a preincident plan.
2. Describe how preincident plans are used before, during, and after a fire.
3. Identify a list of information sources for completing preincident plans.

Unit 4: Passive Fire Protection Features (Day 2)

Objectives

Terminal Objective

The students will be able to identify the value and performance capabilities of many of the passive fire protection features installed in buildings and facilities.

Enabling Objectives

The students will identify the types of protection provided by:

1. Property line setbacks.
2. Firewalls.
3. Rated assemblies.
4. Fire-resistive materials.

Unit 5: Fire Alarm Systems (Day 2)

Objectives

Terminal Objective

The students will be able to describe the role of fire alarm systems in life safety, fire protection, and fire control.

Enabling Objectives

The students will:

1. Identify the types of alarm systems and their locations.
2. Explain how each type of alarm system works.
3. Recognize the types of impairments that can affect the effectiveness of fire alarm systems.
4. Describe strategies and tactics related to the effective use of fire alarm systems.

Unit 6: Water-Based Fire Protection Systems (Day 3)

Objectives

Terminal Objective

The students will be able to describe the strategic and tactical roles of water-based systems in fire control and suppression.

Enabling Objectives

The students will:

1. Describe the role of sprinklers in fire protection.
2. Describe the role of standpipe systems in fire protection.
3. Describe the role of fire pumps in fire protection.

Unit 7: Smoke Management Systems (Day 4)

Objectives

Terminal Objective

The students will be able to identify the types of smoke management systems, their locations in buildings, how they operate, and their roles in strategic and tactical efforts.

Enabling Objectives

The students will:

1. Identify the types of smoke management features and their locations in buildings.
2. Describe the operation of each type of smoke management feature or system.
3. Recognize the need to incorporate smoke management systems into preincident plans.

Unit 8: Specialty Systems (Day 5)

Objectives

Terminal Objective

The students will be able to recognize the role of specialty systems in fire protection.

Enabling Objectives

The students will:

1. Identify five types of specialty fire protection systems.
2. Describe where they are likely to be found and how to operate them.
3. Describe the types of impairments to the systems that may impede their effectiveness.

Unit 9: Integrated Systems and Performance (Day 5)

Objectives

Terminal Objective

The students will be able to explain how the systems described in previous units are integrated into interdependent systems.

Enabling Objectives

The students will:

1. Define integrated systems.
2. Describe the inputs and outputs of fire control system components and their activation sequence.
3. Describe how knowledge and use of fire protection systems relate to Homeland Security National Preparedness goals.

Unit 10: Final Project (Day 6)

Objective

The students, in groups, will be able to develop and present a simulated training exercise on infrastructure protection intelligence collection.

Policies

Class Attendance and Cancellation Policy

Attendance

- You are required to attend all sessions of the course. If you do not, you may not receive a certificate, and your stipend may be denied.
- If you need to depart campus early and miss any portion of the course and/or graduation, you must make the request in writing to the NFA training specialist. The training specialist, in collaboration with the superintendent, may waive the attendance requirement in order to accommodate you with extraordinary circumstances as long as you complete all course requirements. If you receive approval for departing early, you must forward the approval to the Admissions Office so your stipend reimbursement is not limited.

Student Substitutions

Substitutions for NFA courses are made from waiting lists; your fire department can't send someone in your place.

Cancellations or No-Shows

NFA's mission for delivery of courses is impaired significantly by cancellations and no-shows. It is very difficult and costly to recruit students at the last minute. Currently there is a two-year ban on student attendance for students who are no-shows or cancel within 30 days of the course start date without a valid reason. If you receive such a restriction, your supervisor needs to send a letter to our Admissions Office explaining the cancellation/no-show.

Course Failure

If you fail an on-campus course, you will not be issued a stipend for that course. You can reapply for the failed course or any other NFA course and go through the random selection process. You don't have to successfully complete the failed course before attending another NFA course.

Student Code of Conduct Policy

Students, instructors and staff are expected to treat each other with respect at all times. Inappropriate behavior will not be tolerated and may result in removal from campus and denial of stipends.

Writing Expectations

Student writing will conform to the generally accepted academic standards for college papers. Papers will reflect the original work of the student and give appropriate credit through citations for ideas belonging to other authors, publications or organizations. Student written work should be free of grammatical and syntax errors, free of profanity or obscene language or ideas, and reflect critical thinking related to the course subject matter.

Citation and Reference Style

Attention Please: Students will follow the APA, Sixth Edition as the sole citation and reference style used in written work submitted as part of coursework to NFA. Assignments completed in a narrative essay, composition format, abstract, and discussion posts must follow the citation style cited in the APA, Sixth Edition.

Late Assignments

Students are expected to submit classroom assignments by the posted due date (11:59 p.m. EDT/EST) and to complete the course according to the published class schedule. As adults, students, and working professionals, you must manage competing demands on your time. Discussion board postings submitted within 3 days after the submission deadline will receive up to a 20% deduction. Those that do not submit their discussion board postings within this timeline will receive a “0” grade for the week. Final assignment papers will not be accepted after the deadline. Any paper submitted after the deadline will receive a “0” grade for that assignment.

Netiquette

Online learning promotes the advancement of knowledge through positive and constructive debate – both inside and outside the classroom. Forums on the Internet, however, can occasionally degenerate into needless insults and “flaming.” Such activity and the loss of good manners are not acceptable in a professional learning setting – basic academic rules of good behavior and proper “Netiquette” must persist. Remember that you are in a place for the rewards and excitement of learning which does not include descent to personal attacks or student attempts to stifle the forum of others.

- **Technology Limitations.** While you should feel free to explore the full-range of creative composition in your formal papers, keep e-mail layouts simple. The NFA Online classroom may not fully support MIME or HTML encoded messages, which means that bold face, italics, underlining, and a variety of color-coding or other visual effects will not translate in your e-mail messages.

- Humor Note. Despite the best of intentions, jokes and especially satire can easily get lost or taken seriously. If you feel the need for humor, you may wish to add “emoticons” to help alert your readers: ;-), :), ☺ .

Disclaimer Statement

Course content may vary from the outline to meet the needs of this particular group.

Grading

Please review the following rubrics that explain how grades will be awarded.

Students who do not complete the entire course will be awarded an Incomplete (I) grade. In accordance with National Fire Academy academic policies, an Incomplete (I) grade must be removed by the end of the next semester following the course, or it automatically becomes a Failing (F) grade.

If you fail an on-campus course, you will not be issued a stipend for that course. You can reapply for the failed course or any other NFA course and go through the random selection process. You don't have to successfully complete the failed course before attending another NFA course.

http://www.usfa.fema.gov/training/nfa/admissions/student_policies_campus_information.html

Academic Honesty

Students are expected to exhibit exemplary ethical behavior and conduct as part of the NFA community and society as a whole. Acts of academic dishonesty including cheating, plagiarism, deliberate falsification, and other unethical behaviors will not be tolerated.

Students are expected to report academic misconduct when they witness a violation. All cases of academic misconduct shall be reported by the instructor to the Training Specialist.

If a student is found to have engaged in misconduct and the allegations are upheld, the penalties may include, but are not limited to one or a combination of the following:

- expulsion,
- withholding of stipend or forfeiture of stipend paid,
- exclusion from future classes for a specified period; depending on the severity it could range from 1-10 years, and/or
- forfeiture of certificate for course(s) enrolled in at NETC.

Refer to NFA-specific Standard Operating Procedure 700.1 – *Academic Code of Conduct and Ethics* for more information.

Grading Rubrics

ATTACHMENT 3

GROUP PRESENTATION RUBRIC

CATEGORY	4	3	2	1	Score
Preparedness	Student is completely prepared and has obviously rehearsed.	Student seems pretty prepared but might have needed a couple more rehearsals.	The student is somewhat prepared, but it is clear that rehearsal was lacking.	Student does not seem at all prepared to present.	
Comprehension	Student is able to accurately answer almost all questions posed by classmates about the topic.	Student is able to accurately answer most questions posed by classmates about the topic.	Student is able to accurately answer a few questions posed by classmates about the topic.	Student is unable to accurately answer questions posed by classmate about the topic.	
Content	Shows a full understanding of the topic.	Shows a good understanding of the topic.	Shows a good understanding of parts of the topic.	Does not seem to understand the topic very well.	
Posture and Eye Contact	Stands up straight, looks relaxed and confident. Establishes eye contact with everyone in the room during the presentation.	Stands up straight and established eye contact with everyone in the room during the presentation.	Sometimes stands up straight and established eye contact.	Slouches and/or does not look at people during the presentation.	
Collaboration with Peers	Almost always listens to, shares with, and supports the efforts of others in the group. Tries to keep people working well together.	Usually listens to, shares with, and supports the efforts of others in the group. Does not cause "waves" in the group.	Often listens to, shares with, and supports the efforts of others in the group but sometimes is not a good team member.	Rarely listens to, shares with, and supports the efforts of others in the group. Often is not a good team member.	
Volume	Volume is loud enough to be heard by all audience members throughout the presentation.	Volume is loud enough to be heard by all audience members at least 90% of the time.	Volume is loud enough to be heard by all audience members at least 80% of the time.	Volume often too soft to be heard by all audience members.	
Stays on Topic	Stays on topic all (100%) of the time.	Stays on topic most (99-90%) of the time.	Stays on topic some (89%-75%) of the time.	It was hard to tell what the topic was.	

Total: _____