Hazards and Special Operations Plan Review (2024)

Course Plan

Course Details

Certification: Fire Plans Examiner

CTS Guide: Fire Plans Examiner (2024)

Description: This course provides the knowledge and skills that prepare a fire plans examiner to evaluate plans associated with design and systems integration, alternative compliance, wildland urban interface areas, and special operations including hazardous materials; equipment operations, and processes; and high-piled combustible storage.

Designed For: Personnel preparing to pursue Fire Plans Examiner certification or anyone who performs the duties of a fire plans examiner within their agency

Prerequisites: Fire Plans Examiner 1A: Building Plan Review (2024)

Standard: Complete all activities and formative tests

Complete all summative tests with a minimum score of 80%

Hours (Total): 31 hours

(22.5 lecture / 6.5 application / 2 testing)

Maximum Class Size: 30

Instructor Level: SFT Fire Plans Examiner Registered Instructor

Instructor/Student Ratio: 1:30 (lecture)

1:15 (application)

Restrictions: None

SFT Designation: CFSTES

Table of Contents

Required Resources

Instructor Resources

To teach this course, instructors need:

- California Building Code (CBC) (CCR, Title 24, current edition)
- California Fire Code (CFC) (CCR, Title 24, current edition)
- California Code of Regulations (CCR), Title 24, Part 7
- *Code Officials Guide to Performance Based Design Review* (SFPE, 2004)
- NFPA 4: Standard for Integrated Fire Protection and Life Safety System Testing (current edition)
- NFPA 13: Standard for the Installation of Sprinkler Systems (current edition)
- NFPA 550: Guide to Fire Safety Concepts Tree (current edition)
- NFPA 1030: Standard for Professional Qualifications for Fire Prevention Program Positions (current edition)
- *Plans Examiner for Fire and Emergency Services* (IFSTA, 2016)
- *WUI Virtual Handbook for Fire Risk Assessment & Mitigation* (SFPE, 2nd edition, 2025)
    - https://www.sfpe.org/wuihandbook/home
- Engineering scale
- Architectural scale
- Calculator

Online Instructor Resources

The following instructor resources are available online at https://osfm.fire.ca.gov/what-we-do/state-fire-training/professional-certifications:

- Activity 5-2: Safety Data Sheets

Student Resources

To participate in this course, students need:

- California Building Code (CCR, Title 24, current edition)
- California Fire Code (CCR, Title 24, current edition)
- NFPA 4: Standard for Integrated Fire Protection and Life Safety System Testing (current edition)
- NFPA 13: Standard for the Installation of Sprinkler Systems (current edition)
- NFPA 550: Guide to Fire Safety Concepts Tree (current edition)
- Engineering scale
- Architectural scale
- Calculator

Facilities, Equipment, and Personnel

The following facilities, equipment, or personnel are required to deliver this course:

- Standard learning environment or facility, which may include:
    - Writing board or paper easel chart
    - Markers, erasers
    - Amplification devices
    - Projector and screen
    - Laptop or tablet with presentation or other viewing software
    - Internet access with appropriate broadband capabilities
- A large room with tables to accommodate full-size plans for up to 30 students
- Two sets of plans, specifications, and details for each student or student group (At a minimum, documents should be sufficient to meet the objectives of Application activities designed by the instructor)
    - One set for course activities
    - One set for testing

Timetable

Segment	Lecture	Application	Unit Total
Unit 1: Introduction			
Topic 1-1: Orientation and Administration	0.50	0.00	
Topic 1-2: Fire Plans Examiner Certification Process	0.50	0.00	
Unit 1 Totals	**1.00**	**0.00**	**1.00**
Unit 2: Design and Systems Integration			
Topic 2-1: Evaluating Design Concepts	2.00	0.00	
Topic 2-2: Evaluating Systems Integration	1.00	1.00	
Unit 2 Totals	**3.00**	**1.00**	**4.00**
Unit 3: Alternative Compliance			
Topic 3-1: Evaluating Performance-Based Design Concepts	1.00	0.00	
Topic 3-2: Evaluating a Proposed Alternative Method or Material for Compliance	1.00	0.00	
Topic 3-3: Evaluating Compliance with Construction Documents	0.50	0.00	
Unit 3 Totals	**2.50**	**0.00**	**2.50**
Unit 4: Wildland Urban Interface Areas			
Topic 4-1: Evaluating Development/Community or Wildland Urban Interface Landscape Plans	3.00	1.00	
Unit 4 Totals	**3.00**	**1.00**	**4.00**
Unit 5: Special Operations			
Topic 5-1: Evaluating Fire Protection Plans and Practices	0.50	0.00	
Topic 5-2: Evaluating Plans for Storage, Handling, and Use of Hazardous Materials	7.00	2.00	
Topic 5-3: Evaluating Compliance Approaches for Hazardous Materials	1.50	0.00	
Topic 5-4: Evaluating Plans for Equipment, Operations, and Processes	1.00	1.00	
Topic 5-5: Evaluating Protection Measure Approaches for Equipment, Operations, and Processes	1.00	0.00	
Topic 5-5: Evaluating a Plan with Special (High-piled Combustible) Storage Arrangements	2.00	1.50	
Unit 5 Totals	**13.00**	**4.50**	**17.50**
Formative Assessments			
Determined by AHJ or educational institution	**0.00**	**0.00**	**0.00**
Summative Assessment			
Determined by AHJ or educational institution	**0.00**	**2.00**	**2.00**

Course Totals	**22.50**	**8.50**	**31.00**

Timetable Key

1. The Timetable documents the amount of time estimated to deliver the content included in the course plan.

2. Time is documented using the quarter system: 15 min. = .25 / 30 min. = .50 / 45 min. = .75 / 60 min. = 1.0.

3. The Course Totals do not reflect time for lunch (1 hour) or breaks (10 minutes per each 50 minutes of instruction or assessment). It is the instructor's responsibility to add this time based on the course delivery schedule.

4. Application (activities, skills exercises, and formative testing) time will vary depending on the number of students enrolled. The Application time documented is based on the maximum class size identified in the Course Details section.

5. Summative Assessments are determined and scheduled by the authority having jurisdiction. These are not the written or psychomotor State Fire Training certification exams. These are in-class assessments to evaluate student progress and calculate course grades.

Unit 1: Introduction

Topic 1-1: Orientation and Administration

Terminal Learning Objective

At the end of this topic, a student will be able to identify facility and classroom requirements and identify course objectives, events, requirements, assignments, activities, resources, evaluation methods, and participation requirements in the course syllabus.

Enabling Learning Objectives

1. Identify facility requirements
    - Restroom locations
    - Food locations
    - Smoking locations
    - Emergency procedures
2. Identify classroom requirements
    - Start and end times
    - Breaks
    - Electronic device policies
    - Special needs and accommodations
    - Other requirements as applicable
3. Review course syllabus
    - Course objectives
    - Calendar of events
    - Course requirements
    - Student evaluation process
    - Assignments
    - Activities
    - Required student resources
    - Class participation requirements

Discussion Questions

1. What is a formative test? What is a summative test?

Application

1. Determined by instructor

Topic 1-2: Fire Plans Examiner Certification Process

Terminal Learning Objective

At the end of this topic a student will be able to identify the requirements for Fire Plans Examiner certification and describe the certification task book and examination process.

Enabling Learning Objectives

1. Identify the levels of certification in the Fire Plans Examiner certification track
2. Identify other Fire Prevention certification tracks
   - First Responder Inspector (2024) of Fire Inspector 1 (2014)
   - Fire Inspector (2024) or Fire Inspector 2 (2014)
   - Fire Marshal (2014 or 2024)
3. Identify the prerequisites for Fire Plans Examiner certification
   - None
4. Identify the course work required for Fire Plans Examiner certification
   - Fire Plans Examiner 1A: Building Plan Review (2024)
   - Fire Plans Examiner 1B: Fire Protection and Life Safety Systems Plan Review (2024)
   - Fire Plans Examiner 1C: Hazards and Special Operations Plan Review (2024)
   - Statutes and Regulations (SFT)
5. Identify the exams requirements for Fire Plans Examiner certification
   - Not applicable
6. Identify the task book requirements for Fire Plans Examiner certification
   - Fire Plans Examiner Certification Task Book (2024)
7. Identify the experience requirements for Fire Plans Examiner certification
   - Has a minimum of one (1) year full-time paid experience or two (2) years' volunteer or part-time paid experience in a recognized California fire agency in a fire prevention role with plan review as their primary responsibility
8. Identify the position requirements for Fire Plans Examiner certification
   - None
9. Describe the certification task book process
10. Describe the certification testing process
    - Not applicable
    - All formative and summative testing is completed in individual courses
    - Schedule skills evaluation test

Discussion Questions

1. Determined by instructor

Application

1. Determined by instructor

Unit 2: Design and Systems Integration

Topic 2-1: Evaluating Design Concepts

Terminal Learning Objective

At the end of this topic a student, given a preliminary design presentation, will be able to evaluate a proposed design concept so that the proposed concept meets the intent of applicable codes and standards and is in accordance with AHJ policies and procedures.

Enabling Learning Objectives

1. Describe fire protection and life safety construction features
2. Describe codes and standards
3. Describe AHJ preliminary plan review procedures
4. Describe the approval process for alternative fire protection methodologies
5. Evaluate code compliance of conceptual designs
    - Construction
    - Exits and egress
    - Access and water supply
    - Fire protection and life safety systems

Discussion Questions

1. What other departments should a fire plans examiner consult during a design concept evaluation?
2. What are some design features or issues that could render a preliminary design unacceptable?
3. How are the design concept review and the adoption cycles for state and local codes and standards interrelated?

Application

1. Determined by instructor

Instructor Notes

1. For more information on this topic, see *Guidance Document for Incorporating Resiliency Concepts into NFPA Codes and Standards.* (Performance Technologies Inc. / www.nfpa.org)

CTS Guide Reference: CTS 3-2

Topic 2-2: Evaluating Systems Integration

Terminal Learning Objective

At the end of this topic a student, given a plan submittal, a life safety report, a sequence of operations report, and testing criteria, will be able to evaluate the integration of life safety, fire protection, security, and building service systems so that the integration of proposed systems meets the requirements or intent of applicable codes and standards and meets AHJ fire and life safety objectives, and any deficiencies are identified, documented, and reported in accordance with AHJ policies and procedures.

Enabling Learning Objectives

1. Describe AHJ fire and life safety objectives
   - Building and property protection
   - Life safety
     - Protection
     - Evacuation
   - Building protection vs. life safety
2. Describe fire protection and life safety systems and their integration
   - Construction
   - Separation
   - Egress
   - Fire protection and life safety systems
3. Evaluate system integration

Discussion Questions

1. What fire and life safety concerns apply to security systems?
2. How might the fire and life safety objectives of a fire agency differ from those of a property owner? Or the public?

Application

1. Given a high-rise plan, have students review the integrated systems to determine how the construction, fire protection and life safety, and building service systems work together to promote building and occupant survivability.

Instructor Notes

1. See NFPA 4: Standard for Integrated Fire Protection and Life Safety System Testing (current edition) for testing criteria.

CTS Guide Reference: CTS 3-14

Unit 3: Alternative Compliance

Topic 3-1: Evaluating Performance-Based Design Concepts

Terminal Learning Objective

At the end of this topic a student, given a preliminary design presentation, will be able to evaluate a performance-based design concept so that the proposed concept meets the intent of applicable codes and standards in accordance with AHJ policies and procedures.

Enabling Learning Objectives

1. Describe fire protection construction features
2. Describe codes and standards
3. Describe technical reports and data sheets associated with performance-based designs
4. Describe AHJ preliminary plan review procedures
5. Describe performance-based concepts
6. Describe the approval process for alternative performance-based fire protection methodologies
7. Describe the development of appropriate input values based on building type and anticipated hazards and use
8. Identify AHJ code requirements
9. Identify other subject matter experts who may need to evaluate components of performance-based designs
10. Recognize deviations from the prescriptive code
11. Recognize and interpret performance-based proposals
12. Research professional reports and engineer evaluations
13. Determine and present appropriate design input values and parameters based on building type and anticipated hazards and use

Discussion Questions

1. In what circumstances or building types might a fire plans examiner be more likely to encounter a performance-based design concept?
2. What other AHJ subject matter experts may need to evaluate a performance-based design?
3. Who are the stakeholders that need to be notified when a plan deviates from adopted codes and standers prior to approving performance-based designs?

Application

1. Determined by instructor

Instructor Notes

1. Bring examples of performance-based design from your jurisdiction.
2. See NFPA 550: Guide to Fire Safety Concepts Tree (current edition).
3. See *Code Officials Guide to Performance Based Design Review* (SFPE, 2004)

CTS Guide Reference: CTS 3-22

Topic 3-2: Evaluating a Proposed Alternative Method or Material for Compliance

Terminal Learning Objective

At the end of this topic a student, given supporting documentation of a design that does not meet prescriptive code requirements, will be able to evaluate a proposed alternative method or material for compliance with applicable codes and standards so that the design meets the intent of applicable codes and standards.

Enabling Learning Objectives

1. Describe how a building should perform under adverse conditions
2. Describe objectives and performance requirements to reflect equivalent level of safety
   - Per AHJ
   - Per other performance-based regulation for a process or operation
3. Evaluate alternative proposals to prescriptive codes and standards
   - Unable to meet prescriptive code, but equivalent
   - Emerging technologies not yet codified
4. Identify resources for verifying code intent
   - ICC Code and Commentary
   - ISOR (Initial Statement of Reasons) (OSFM)
   - ICC ESR (Evaluation Service Report)
   - Third-party independent peer review

Discussion Questions

1. What liabilities can be created by approving a proposed alternative method or material?
2. Under what circumstances is it appropriate for an applicant to propose an alternative method or material to achieve compliance?

Application

1. Determined by instructor

Instructor Notes

1. Bring examples of proposed alternative method or material for compliance from your jurisdiction.
2. See NFPA 550: Guide to Fire Safety Concepts Tree (current edition).
3. See *Code Officials Guide to Performance Based Design Review* (SFPE, 2004)

CTS Guide Reference: CTS 2-6

Topic 3-3: Evaluating Compliance with Construction Documents

Terminal Learning Objective

At the end of this topic a student, given a performance-based design, will be able to evaluate compliance with construction documents so that life safety systems and building services equipment are installed, inspected, and tested to perform as described in the engineering documents and the operations and maintenance manual that accompanies the design and deficiencies are identified, documented, and reported in accordance with AHJ policies and procedures.

Enabling Learning Objectives

1. Describe applicable codes and standards for installation and testing of fire protection systems
2. Describe means of egress
3. Describe building services equipment
4. Witness and document tests of fire protection systems and building services equipment
5. Evaluate means of egress
6. Evaluate building services equipment

Discussion Questions

1. How might an integrated design impact the ability to egress through corridor doors during an emergency?
2. How does the quality of plan review comments towards performance-based design help dictate the quality of the plan review resubmittal and back check?

Application

1. Determined by instructor

Instructor Notes

1. None

CTS Guide Reference: CTS 3-23

Unit 4: Wildland Urban Interface Areas

Topic 4-1: Evaluating Development/Community or Wildland Urban Interface Landscape Plans

Terminal Learning Objective

At the end of this topic a student, given a fire hazard severity zone map, a set of landscape plans for a development or community in a fire hazard severity zone, and a set of landscape plans for a wildland urban interface area, will be able to evaluate those plans so that plans are in compliance with applicable codes and standards and deficiencies are identified, documented, and reported in accordance with AHJ policies and procedures and required or applicable permits are issued.

Enabling Learning Objectives

1. Describe basic wildland fire behavior
2. Describe wildland urban interface fire progression
3. Describe fire hazard severity zone maps
   - SRA
   - LRA
4. Define wildland urban interface zones
   - Moderate fire hazard severity zone
   - High fire hazard severity zone
   - Very high fire hazard severity zone
   - Designated wildland urban interface areas
5. Describe codes and standards related to public areas of a development/community landscape plan
6. Describe codes and standards related to a wildland urban interface area landscape plan
7. Describe home ignition zones for defensible space
   - Zone 0
   - Zone 1
   - Zone 2
   - Zone 3
8. Describe the infrastructure considerations for grading and improvement plans
9. Identify and evaluate design and maintenance standards for open space areas adjacent to new development projects
10. Describe how to evaluate a vegetation management plan for buildings in a wildland urban interface area
11. Describe requirements for coordinating with applicable building and planning departments

Discussion Questions

1. At what point in a development or design process should wildland urban interface protection methods be identified?
2. What resources can a fire plans examiner use when evaluating wildland fuel hazards?
3. How would you approach a Zone 0 discussion with a registered design professional?

Application

1. Given landscape drawings for a residence in a designated fire hazard severity zone, have students evaluate the drawings for compliance with applicable codes and standards.

Instructor Notes

1. CCR code changes take effect in summer 2025. Make sure you are teaching the most current WUI content.
2. See CAL FIRE's Fire Hazard Severity Zones, Defensible Space, and Wildfire Won't Wait! resources.
3. See Fire Safe Marin resources.

CTS Guide Reference: CTS 3-24

Unit 5: Special Operations

Topic 5-1: Evaluating Fire Protection Plans and Practices

Terminal Learning Objective

At the end of this topic a student, given a submittal package describing a facility housing a complex process or operation, will be able to evaluate fire protection plans and practices so that the fire growth potential for all areas is determined and the level of protection is appropriate to the hazard and in accordance with the applicable codes and standards and the policies and procedures of the AHJ.

Enabling Learning Objectives

1. Describe fire behavior and growth potential
    - Fire diffusion process
    - Tetrahedron
    - Types of heat
    - Flame development
    - Stages of fire
    - Heat Exposures
2. Describe fire growth potential
3. Describe protection
4. Analyze scenarios
5. Describe evacuation procedures
6. Observe and recognize deficiencies
7. Evaluate hazards

Discussion Questions

1. How do geometric space and compartmentalization affect fire growth?
2. How does passive fire protection help mitigate fire impact?

Application

1. Determined by instructor

Instructor Notes

1. The ELOs in Topic 5-1 are covered in more specific contexts in the remaining Unit 5 topics. Teach this topic as an overview to prepare students for those topics.

CTS Guide Reference: CTS 3-11

Topic 5-2: Evaluating Plans for Storage, Handling, and Use of Hazardous Materials

Terminal Learning Objective

At the end of this topic a student, given a submittal package, will be able to evaluate plans for storage, handling, and use of hazardous materials so that the plans are reviewed for compliance and deficiencies are identified, documented, and reported in accordance with applicable AHJ codes, standards, policies, and procedures.

Enabling Learning Objectives

1. Identify codes and standards used to determine hazardous materials compliance
    - California Fire Code
    - California Building Code
    - Standards incorporated by reference
2. Describe how to classify an occupancy containing hazardous materials
    - Maximum allowable quantity (MAQ)
        - Occupancy-specific exceptions
    - Occupancy-specific requirements (CBC, Chapter 4)
3. Describe properties of hazardous materials
    - Solids
    - Liquids
    - Gases
4. Describe physical hazards
    - Explosives and blasting agents
    - Combustible liquids
    - Flammable solids, liquids and gases
    - Organic peroxide solids or liquids
    - Oxidizer, solids or liquids
    - Oxidizing gases
    - Pyrophoric solids, liquids or gases
    - Unstable (reactive) solids, liquids or gases
    - Water-reactive materials solids or liquids
    - Cryogenic fluids
5. Describe health hazards
    - Highly toxic and toxic materials
    - Corrosive materials
6. Describe how to read a Safety Data Sheet (SDS)
7. Describe how to classify mixtures
    - In accordance with hazards of the mixture as a whole
    - In accordance with nationally recognized reference standards
        - By an approved qualified organization, individual, or Safety Data Sheet (SDS)
        - By other approved methods
8. Describe applicable standards for the storage, handling, and use of hazardous materials
    - Maximum allowable quantities

- Control areas
- Secondary containment
- Spill control
- Compatibility
- Arrangement
- Protection

9. Describe basic physical science as it relates to fire behavior and fire suppression
10. Identify reference materials and resources related to hazardous materials
    - CUPA
        - CERS
    - HMBP
    - HMMP
    - HMIS
    - Hazard mitigation analysis
    - USDOT
    - NOAA
        - CAMEO
        - ALOHA
    - California Fire Inspection Guide
11. Verify the classification of hazardous materials using reference materials

Discussion Questions

1. Can you use a standard that is not incorporated by reference to evaluate code compliance? Why or why not?
2. How are the storage requirements for flammable liquids in a mercantile display different from storage requirements in a laboratory?
3. How would a plan reviewer address the use of hazardous materials or flammable liquid storage cabinets during the plan review process?

Application

1. Given applicable codes and standards and a list of occupancy types and use(s) with associated hazardous materials management plans (HMMP), have students research and identify the thresholds for maximum allowable quantities and determine compatibility of hazardous materials in multiple occupancies.
2. Given a floor plan with identified secondary containment and spill control locations and dimensions and the California Fire Code, have students determine code compliance.
3. Activity 5-2: Safety Data Sheets

Instructor Notes

1. This topic covers both CTS 3-18 (OSFM), and CTS 3-19 (NFPA 1030 paragraph 8.3.17). However, they will be evaluated separately and appear as two JPRs in the task book.

CTS Guide Reference: CTS 3-18, CTS 3-19

Topic 5-3: Evaluating Compliance Approaches for Hazardous Materials

Terminal Learning Objective

At the end of this topic a student, given field inspection reports and proposed compliance alternatives, will be able to evaluate compliance approaches for the storage, handling, and use of hazardous materials, so that the hazardous materials are provided with a level of safety that is in accordance with the intent of applicable codes and standards and AHJ policies and procedures.

Enabling Learning Objectives

1. Analyze safety data sheets (SDS)
2. Describe fire protection systems and equipment appropriate for the material
    - Fully-sprinklered building
    - Approved cabinets
    - Fume hoods
    - Enclosures
    - Drainage and containment
    - Listed/approved tanks
    - Gas detection systems
3. Describe safety procedures
4. Identify other agencies that have requirements and AHJs related to hazardous materials, chemical reactions, and storage compatibility
5. Observe, recognize, and communicate deficiencies
6. Read plans and reports
7. Read safety data sheets

Discussion Questions

1. How can fire protection systems impact the maximum allowable quantities of hazardous materials?
2. What information can a CUPA give a fire plans examiner to assist with plan review?

Application

1. Determined by instructor

Instructor Notes

1. This topic covers both CTS 3-12 (NFPA 1030 paragraph 8.3.12) and CTS 3-13 (paragraph 8.3.13). However, they will be evaluated separately and appear as two JPRs in the task book.

CTS Guide Reference: CTS 3-12, CTS 3-13

Topic 5-4: Evaluating Plans for Equipment, Operations, and Processes

Terminal Learning Objective

At the end of this topic a student, given a submittal package, will be able to evaluate plans for equipment, operations, or processes, so that the equipment, operation, or process is reviewed for compliance with applicable codes and standards and deficiencies are identified, documented, and reported in accordance with applicable AHJ codes, standards, policies, and procedures.

Enabling Learning Objectives

1. Describe hazards of various equipment, operations, and processes used in commercial and industrial occupancies covered in California Fire Code
    - Aviation facilities
    - Dry cleaning
    - Combustible dust-producing operations
    - Moter fuel-dispensing facilities and repair garages
    - Flammable finishes
    - Fruit and crop ripening
    - Fumigation and insecticidal fogging
    - Semiconductor fabrication facilities
    - Lumber yards and agro-industrial, solid biomass, and woodworking facilities
    - Manufacture of organic coatings
    - Industrial ovens
    - Tents, temporary event structures, and other membrane structures
    - High-piled combustible storage
    - Fire safety during construction and demolition
    - Tire rebuilding and storage
    - Welding and other hot work
    - Marinas
    - Combustible fibers
    - Processing and extraction facilities
    - Distilled spirits and wine storage
    - Motion picture/television production studio sound stages, approved production facilities and production locations
    - Indoor trade shows and exhibitions
    - Temporary haunted houses, ghost walks, and similar amusement uses
2. Describe hazards of various operations used in commercial and industrial occupancies covered in California Building Code
    - Covered mall and open mall buildings
    - High-rise buildings and Group 1-2 occupancies with occupied floors located more than 75 feet above lowest level of fire department vehicle access
    - Atriums
    - Underground buildings
    - Motor-vehicle-related occupancies

- Group 1-2
- Group 1-3
- Motion picture projection rooms
- Stages, platforms, and technical production areas
- Special amusement areas
- Aircraft-related occupancies
- Combustible storage
- Hazardous materials
- Groups H-1, H-2, H-3, H-4 and H-5
- Spray application of flammable finishes
- Drying rooms
- Organic coatings
- Artificial decorative vegetations
- Groups R-1, R-2, R-2.1, R-2.2, R-3, R-3.1, and R-4
- Hydrogen fuel gas rooms
- Ambulatory care facilities
- Storm shelters
- Play structures
- Hyperbaric facilities
- Combustible dusts, grain processing, and storage
- Medical gas systems
- Special provisions for licensed 24-hour care facilities (in a Group R-2.1, R-3.1, R-4)
- Group I-4
- Road tunnels, bridges, limited-access highways
- Horse racing stables
- Pet kennels and boarding facilities
- Combustion engines and gas turbines
- Fixed guideway transit and passenger rail systems
- Explosives
- Winery caves
- Public libraries
- Group C
- K-12 school facilities and Group E childcare
- Group L
- Large family day-care homes

3. Describe applicable standards for arrangement and protection of various equipment, processes, and operations used in commercial and industrial occupancies
4. Read plans
5. Interpret and apply codes and standards

Discussion Questions

1. How does your jurisdiction handle operational permits?

2. What types of equipment, operations, and processes create significant hazards for firefighters and other response personnel?

Application

1. Given a submittal package, an application to perform a special process or operation, and applicable codes and standards, have students evaluate for compliance with applicable codes and standards.

Instructor Notes

1. None

CTS Guide Reference: CTS 3-27

Topic 5-5: Evaluating Protection Measure Approaches for Equipment, Operations, and Processes

Terminal Learning Objective

At the end of this topic a student, given deficiencies noted during a field inspection of a facility and proposed alternative methods or materials, will be able to evaluate protection measure approaches for equipment, operations, and processes, so that the equipment, process, or operation is provided with a level of protection that complies with the intent of applicable codes and standards.

Enabling Learning Objectives

1. Describe applicable codes and standards adopted by the AHJ
2. Describe fire protection systems
   - Code required systems
   - Optional systems (still has to meet code requirements)
3. Describe safe necessary precautions
4. Make observations
5. Recognize deficiencies
6. Resolve conflicts

Discussion Questions

1. How would a fire plans examiner consider inquiries regarding the use of alternative fire protection systems?
2. How would a fire plans examiner establish reasonable fire and life safety when evaluating protection measure approaches.
3. Who edits NFPA and what is wrong with them?

Application

1. Determined by instructor

Instructor Notes

1. None

CTS Guide Reference: CTS 3-15

Topic 5-6: Evaluating a Plan with Special (High-piled Combustible) Storage Arrangements

Terminal Learning Objective

At the end of this topic a student, given a plan with special (high-piled combustible) storage arrangements, will be able to evaluate a plan with special (high-piled combustible) storage arrangements so that the deficiencies are identified, documented, and reported in accordance with adopted codes and standards and AHJ policies and procedures.

Enabling Learning Objectives

1. Describe how to apply AHJ codes and standards for special (high-piled combustible) storage arrangements
2. Describe storage arrangements and layout
   - Size
   - Height
   - Aisle width
   - Solid piled
   - Palletized
   - Shelf
   - Rack (single, double, multiple)
   - Automated
   - Specialty
   - Bin box
   - Flue spaces
   - Solid shelving
3. Determine commodity types
   - I
   - II
   - III
   - IV
   - High hazard commodities
   - Plastics
     - Group A
     - Group B
     - Group C
   - Mixed Commodities
4. Describe general fire protection and life safety requirements
   - Size of high-piled storage area
   - All storage areas
   - Solid-piled storage, shelf storage, and palletized storage
5. Describe fire protection system requirements for high-piled combustible storage arrangements
   - High-piled storage protection using control mode density area (CMDA) sprinklers
   - CMSA requirements for storage applications

- ESFR requirements for storage applications
- Alternative sprinkler system designs
- Rack storage protection using in-rack sprinklers

Discussion Questions

1. How can a fire plans examiner address firefighter safety regarding high-piled combustible storage?
2. When is storage limited to six feet in height?
3. Where might you find high-piled combustible storage without fire sprinklers?

Application

1. Given a plan (that includes high-piled combustible storage), measuring tools, and applicable codes and standards, have students classify commodities and identify additional building requirements to permit storage above 12 feet.

Instructor Notes

1. See Table 3206.2 (CFC) for ELO 4.
2. See NFPA 13 (current edition) for ELO 5.

CTS Guide Reference: CTS 3-20

How to Read a Course Plan

A course plan identifies the details, logistics, resources, and training and education content for an individual course. Whenever possible, course content is directly tied to a national or state standard. SFT uses the course plan as the training and education standard for an individual course. Individuals at fire agencies, academies, and community colleges use course plans to obtain their institution's consent to offer course and provide credit for their completion. Instructors use course plans to develop syllabi and lesson plans for course delivery.

Course Details
The Course Details segment identifies the logistical information required for planning, scheduling, and delivering a course.

Required Resources
The Required Resources segment identifies the resources, equipment, facilities, and personnel required to deliver the course.

Unit
Each Unit represents a collection of aligned topics. Unit 1 is the same for all SFT courses. An instructor is not required to repeat Unit 1 when teaching multiple courses within a single instructional period or academy.

Topics
Each Topic documents a single Terminal Learning Objective and the instructional activities that support it.

Terminal Learning Objective
A Terminal Learning Objective (TLO) states the instructor's expectations of student performance at the end of a specific lesson or unit. Each TLO includes a task (what the student must be able to do), a condition (the setting and supplies needed), and a standard (how well or to whose specifications the task must be performed). TLOs target the performance required when students are evaluated, not what they will do as part of the course.

Enabling Learning Objectives
The Enabling Learning Objectives (ELO) specify a detailed sequence of student activities that make up the instructional content of a lesson plan. ELOs cover the cognitive, affective, and psychomotor skills students must master to complete the TLO.

Discussion Questions
The Discussion Questions are designed to guide students into a topic or to enhance their understanding of a topic. Instructors may add to or adjust the questions to suit their students.

Application
The Application segment documents experiences that enable students to apply lecture content through cognitive and psychomotor activities, skills exercises, and formative testing. Application experiences included in the course plan are required. Instructors may add additional application experiences to suit their student population if time permits.

Instructor Notes
The Instructor Notes segment documents suggestions and resources to enhance an instructor's ability to teach a specific topic.

CTS Guide Reference
The CTS Guide Reference segment documents the standard(s) from the corresponding Certification Training Standard Guide upon which each topic within the course is based. This segment is eliminated if the course is not based on a standard.

Skill Sheet
The Skill Sheet segment documents the skill sheet that tests the content contained within the topic. This segment is eliminated if the course does not have skill sheets.