SFT Logo

CA-219: Wildland Firefighting - Firing Operations

Course Plan

Course Details

Description:	This course provides information and develops skills required to perform and hold firing operations on wildland fires and prescribed burns. This course contains a mix of online and instructor-led training including live fire exercises. The students will be engaged in wildland firefighting and firing operations. Students are required to complete the online training portion of the course and pre-course quizzes prior to taking the instructor-led training. This course meets and exceeds the objectives of the NWCG S-219 Firing Operations (2014) course.
Designed For:	Fireline supervisors and prescribed burn personnel
Authority:	Office of the State Fire Marshal Office of Emergency Services
Prerequisites:	NWCG 310-1: Wildland Firefighter Type 1 (FFT1); **and** S-290: Intermediate Wildland Fire Behavior (classroom only); **and** Online component for NWCG S-219: Firing Operations; **and** Two (2) pre-course instructor-developed quizzes
Standard:	Complete all activities Complete the summative test with a minimum score of 80% Complete all tasks in the CA-219: Firing Operations Task Book
Hours:	Lecture: 11:00 Activities: 20:00 Summative Test: 1:00
Hours (Total):	32:00
Instructor Level:	This courses requires one (1) CA-219 registered instructor and sufficient assistant instructors to meet the instructor/student ratios

Instructor/Student Ratio: Lecture: 1 primary instructor per 30 students

Demonstrations: 1 primary instructor per 30 students

Activities/Skills: 2 primary instructors + Enough primary instructors to maintain a 1:10 primary instructor/skills coach ratio + Enough skills coaches to maintain a 1:5 ratio of skills coach/student ratio

Restrictions: Students must possess the arduous level of physical ability per NWCG guidelines and be in excellent health. Students are required to perform hotline wildland firefighting using hand tools, while carrying 40 pounds of back pumps or drip torches in hot weather.

Required Resources

Instructor Resources

The following instructor resources are available online at:
https://osfm.fire.ca.gov/divisions/state-fire-training/fstep-curriculum/

- CA-219: Wildland Firefighting - Firing Operations Course Plan
- CA-219: Wildland Firefighting - Firing Operations Burn Package
- CA-219: Wildland Firefighting - Firing Operations Student Activity Sheets
- CA-219: Wildland Firefighting - Firing Operations Task Book
- CA-219: Wildland Firefighting - Firing Operations Case Studies
- CA-219: Wildland Firefighting - Firing Operations Instructor Guide
- CA-219: Wildland Firefighting - Firing Operations Power Point
- Fire Ecology and Firing Operations, UC Davis

The following instructor reference resources are available online at:
http://www.nwcg.gov/pms/pubs

- Fireline Handbook Appendix B, PMS 410-2, NWCG
- Gaining an Understanding of the National Fire Danger Rating System, PMS 932, NWCG
- Incident Response Pocket Guide, PMS 461, NWCG
- Interagency Ground Ignition Guide, PMS 443, NWCG
- Interagency Prescribed Fire Planning and Implementation Procedures Guide, PMS 484, NWCG
- Wildland Fire Incident Management Guide, PMS 210

Student Resources

Prior to participating in this course, the student must complete the online component for NWCG S-219: Firing Operations Online Module at:
https://wildlandfirelearningportal.net/enrol/index.php?id=1033

To participate in this course, the following student resources are available online at:
http://www.nwcg.gov/pms/pubs

- Aids to Determining Fuel Models, INT-122, US Forest Service
- Fireline Handbook Appendix B, PMS 410-2, NWCG
- Incident Response Pocket Guide, PMS 461, NWCG

To refresh for the course and precourse quizzes, the following student resources are available online at:
http://www.nwcg.gov/pms/pubs

- Basic Land Navigation, PMS 475, NWCG

- Fire Behavior Field Reference Guide, PMS 437, NWCG
- Fire Weather Handbook, PMS 425, USDA Forest Service
- Interagency Ground Ignition Guide, PMS443, NWCG
- S-290: Intermediate Wildland Fire Behavior Student Workbook, NFES 002891, NWCG
- Wildland Fire Incident Management Guide, PMS 210, NWCG

Facilities, Equipment, and Personnel

The Registered Instructor must arrange for a classroom facility and a wildland burn area. Considerable coordination between the fire jurisdiction, the landowner, and the Air Resources Board is required, which needs plenty of lead-time prior to the advertising of the course and must continue until the burn is complete.
The following facilities, equipment, or personnel are required to deliver this course:

Facilities

- Classroom
  - Adequate table arrangement for student activities for groups of up to 6 students
- Burn Site
  - Suitable fuel and topography
    - 1.5 acres per student
    - Fuel model 1 or 2
    - Rolling hill terrain
    - No impact to exposures
    - Low escape potential
- Restroom or portable toilets
- Location for an incident command post (ICP)
- Rehab station for ICP
  - Shade canopies (also consider seating)
  - Ice chests with ice and water
- Rehab Stations for each squad
  - With shade
  - Ice chests with ice and water (minimum 1 gallon per student per day)
  - Electrolyte supplement (minimum 1 per student)
- Medical Unit with shade or ambulance staffed with EMT and equipped with trauma kit, oxygen, and burn kit

Equipment

- Computer projection screen and amplified speakers
- Engine Type 3, 5, or 6, 1 per squad minimum (additional as needed to meet contingency plan or to facilitate suppression crew and overhead training)
- All students are required to bring OSHA required wildland PPE, fireline gear with OSHA approved fire shelter, and 2 quarts of water

Tools

- Drip torch: 3 per squad (minimum)
- Backfire fusee 10 minute: 2 per student
- Flare launcher: 1 per squad (minimum)
- Flare launcher flare: 1 per squad (minimum)
- Back pump: 2 per squad (minimum)
- McLeod tool: 2 per squad (minimum)
- Shovel (forestry, not round point): 1 per squad (minimum)
- Combi-tool: 1 per squad (minimum)
- Pulaski: 1 per squad (minimum)

Note: Instructors should add in devices that are used by the AHJ.

Personnel

- One Registered CA-219 Instructor for the classroom portion is required with a minimum class size of five (5) and maximum size class is 30 students. The live fire exercise requires one (1) CA-219 Registered Instructor to supervise and sufficient CA-219 Assistant Instructors and to coordinate student squads with holding forces. One CA-219 Assistant Instructor is required for each squad. The maximum squad size is six (6) students.

Pre-course Module: Firing Devices

Terminal Learning Objective

At the end of this module, a student will be able to identify the capability, proper safety precautions, and procedures for operating firing devices.

Enabling Learning Objectives

1. Describe how the safe and best uses of a drip torch
2. Describe how the safe and best uses of a fusee
3. Describe how the safe and best uses of a flare launcher
4. Describe how the safe and best uses of a pneumatic torch
5. Describe how the safe and best uses of a propane torch
6. Describe how the safe and best uses of a terra torch
7. Describe how the safe and best uses of a plastic sphere dispenser (PSD)
8. Describe how the safe and best use of a helitorch

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, 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
    - Student evaluation process
    - Assignments
    - Activities
    - Required student resources
    - Class participation requirements
4. Identify the cooperating agencies needed to present this class

Discussion Questions

1. Who has had previous firing experience? What was involved?

Activities

1. Complete Activity 1-1: Student Expectations

Instructor Notes

1. Arrange the students' seating by squads before class, mixing ranks and departments.
2. Review precourse quizzes with the students.
3. Review precourse online training with the students.
4. Survey the students for their equipment needs.

Unit 2: Fire Behavior and Firing

Topic 2-1: Fire Behavior Size up and the Standard Fire Orders

Terminal Learning Objective

At the end of this topic, a student will be able to describe how the Standard Fire Orders (FO) are used to guide size up of all probable and possible fire behavior of firing operations, wildfires, and prescribed burns.

Enabling Learning Objectives

1. Describe the use of the Standard Fire Orders as the rules of engagement
    - Systematic set of rules that are followed in order
    - Most entrapments and escape burns are from unexpected fire behavior
    - First three orders describe process to prevent unexpected fire behavior
2. Describe the meaning of "Keep Informed of Fire Weather Conditions and Forecasts"
    - Keeping Informed
        - National Interagency Fire Center (NIFC) Predictive Services website
        - National Weather Service (NWS) Fire Weather program
            - Daily fire weather forecasts
            - Requesting and using spot forecasts
            - Incident Meteorologist (IMET) forecast
            - Adjust for microclimate
    - Onsite fire weather
        - Microclimate
        - Monitoring before and during the burn
    - Fire weather conditions you must keep informed
        - Fuel moisture
            - Fine dead
            - Live fuel
        - National Fire Danger Rating System (NFDRS) indexes
            - Burning index (BI)
            - Energy release component (ERC)
            - Ignition component (IC)
            - Spread component (SC)

        - Fire danger rating
      - Fuels advisories
      - Drought indexes
      - Pocket cards
      - NICC's National Significant Wildland Fire Potential Outlook
3. Describe how to know what your fire is doing at all times
   - IAP briefing
   - Fire history
   - Preposition lookouts, consider Field Observers (FOBS) or a Fire Effects Monitor (FEMO)
   - FO #7: Maintain prompt communications with your forces, your supervisor and adjoining forces
4. Describe how to base all your actions on current and expected fire behavior
   - Predict most probable fire behavior to base tactical plans
   - Predict the possibility of a sudden change in fire behavior, generally based on potential weather change or spotting, to base safety and contingency planning
   - Elements of current and expected fire behavior that must be monitored and predicted
     - Intensity = BTU per second per foot(btu/sec/ft) = Flame length (FL)
     - Flame height and scorch height
     - Direction and rate of spread (ROS) in chains per hour (ROS ch/hr)
     - Type of fuel group and model
     - Crown fire activity of passive (torching), active, or independent
     - Potential ignition (PI)
       - Spotting and spotting distance
     - Vortexes
     - Fuel consumption
     - Type of spread: head, backing, and flanking

Discussion Questions

1. Who has experienced a sudden change in fire behavior that was not predicted?

Activities

1. Activity 2-1: Predictive Services

Instructor Notes

1. Review the predictive services and spot forecast website before class to see if live demonstration of predictive services and spot forecast request versus your digital presentation is appropriate.

Topic 2-2: The Fire Environment

Terminal Learning Objective

At the end of this topic, a student will be able to describe the effects of fire environment situations that have been responsible for unexpected changes in fire behavior.

Enabling Learning Objectives

1. Describe how the general weather and topography forms microclimates that vary the actual weather form the fire weather forecast
    - Solar radiation and slopes effect timing of winds and fuel moisture
    - Bodies of water and mountainous terrain
    - Thermal lows
2. Describe weather systems of concern for sudden changes in fire behavior
    - Cold fronts
    - Stable versus unstable atmospheres
    - Thunderstorms and pyrocumulus
    - Inversions and thermal belts
    - High pressure subsidence and night time relative humidity (RH) drops
    - Surfacing and dying foehn winds
    - Vortexes
        - Formation
        - Vortexes and firing
3. Describe topography that can cause sudden changes in fire behavior
    - Steep slopes and drainages and eruptive fire behavior
    - Saddles
    - Wind channeling and eddies
4. Describe fuels in standard terminology
    - Fuel groups
    - Fuel models
5. Describe how to size up fuel ignitability and potential to carry fire
    - Fuels availability
    - Characteristics responsible for ignition and spread
    - Probability of ignition
    - Crown fire potential

Activities

1. To be determined by the instructor.

Discussion Questions

1. During the Carr fire, what weather pattern was the cause of the run from Whiskeytown to Redding, California?
2. What weather pattern is responsible for the most entrapment is California?

Instructor Notes

1. Review case studies related to thermal lows such as the Decker, Spanish Ranch, Carr, and Eagle fires.
2. Review case studies related to foehn winds such as the Romero and Loop fires. Play the Cedar fire wind reversal video as the foehn wind is pushed aloft by the sea and canyon winds.
3. Review case studies related to wind eddies and vortex entrapments such as the Tuolumne and Indians entrapments.

Topic 2-3: Interaction of the Fire with Firing Operations

Terminal Learning Objective

At the end of this topic, a student will be able to describe how the fire and the firing operations may interact to create desired or undesired fire behavior.

Enabling Learning Objectives

1. Describe the relative burning characteristics of a head fire
2. Describe the relative burning characteristics of a backing fire
3. Describe the relative burning characteristics of a blanking fire
4. Describe the positive and negative effects of convection created by the fire and firing operations

Activities

1. To be determined by the instructor.

Discussion Questions

1. When firing, when is a head fire not desirable?
2. What is a fire behavior change that results in the greatest increase in ROS?

Instructor Notes

1. Review the Battlement Creek Entrapment.

Topic 2-4: Firing Operations beneficial to the ecology

Terminal Learning Objective

At the end of this topic, a student will be able to describe why the intensity and type of fire spread is important to achieving ecological goals of a prescribed burn and how firing operations at a wildfire may be carried out for positive environmental effects.

Enabling Learning Objectives

1. Describe how the timing can be important to the ecological benefits of firing
2. Describe how the burn intensity timing can be important to the ecological benefits of firing
3. Describe how residence time can be important to the ecological benefits of firing
4. Describe how scorch height can be important to the ecological benefits of firing

Activities

1. To be determined by the instructor.

Discussion Questions

1. What vegetation management burns have you been involved?
2. What unnecessary damage have you observed from a firing operation?

Instructor Notes

1. Present the ecological benefits of the burn for this class.
2. Present current vegetation management activities for the region.

Topic 2-5: Fire Behavior Predictions, Tactics, and Safety

Terminal Learning Objective

At the end of this topic, a student will be able to make the necessary fire behavior predictions to determine a tactical and safety plan.

Enabling Learning Objectives

1. Describe how to perform RH%, fine dead fuel moisture (FDFM)%, PI, ROS, and FL calculations utilizing *Fireline Handbook Appendix B*
2. Describe tactics appropriate for predicted flame lengths
3. Describe how to apply Standard Fire Orders 4-10 based on a tactical plan and fire behavior predictions of probable and possible fire behavior

Discussion Questions

1. In the US Fire Behavior Spread Model, what are the four variables used to determine fire behavior outputs?

Activities

1. Complete Activity 2-5: Predict Fire Behavior and Develop Tactical and Safety Plans

Instructor Notes

1. The activity needs to be a scenario involving a wildland fire and a proposed or ongoing firing operation.

Unit 3: Firing Boss Duties and Responsibilities

Topic 3-1: Authority and Responsibility for a Firing Operation

Terminal Learning Objective

At the end of this topic, a student will be able to describe the legal authority and responsibility for firing operations.

Enabling Learning Objectives

1. Describe the authority granted under California Public Resources Code Sec. 4426
2. Describe the authority granted under California Health and Safety Code Sec. 41801 and Sec 13055
3. Describe the authority granted by CARB Ex. Ord. G-73 Rule 444
4. Describe how each local Air Resource Board has regulations allowing training burns, vegetation management burns, and range improvement burns and procedures for approval
5. Describe the OES as a Cooperator with Cal Fire and federal agencies authority to perform firing operations
6. Describe the ICS chain of command authorities for burn out versus backfiring

Activities

1. To be determined by the instructor.

Discussion Questions

1. What are the policies in your area?

Instructor Notes

1. Review laws and AHJ policies for any updates.

Topic 3-2: Wildland Fire Organization

Terminal Learning Objective

At the end of this topic, a student will be able to describe the Firing Boss (FIRB) duties and responsibilities within the wildland fire organization

Enabling Learning Objectives

1. Describe the FIRB position and its variability within the ICS organization on wildland fires
2. Describe the duties of the FIRB on a wildland fire
    - Develops a Firing Plan that meets incident objectives and leader's intent in coordination with supervisor
    - Communicates objectives and firing plan to firing and holding personnel
    - Conducts briefings with firing and holding personnel
    - Assigns duties to firing team personnel
        - Firing Team Leader
        - Igniters
        - Lookouts/FOBS
    - Maintains close coordination with Holding Boss and supervisor
    - Closely monitors firing operations and main fire
    - Adjusts timing, sequence, personnel, and equipment as needed
    - Responsible for firing safety, coordinates with safety personnel
    - Responsible for logistical planning to support firing team
    - May be responsible for coordinating with Air Operations Branch Director (AOBD) or Air Tactical Group Supervisor (ATGS) or directly with aircraft

Activities

1. To be determined by the instructor.

Discussion Questions

1. What document is a good reference for FIRB responsibilities?

Instructor Notes

1. Have copy of NWCG's Single Resource Boss - FIRB Task Book available.

Topic 3-3: Prescribed Burn Organization

Terminal Learning Objective

At the end of this topic, a student will be able to describe the organization for a prescribed burn.

Enabling Learning Objectives

1. Describe the prescribed burn organization
2. Describe the duties of a FIRB on prescribed burns
    - Builds/executes firing plan
    - Supervises firing team
    - Responsible for briefing firing personnel
    - Adjusts timing, sequence, personnel and equipment as needed
    - Responsible for firing safety, coordinates with safety personnel

- Responsible for logistical planning to support firing team
- May be responsible for coordinating with AOPD, ATGS, or directly with aircraft

Activities

1. To be determined by the instructor.

Discussion Questions

1. What has been your experience participating in a prescribed burn?

Instructor Notes

1. Review prescribed burn organizations in the area.

Topic 3-4: Incident Action Plan (IAP) and Prescribed (RX) Burn Plan

Terminal Learning Objective

At the end of this topic, a student will be able to describe relevant information from an IAP and RX burn plan.

Enabling Learning Objectives

1. Describe critical information to the FIRB in the IAP and RX burn plan
2. Describe how the IAP is used to form an unplanned firing operation that will meet the leader's intent
   - Immediate need firing
   - Checklists
3. Describe the different burn plans required for State Responsibility Areas (SRA) and federal lands

Activities

1. To be determined by the instructor.

Discussion Questions

1. Who has been on an incident where they were involved with an immediate need firing?

Instructor Notes

1. Provide each student a prescribed burn plan and IAP with burning to become familiar for information covered in Topic 4-2 and Topic 4-3.

Unit 4: Firing Operations and Techniques

Topic 4-1: Types of Firing Operations

Terminal Learning Objective

At the end of this topic, a student will be able to identify the difference between common types of firing operations.

Enabling Learning Objectives

1. Identify the elements and uses of a burnout
   - Widen existing control lines
   - Remove receptive fuels to control spotting
   - Improve structure prep
   - Identify and establish anchor points

2. Identify the elements of a backfire
    - Used to control the spread of the main fire
    - Used to generate smoke over a fuel bed
    - Used to control fire intensity though sensitive resources
    - Not required to be set inside of a containment line
3. Identify the elements of a Rx fire
    - Identify differences and similarities between Rx fire and suppression fire objectives
    - Used to generate fire effects

Activities

1. To be determined by the instructor.

Discussion Questions

1. What are the benefits of burning a control line?
2. What are the fire effects?
3. Who has been involved in a firing operation?

Instructor Notes

1. Provide at least one example of a firing plan to prepare students for the next unit.

Topic 4-2: The Basic Elements of a Firing Plan

Terminal Learning Objective

At the end of this topic, a student will be able to describe a firing plan for both suppression and Rx fires.

Enabling Learning Objectives

1. Describe different types of firing plans for suppression
    - Objectives
    - Difference between tactical and strategic firing plans
    - Resource assignments
2. Describe Rx firing plans
    - Objectives
    - The prescription
    - Interagency burn plan
    - Resource assignments

Activities

1. To be determined by the instructor.

Discussion Questions

1. What are some the similarities between suppression and RX firing plans?
2. What are some of the typical resource assignments of both RX and suppression firing plans?
3. What are some actions that the FIRB will be responsible for to ensure objectives are met?

Instructor Notes

1. Use an example burn plan and map when presenting this topic.

Topic 4-3: Critical Factors for Reconnaissance of a Firing Operation

Terminal Learning Objective

At the end of this topic, a student will be able to describe the critical factors for reconnaissance of a firing operation.

Enabling Learning Objectives

1. Describe the reconnaissance process
    - Fire behavior influences
    - Resource capability
    - Possible weak points in the plan
    - Human factors

Discussion Questions

1. Where do you find information about fire behavior?
2. How do you become familiar with the resources carrying out the plan?
3. What are potential human factors that will affect the outcome of a burn?

Activities

1. Complete Activity 4-3: Burn Plan Review

Instructor Notes

1. Provide each student a copy of the Lowden Ranch Prescribed Fire Review as precourse material or handout on Day 1 of the class.

Topic 4-4: Test Fires and the Go/No-Go Decision

Terminal Learning Objective

At the end of this topic, a student will be able to conduct appropriate test fires and successfully implement a Go/No-Go checklist.

Enabling Learning Objective

1. Identify the key components of a test fire
    - Use representative fuel bed
    - Secure all sides of the unit
    - Document fire behavior and weather
2. Describe the components of a Go/No-Go checklist
    - Document required contacts and notifications
    - Assign weather both on-site and spot forecast
    - Check components of the RX when applicable
    - Ensure forecasted weather will allow the burn to remain inside the prescribed burn area
    - Ensure forecasted weather will allow for holding the prescribed burn
    - Ensure resources are adequate and prepared for firing
3. Describe the context for test fires and Go/No-Go checklists utilization
    - Suppression firing often uses both test fires and a Go/No-Go checklist
    - May be done verbally and within the chain of command

Activities

1. Provide each student with the Go/NO-GO checklist and review for the burn exercise.

Discussion Questions

1. What is the purpose of a test fire?
2. How will daily weather changes affect the operation?

Topic 4-5: Technique, Sequence, and Organization of an Ignition Team

Terminal Learning Objective

At the end of this topic, a student will be to describe the appropriate technique, ignition sequence, and organization of an ignition team to accomplish the planned objectives.

Enabling Learning Objective

1. Describe the different types of firing techniques and patterns and when they might be used
    - Strip firing 1-2-3 and 3-2-1
    - Dot firing
    - Spike firing
    - Chevron firing
    - Ring firing
    - Concentric firing
    - Backing fire into sensitive resources
    - Adjusting current pattern or selecting and alternate to minimize heat
2. Describe the key safety concerns when planning an ignition sequence
    - Fire from complex to simple if the weather is moving from simple to complex
    - Fire downhill
    - Fire out inside drainages rather than bringing fire into a drainage
    - Fire into the wind
    - Fire saddles with two lighters
    - Pretreat doglegs by combing or using two lighters
    - Use of check lines
3. Describe organizing an ignition team
    - Selecting equipment
    - Selecting number of lighters
    - Ensuring logistical support
    - Ensuring completion and comprehension of the briefing

Activities

1. To be determined by the instructor.

Discussion Questions

1. What are some ways a lighter can control the heat of the firing operation?
2. What are some ways that correct sequencing can mitigate holding problems?
3. What are some common ways that ignition teams are organized?

Instructor Notes

1. Display digital examples of ignition patterns, techniques, sequences, and ignition team composition

Topic 4-6: Coordination and Composition of Holding Forces

Terminal Learning Objective

At the end of this topic, a student will be to describe the uses of a holding force and organizing the resources to meet planned objectives.

Enabling Learning Objective

1. Describe the typical duties of a holding force
    - Assist with reconnaissance
    - Assist with selecting pattern and sequence
    - Treat jack-pots or problem areas
    - Organize water supply
    - Attend and comprehend all briefings
2. Describe the typical organization of a holding force
    - Supervision qualifications
    - Single engine company
    - Strike team of engines
    - Crews, dozers, and aircraft

Discussion Questions

1. What are some methods a holding team can take to control the heat of the firing operation?
2. What is one of the ways a holding team can mitigate holding problems?
3. What are some common approaches for organizing a holding team?
4. What are some logistical concerns of holding teams?

Activities

1. To be determined by the instructor.

Instructor Notes

1. Display digital examples of holding teams, mitigated problem areas, and an unmitigated line.

Topic 4-7: Risk Management

Terminal Learning Objective

At the end of this topic, a student will be to describe common risk management practices for firing operations.

Enabling Learning Objective

1. Describe the risk management process as applied to a firing operation
    - Collect information from vetted sources
    - Assess the operation for vulnerabilities

- Assess the probability of occurrence given forecasted fire behavior and resource assignments
- Create and implement controls
- Reassess

2. Describe the typical scenarios that threaten the success of a firing operation
   - Lack of supervision qualifications or experience
   - Time compression
   - Smoke management
   - Budget
   - Firing into burn windows that do not meet RX
   - Lack of reconnaissance
   - Lack of control over resources
3. Describe common risk reduction practices
   - Pretreat or modify fuels
   - Recruit experienced personnel to assist with lack of experience
   - Select alternate ignition time
   - Public notifications
   - Quality briefings
   - Build margin into operations with both resources and time

Discussion Questions

1. What are some ways a FIRB can mitigate risk?
2. What are some common problems with firing operations?
3. Have you experienced human factors that may have led to an unsuccessful firing operation?

Activities

1. Complete Activity 4-7: Elements of a Failed Burn

Instructor Notes

1. Lowden Ranch Rx Fire or Cerro Grande Rx Fire provide easy to obtain examples for the students to practice classroom-based risk management on a firing operation. It is important that the instructor emphasizes the clarity that hindsight provides for any unwanted outcome with regard to firing operations.

Unit 5: Live Fire Firing and Holding Tactics

Topic 5-1: Live Fire Organization and IAP Briefing

Terminal Learning Objective

At the end of this topic, a student will be able to describe or demonstrate the live fire ICS organization and objectives

Enabling Learning Objectives

1. Students will demonstrate the check in process
2. Students will describe the ICS organization of the burn
3. Students will demonstrate knowledge of the spot weather forecast

4. Students will demonstrate the use of required PPE
5. Students will describe the LCES procedures
6. Students will describe the rehab and emergency medical procedures

Discussion Questions

1. What type of fire behavior do you expect today based on the spot weather forecast?
2. What are the signs of heat stress?
3. What are the medical aid procedures?

Activities

1. Complete Activity 5-1: IAP Briefing

Instructor Notes

1. Provide Squad instructors with briefing on their prospective squads and task book sign offs before the exercise.
2. The Squad instructors will hold squad breakouts after the IAP briefing to introduce themselves, organize their squads, and assign equipment.
3. Designate briefing and breakout areas in advance.

Topic 5-2: Holding Equipment Use

Terminal Learning Objective

At the end of this topic, a student will demonstrate how to use equipment safely and effectively to hold firing operations and contain spots and slopovers.

Enabling Learning Objectives

1. Students will demonstrate line construction
2. Students will demonstrate how to cool or contain fire with back pumps and by throwing dirt
3. Students will demonstrate how to organize the squad and tool order for hotline and holding

Activities

1. Complete Activity 5-2: Holding Equipment Use. This may be combined with Activity 5-3: Firing Equipment Use

Instructor Notes

1. Instructor or a student with extensive wildland experience should demonstrate the use of equipment first if members of the squad lack wildland firefighting background.
2. Utilize students to cut breaks to breakup firing blocks.

Topic 5-3: Drip Torch and Fusee Use

Terminal Learning Objective

At the end of this topic, a student will demonstrate how use a drip torch and fusee safely and effectively.

Enabling Learning Objectives

1. Students will demonstrate set up of a drip torch
2. Students will demonstrate safe ignition and firing techniques and extinguishment of a drip torch

3. Students will demonstrate safe use and extinguishment of a fusee
4. Students will demonstrate line firing

Discussion Questions

1. Why should all firefighters carry a fusee on a wildland incident?
2. What direction should a lit drip torch always be pointed?
3. What is the difference between a road flare and a backfire fusee?

Activities

1. Complete Activity 5-3: Firing Equipment Use. This activity may be combined with Activity 5-2: Holding Equipment Use

Topic 5-4: Firing Techniques and Patterns

Terminal Learning Objective

At the end of this topic, a student will demonstrate the firing techniques and patterns as required by the Firing Operations Task Book.

Enabling Learning Objectives

1. Students will demonstrate strip firing with 1:2:3 and 3:2:1 patterns
2. Students will demonstrate dot firing
3. Students will demonstrate ring firing
4. Students will demonstrate strip firing utilizing grass crushed by tire tracks for wet line firing.
5. Students will demonstrate chevron
6. Students will demonstrate blow hole firing
7. Students will demonstrate defensive firing to protect a simulated structure or resource
8. Students will demonstrate firing dog leg and/or saddle

Activities

1. Complete Activity 5-4: Firing Techniques and Patterns

Instructor Notes

1. Demonstrate correct techniques and create scenarios working with the holding forces and other squads to facilitate accomplishing each objective.

Topic 5-5: Firing Boss

Terminal Learning Objective

At the end of this topic, a student will demonstrate the duties of a FIRB executing a safe and effective firing operation that meets the objectives given by the instructor.

Enabling Learning Objectives

1. Students will demonstrate the ability to complete a firing operation
2. Students will demonstrate the ability to plan a firing operation
3. Students will demonstrate the ability to brief subordinates on a firing plan
4. Students will demonstrate the ability to organize to accomplish the firing plan
5. Students will demonstrate the ability to adjust the firing plan or burn pattern as conditions change
6. Students will demonstrate the ability to coordinate with the holding forces

Activities

1. Complete Activity 5-5: Firing Boss

Instructor Notes

1. Play the role of DIVS supervising the FIRB and simulating an immediate need firing situation.

Time Table

Segment	Lecture Time	Activity Time	Total Unit Time
Unit 1: Introduction			
Topic 1-1: Orientation and Administration			
Lecture	0:45		
Activity 1-1: Student Expectations		0:45	
Unit 1 Totals	0:45	0:45	1:30
Unit 2: Fire Behavior and Firing			
Topic 2-1: Fire Behavior Sizeup and the Standard Fire Orders			
Lecture	1:30		
Activity 2-1: Predictive Services		0:30	
Topic 2-2: The Fire Environment			
Lecture	1:30		
Activity to be determined by the instructor		0:00	
Topic 2-3: Interaction of the Fire with Firing Operations			
Lecture	0:30		
Activity to be determined by the instructor		0:00	
Topic 2-4: Firing Operations Beneficial to the Ecology			
Lecture	0:30		
Activity to be determined by the instructor		0:00	
Topic 2-5: Fire Behavior Predictions, Tactics, and Safety			
Lecture	1:00		
Activity 2-5: Predict Fire Behavior and Develop Tactical and Safety Plans		1:00	
Unit 2 Totals	5:00	1:30	6:30
Unit 3: Firing Boss Duties and Responsibilities			
Topic 3-1: Authority and Responsibilities			
Lecture	0:30		
Activity to be determined by the instructor		0:00	
Topic 3-2: Wildland Fire Organization			
Lecture	0:15		

Segment	Lecture Time	Activity Time	Total Unit Time
Activity to be determined by the instructor		0:00	
Topic 3-3: Prescribed Burn Organization			
Lecture	0:15		
Activity to be determined by the instructor		0:00	
Topic 3-4: Incident Action Plan (IAP) and Prescribed (RX) Burn Plan			
Lecture	0:30		
Activity to be determined by the instructor		0:00	
Unit 3 Totals	1:30	0:00	1:30
Unit 4: Firing Operations and Techniques			
Topic 4-1: Types of Firing Operations			
Lecture	0:30		
Activity to be determined by the instructor		0:00	
Topic 4-2: The Basic Elements of a Firing Plan			
Lecture	0:30		
Activity to be determined by the instructor		0:00	
Topic 4-3: Critical Factors for Reconnaissance of a Firing Operation			
Lecture	0:30		
Activity 4-3: Burn Plan Review		0:45	
Topic 4-4: Test Fires and the Go/No-Go Decision			
Lecture	0:45		
Activity to be determined by the instructor		0:00	
Topic 4-5: Selecting the Technique, Sequence, and Organization of an Ignition Team			
Lecture	0:30		
Activity to be determined by the instructor		0:00	
Topic 4-6: Coordination and Composition of Holding Forces			
Lecture	0:30		
Activity to be determined by the instructor		0:00	

Segment	Lecture Time	Activity Time	Total Unit Time
Topic 4-7: Risk Management			
Lecture:	0:30		
Activity 4-7: Elements of a Failed Burn		1:00	
Unit 4 Totals	3:30	2:00	5:30
Unit 5: Live Fire Firing and Holding Tactics			
Topic 5-1: Live Fire Organization and IAP Briefing			
Lecture:	0:00		
Activity 5-1: IAP Briefing		1:00	
Topic 5-2: Holding Equipment Use			
Lecture:	0:00		
Activity 4-7: The Failed Burn		1:00	
Topic 5-3: Drip Torch and Fusee Use			
Lecture:	0:00		
Activity 5-3: Firing Equipment Use		0:30	
Topic 5-4: Firing Techniques and Patterns			
Lecture:	0:00		
Activity 5-4: Firing Techniques and Patterns		9:30	
Topic 5-5: Firing Boss			
Lecture:	0:00		
Activity 5-5: Firing Boss		4:00	
Unit 5 Totals	0:00	16:00	16:00
Course Totals	**11:00**	**20:00**	**31:00**

Course Totals

Segment Type	Time
Total Lecture Time (LT)	11:00
Total Activity Time (AT)	20:00
Total Written Test Time (WTT)	1:00
Total Course Time	**32:00**

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