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## Attachment 10

**Date:** August 22, 2019

**To:** State Board of Fire Services

**From:** Chris Fowler, Supervising Deputy State Fire Marshal, State Fire Training

**SUBJECT/AGENDA ACTION ITEM:**

CA-219 Ad-Hoc Committee Update Wildland Firefighting - Firing Operations Curriculum

**Recommended Actions:**

Approval of CA-219 Wildland Firefighting-Firing Operations Curriculum

**Background Information:**

On January 12, 2018, at the direction of Chief Ronnie Coleman, STEAC Chair, Chris Fowler, Supervising Deputy State Fire Marshal in State Fire Training, was appointed to assemble a STEAC ad hoc committee to address the issues raised at the STEAC Meeting.

The original agenda item was in response to a proposal made by Scott Vail, CalOES, Rep. of the CICC Task Force, at the January 12, 2018 STEAC meeting, and given to the California Incident Command Certification Task Force for our consideration of its merits by Chief Zagaris.

**Committee Members:**

Chris Fowler, CALFIRE State Fire Training  
Kevin Conant, CALFIRE State Fire Training  
Dave Barnett, STEAC member, FIRESCOPE Task Force Rep.  
Charlie Blankenheim, CAL FIRE  
Matt Brown, Instructor  
Randy Collins, STEAC member, CFTDA Pres., Santa Rosa Jr. College  
Todd McNeal, Instructor  
Pat Shreffler, Instructor  
Scott Vail, CalOES, CICC Task Force

**Analysis/Summary of Issue:**

There were numerous questions presented at the January STEAC meeting that were determined to warrant further discussion. There was industry concern about the live fire component and at what point it would be practical to incorporate it into a training program, as well as how to integrate qualified strike team leaders that have a lower level of training. These skills are critical to personnel safety as more local government and volunteer agencies participate in large-scale firing operations.

The robust NWCG pre-study requirements are now included in the CA-219 version.

- NWCG 310-1: Wildland Firefighter Type 1 (FFT1)
- S-290: Intermediate Wildland Fire Behavior (class room only version)
- Online component for NWCG S-219: Firing Operations
- Two (2) pre-course instructor-developed quizzes

The additional objectives and changes in content are included to increase proficiency and safety of firefighters by:

1. 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.
2. The adoption of additional objectives from the NWCG S-219 course will now provide the students with a broader base of knowledge on firing operations on wildland fires as well as how to conduct firing on a prescribed burn safely and effectively. The new objectives shall:
  - Identify the role of the Firing Boss,
  - Demonstrate effective use of firing equipment
  - Require the preparation of a plan that discusses fire behavior, firing techniques, safety and risk management considerations to meet objectives of the operation.
3. The course is now 32 hours, which will accommodate 2 full days of live firing and the completion of a task book to demonstrate competence of safety and effectiveness on wildland fires and prescribed burns.
4. The Implementation Plan details the coordination and timeline for the requirement live fire and task book completion.
5. If a student is unable to attend the required firing operations, the student will not receive an FSTEP diploma.
6. The taskbooks shall not to be returned to State Fire Training. It is the instructor's responsibility to maintain all student records and taskbooks as required by the State Fire Training Procedures Manual.

This curriculum was approved by STEAC on October 12, 2018.



# CA-219: Wildland Firefighting - Firing Operations

## Course Plan

### Course Details

<b>Description:</b>	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 precourse quizzes prior to taking the instructor-led training.	
<b>Designed For:</b>	Fireline supervisors and prescribed burn personnel	
<b>Authority:</b>	Office of the State Fire Marshal Office of Emergency Services	
<b>Prerequisites:</b>	NWCG 310-1: Wildland Firefighter Type 1 (FFT1) S-290: Intermediate Wildland Fire Behavior (class room only version) Online component for NWCG S-219: Firing Operations Two (2) precourse instructor-developed quizzes	
<b>Standard:</b>	Complete all activities Complete the summative test with a minimum score of 80% Complete all tasks in the CA-219: Firing Operations Task Book	
<b>Hours:</b>	Lecture:	11:00
	Activities:	20:00
	Summative Test:	1:00
<b>Hours (Total):</b>	32:00	
<b>Instructor Level:</b>	This courses requires one (1) CA-219 registered instructor and sufficient assistant instructors to meet the instructor/student ratios	
<b>Instructor/Student Ratio:</b>	Lecture: 1:30 (minimum 5 students)	Skills: 1:6

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**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.

### Course Goals

#### Terminal Learning Objective

At the end of this topic, a student will be able to safely and effectively plan, conduct, and hold firing operations that meet assigned objectives.

#### Enabling Learning Objectives

1. Identify the roles and responsibilities of the FIRB for planning, execution, safety, coordination, and evaluation of an ignition operation on a wildland or prescribed fire\*
2. Describe the difference between backfire and burnout firing operations and when the use of each is appropriate
3. Describe environmental conditions that can change fire behavior
4. Describe how firing operations may change fire behavior favorably increasing safety and effectiveness or unfavorably increasing losses and the potential of injuries
5. Describe the characteristics, applications, safety and availability of the various firing devices a FIRB has at their disposal\*
6. Given a wildland or prescribed scenario, prepare a firing plan and briefing that contains desired fire behavior, firing techniques, required resources, coordination, safety and risk management factors, and communication, to meet specific objectives\*
7. Demonstrate the ability to safely and effectively conduct burn operations that meet assigned objectives on live fire exercises

***\*All NWCG S-219 objectives are included***

## Required Resources

### Instructor Resources

The following instructor resources are available online at:

<http://osfm.fire.ca.gov/training/SFTCurriculum>

- 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

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

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- 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

The following instructor resources are available online from Emergency Management Consultants (EMC) Dropbox account, order from EMC by email at [p.shreffler@outlook.com](mailto:p.shreffler@outlook.com):

- 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

### 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://training.nwcg.gov/courses/s219/OCM01/index.html>

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.

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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.**

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### 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.

F E M N A L

### Precourse 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 Sizeup 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 sizeup 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 from 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 sizeup 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 in 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

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- 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

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- 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 through 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

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- 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?

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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

## CA-219: Wildland Firefighting - Firing Operations

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- 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

## CA-219: Wildland Firefighting - Firing Operations

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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

## CA-219: Wildland Firefighting - Firing Operations

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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

## CA-219: Wildland Firefighting - Firing Operations

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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.

F E M N A L

## CA-219: Wildland Firefighting - Firing Operations

### Time Table

Segment	Lecture Time	Activity Time	Total Unit Time
<b>Unit 1: Introduction</b>			
Topic 1-1: Orientation and Administration			
Lecture	0:45		
Activity 1-1: Student Expectations		0:45	
<b>Unit 1 Totals</b>	<b>0:45</b>	<b>0:45</b>	<b>1:30</b>
<b>Unit 2: Fire Behavior and Firing</b>			
Topic 2-1: Fire Behavior Sizeup and the Standard Fire Orders			
Lecture	1:30		
Activity 2-1: Predictive Services		0:30	
<b>Topic 2-2: The Fire Environment</b>			
Lecture	1:30		
Activity to be determined by the instructor		0:00	
<b>Topic 2-3: Interaction of the Fire with Firing Operations</b>			
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	
<b>Unit 2 Totals</b>	<b>5:00</b>	<b>1:30</b>	<b>6:30</b>
<b>Unit 3: Firing Boss Duties and Responsibilities</b>			
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		

## CA-219: Wildland Firefighting - Firing Operations

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	
<b>Unit 3 Totals</b>	<b>1:30</b>	<b>0:00</b>	<b>1:30</b>
<b>Unit 4: Firing Operations and Techniques</b>			
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	

## CA-219: Wildland Firefighting - Firing Operations

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	
<b>Unit 4 Totals</b>	<b>3:30</b>	<b>2:00</b>	<b>5:30</b>
<b>Unit 5: Live Fire Firing and Holding Tactics</b>			
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	
<b>Unit 5 Totals</b>	<b>0:00</b>	<b>16:00</b>	<b>16:00</b>
<b>Course Totals</b>	<b>11:00</b>	<b>20:00</b>	<b>31:00</b>

### Course Totals

Total Lecture Time (LT)	11:00
Total Activity Time (AT)	20:00
Total Written Test Time (WTT)	1:00
<b>Total Course Time</b>	<b>32:00</b>

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**Scott Vail**

*California Office of Emergency Services and CICCIS Task Force*

**Patrick Shreffler**

## CA-219: Wildland Firefighting - Firing Operations

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# CA-219: Wildland Firefighting – Firing Operations

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**Burn Plan  
January 2019**





California Department of Forestry and Fire Protection  
Office of the State Fire Marshal  
State Fire Training

F E M A R S H A L

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Cover photo courtesy of Brian Glass, Santa Clara County FD

## Section 1: Burn Plan Approval

**Notify the Duty Officer  
the Day of the Burn**

Agency with Wildland Jurisdiction

\_\_\_\_\_  
Name

I, the undersigned, have reviewed and approved the following burn plan for this course.

Agency Authorizing Official

\_\_\_\_\_  
Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

CA 219 Instructor

\_\_\_\_\_  
Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

## Section 2: Burn Information

Burn Location(s): \_\_\_\_\_  
*Address – Lat/Long – Section/Range/Township*

\_\_\_\_\_ *Address – Lat/Long – Section/Range/Township*

Burn Date(s): \_\_\_\_\_

Alternate Date(s): \_\_\_\_\_

Wildland Donated by: \_\_\_\_\_

	<i>Name</i>	<i>Phone Number</i>	<i>Email Address</i>
Local Air Resource Board Contact:			
Participating Agency(s):			
AHJ Training Coordinator:			
AHJ Facility Coordinator:			
AHJ Live Burn Site Coordinator			
Live Fire IC:			
Live Fire Safety Officer:			
Live Fire Plans:			
Live Fire Logistics:			
CA-219 Instructor:			
CA – 219 Assistant Instructors (Squad Instructors) 1 per squad (minimum)			

**CA-219: Wildland Firefighting – Firing Operations**  
**Section 2: Burn Information**

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CA – 219 Instructor Trainees (Optional)			

F E M A L E

## Section 3: Documentation of Action Items

I	NOTIFICATIONS	Date Completed	Initials
1.	Political Jurisdiction		
2.	Air Quality Management District		
3.	Press		
4.	Police Department		
5.	California Highway Patrol		
6.	County Sheriff		
7.	Water District/Company		
8.	Adjacent Property Owners		
9.	E.C.C. (obtain Incident #)		
10.			
11.			
II	DOCUMENTS	Date Completed	Initials
1.	Map of burn site Location		
2.	Press release		
3.	FSTEP course request		
4.	Instructions to property owner		
5.	Landowners agreement		
6.	Title search		
7.	Burn permit		
8.	CEQA exemption (if required)		
9.	Prescribed fire burn plan (if required)		
10.			
11.			
III	PREPLAN AND MAPS	Date Completed	Initials
1.	Meet with IC to develop Holding Force Plan and IAP		
2.	IAP (202, 203, 204, 205, 206, NWS spot forecast)		
3.	Site topo map with ICP, burn units, exposures, water supply, fuel breaks, and staging areas		
4.	IAP topo taps (8.5x11 or 11x17)		
5.	Contingency plan map (if applicable)		

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**Section 3: Documentation of Action Items**

6.	Transportation map to site Send to students and resources if needed		
7.	Heat stress rehab plan		
8.	Go/No-Go completed with BEHAVE PLUS – Fire behavior and flame length prediction tables based on site fuel model and slope		
9.	Logistics plan		
10.	Live fire firing training sequence and firing plan		
11.	Meet with IC, SO and Holding DIVS and/or TFL prior to burn to review burn day objectives and procedures		
12.			
13.			
<b>IV</b>	<b>LIVE FIRE LOGISTICS ORDERED/ON HAND</b>	<b>Date Completed</b>	<b>Initials</b>
1.	Two sources of water supply		
2.	Apparatus request (minimum): 1 engine per squad, 1 reserve engine		
3.	EMS request: Designated staffed aid station, EMS engine or ambulance		
4.	Radios request		
5.	Frequencies request		
6.	Drip torches: 3 per squad (minimum)		
7.	Back fire fusee 10 minute: 2 per student (minimum)		
8.	Flare launcher: 1 (minimum)		
9.	Flare launcher flares: 1 per squad (minimum)		
10.	Back pumps: 2 per squad (minimum)		
11.	McLeod tool: 2 per squad (minimum)		
12.	Shovel (forest fire, not round point): 1 per squad (minimum)		
13.	Combi-tool: 1 per squad (minimum)		
14.	Pulaski: 1 per squad (minimum)		
15.	Rehab station and ICP shade canopies (also consider seating)		
16.	Rehab station and ICP ice chests with ice and water		
17.	Rehab station and ICP drinking water: 1 gallon per student each day (minimum)		
18.	Rehab station electrolyte supplement: 1 per student (minimum)		
19.	Spot forecast request ordered for each burn day		
20.	ICS positions listed on IAP ordered as required		
21.			
22.			
23.			

**CA-219: Wildland Firefighting – Firing Operations**

**Section 3: Documentation of Action Items**

<b>V</b>	<b>LIVE FIRE TRAINING AREA</b>	<b>Date Completed</b>	<b>Initials</b>
1.	Secure utilities from fire exposure and student contact		
2.	Remove or secure all debris from fire exposure		
3.	Contingency breaks, as needed, to protect exposures		
4.	Contingency breaks to contain fire to approved area		
5.	Construct interior squad burn unit breaks		
6.	Set up Rehab Stations		
7.	Mark and note on maps hazards that are not removed		
8.	Ensure all designated roads are open and safe for participants; post as needed		
9.	Post signs notifying public of burn		
10.	Public access restricted		
11.	Security/locks (combo or key) or patrols		
12.			
13.			
<b>VI</b>	<b>BURN DAY ORGANIZATION</b>	<b>Date Completed</b>	<b>Initial</b>
1.	Assign a CA-219 Assistant Instructor to each squad (referred to as Squad Instructor)		
2.	Meet with Squad Instructors prior before the burn to review burn day procedures		
3.	Confirm squad assignments		
4.	Assign FOBS/FEMO as needed to monitor weather, fire behavior, to serve as Lookout and map burned acres		
5.			
6.			

## Section 4: Burn Day Instructor Checklist

I	GENERAL ACTIVITIES TO BE COMPLETED	Assigned To	Date Completed
1.	Have AQMD burn authorization number		
2.	Notify Duty Chief		
3.	Review spot forecast		
4.	Complete fire behavior forecast		
5.	Confirm instructor to student ratio (maximum 1:6)		
6.			
7.			
II	PREPARATION	Assigned To	Date Completed
1.	Establish ICP and briefing area		
2.	Establish ICS check-in		
3.	EMS treatment area established		
4.	Rehab area established		
5.	Two water sources at scene		
6.	Preburn onsite belt weather kit observation		
7.	Look Out/Weather Monitor assigned to take weather and to transmit, DB, RH, W, FDFM, and PI hourly		
8.	Inspect full breaks		
9.	All personnel meet PPE requirements		
10.	All students have authorized task book		
11.			
12.			
III	BRIEF INSTRUCTOR/FIRING COACH	Assigned To	Date Completed
1.	Squad assignments		
2.	Evolution schedule and locations		
3.	Evacuation signal		
4.	Live fire firing training sequence and firing plan		
5.	Assign squads to burn areas		
6.	Schedule		

**CA-219: Wildland Firefighting – Firing Operations**  
**Section 4: Burn Day Instructor Checklist**

7.	Site specific instructions and safety concerns		
8.	Contingency plan for spots and/or slopovers		
9.			
10.			
<b>IV</b>	<b>Incident Command</b>	<b>Assigned To</b>	<b>Date Completed</b>
1.	Post IAP map		
2.	Post objectives		
3.	Conduct ICS standard IAP briefing with all on scene		
4.	Review course objectives and procedure with all on scene		
5.	Ensure holding forces are familiar with the area before beginning burns		
6.			
7.			
<b>V</b>	<b>BURN INITIATION</b>	<b>Assigned To</b>	<b>Date Completed</b>
1.	Ensure all resources are correctly positioned		
2.	Complete Go/No-Go checklist		
3.	Conduct test burn		
4.	Test communications between all resources and squads		
5.	Initiate training exercise		
6.			
7.			
<b>VI</b>	<b>POST INCIDENT</b>	<b>Assigned To</b>	<b>Date Completed</b>
1.	Ensure mop up standards are met		
2.	Contact Agency Dispatcher and advise that burning complete		
3.	All students have been evaluated course task books completed as appropriate		
4.	Debrief with all		
5.	Critique training evolutions with instructors		
6.	Contact owner and advise of post burn information		
7.	Arrange patrol as needed		
8.			
9.			

## Section 5: Go/No-Go

### Go/No-Go Checklist Example

Location: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_

CA-219 Registered \_\_\_\_\_

Instructor: \_\_\_\_\_

Incident \_\_\_\_\_

Commander: \_\_\_\_\_

No fires to be ignited until the following items are satisfactory:

1. IAP approved by wildland jurisdiction \_\_\_\_\_
2. Spot forecast reviewed \_\_\_\_\_
3. Fire behavior prediction/observations within parameters \_\_\_\_\_
  - a. Fire behavior parameters checked hourly \_\_\_\_\_
4. All required holding forces on scene \_\_\_\_\_
5. All students and holding forces briefed on objectives and IAP \_\_\_\_\_
6. All students and holding forces briefed on contingency procedures \_\_\_\_\_
7. Lookouts posted and assigned to monitor weather and burns \_\_\_\_\_
8. Assign squad firing instructors' areas and holding forces \_\_\_\_\_
9. Confirm all site safety issues identified \_\_\_\_\_
10. Communications tested between all units and squads \_\_\_\_\_
11. Water supply confirmed \_\_\_\_\_
12. Site security confirmed \_\_\_\_\_
13. Dispatcher notified \_\_\_\_\_
14. All squads and holding resources confirm they are in position \_\_\_\_\_

## CA-219: Wildland Firefighting – Firing Operations

### Section 5: Fire Behavior Go/No-Go Parameters

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#### Fire Behavior Go/No-Go Parameters

The Go/No-Go fire behavior parameters shall be made from the spot forecast for planning purpose. The final decision for Go/No-Go shall be based on site observations and the agreed to maximum flame length with the IC and/or Agency Administrator that would create a safety or escape concern.

Lookouts and/or the CA-219 Registered Instructor will perform belt weather kit observations before burning, then hourly or sooner if a noticeable adverse change in the weather occurs. If flame lengths or any other fire behavior parameters are exceeded, no further ignitions will take place without IC approval or until the weather becomes favorable and no longer exceeds parameters. IC should consider wind direction, PIG, and escape potential.

For example, flame lengths may be exceeding parameters but the IC might allow the firing to continue because the firing squads can stay up wind of the flames, fire brands are not an issue, and good black has been established around the block making escape unlikely.

Weather observers will monitor, calculate, record, and transmit hourly: dry bulb, RH, eye-level wind and wind direction, FDFM%, and PIG%. The eye-level wind will be used for midflame wind speeds along with FDFM% on the Go/No-Go **Behave Plus** graph for predicting flame length.

#### Fire Behavior Parameter Go/No-Go Graph

Go/No-Go is based on predicted flame lengths that would be considered unsafe and/or unlikely for the holding crews to maintain control of the burn or would be unsafe for the firing squads. In fuel model 1 and 2, with no over-story, engines can generally attack flame lengths up to 10 feet. Areas that would require direct attack by hand tools alone would require a No-Go at flame lengths of 4 feet.

The NWCG fire suppression interpretations from flame length limit direct attack by hand tools alone to 4-foot flame lengths; engines and dozers limited to no greater than 11 feet.

Behave Plus runs can produce fire behavior charts for variables in wind and fuel moisture based on representative fuel model and slope. Wind and fuel moisture are the variable that change fire behavior on a given site.

The attached example is from the Vacaville CA-219 Test Course. This is the Go/No-Go fire behavior example chart for the Vacaville live fire exercise. The chart is based on FM 1 and an average of 15% slope.

#### Vacaville S-219 Firing Operations Go/No-Go Fire Behavior Parameters

For the CA-219 live fire exercise site at Cullen Hill on Allison Drive in Vacaville, California (Lat. N38 d 22.1886 min X Long 121 d 58.3213 min).

- FM 1
- Average slope 15%

**CA-219: Wildland Firefighting – Firing Operations**

**Section 5: Fire Behavior Go/No-Go Parameters**

- Belt weather kit observations to be made, recorded, and transmitted before burning, hourly and if a noticeable change in weather occurs. The CA-219 Registered Instructor will acknowledge the transmission.
- Weather observations will be DB, RH, eye-level wind, FDFM%, and PIG%. The eye-level wind will be used for midflame wind with the FDFM% to estimate expected flame length from the Behave Plus graph output chart below.

Replace this chart based on your actual burn site slope and fuel model if different

Vacaville  
Flame Length (ft)

1-h Moisture %	Midflame Wind Speed (upslope) mi/h					
	2	4	6	8	10	12
2	3.1	5.2	7.4	9.6	11.8	12.7
3	2.8	4.6	6.5	8.5	10.0	10.0
4	2.5	4.2	6.0	7.8	8.6	8.6
5	2.4	4.0	5.7	7.4	7.9	7.9
6	2.3	3.9	5.5	7.1	7.5	7.5
7	2.2	3.7	5.3	6.9	7.0	7.0

1-h Moisture	Midflame Wind Speed (upslope) mi/h					
	8	9	10	11	12	12
8	2.1	3.5	5.0	6.3	6.3	6.3
9	1.9	3.1	4.4	5.0	5.0	5.0
10	1.5	2.5	3.2	3.2	3.2	3.2
11	0.9	1.2	1.2	1.2	1.2	1.2
12	0.0	0.0	0.0	0.0	0.0	0.0

- Black line burning of the northern perimeter will be done first.
- A Go for the northern perimeter black line burn is a FL of 6-10 feet.
- No-Go for northern drill perimeter black line burn will be a S, SE, or E wind with an expected FL over 4 feet.
- No-Go for all other burns is FL greater than 10 feet, unless approved by the IC.

## Section 6: Example Documents

### CA-219 Press Release Example

#### Firefighter Training Burn Press Release and Public Notice

*(Date of release)*

*(Name and organization of releasing official)*

The *(fire organization with jurisdiction)* in cooperation with *(list cooperating organizations)* will be conducting a prescribed burn on *(date)* at *(location)*. Smoke will be visible from *(date and time)* to *(date and time)*.

This burn is being conducted to provide training essential for public and firefighter safety and to *(insert ecological benefits of the burn, i.e. hazardous fuels reduction, defensible space, invasive species control, range improvement etc.)*.

The public is urged to avoid the areas of *(locations)* for public and firefighter safety. *(List date and times of any roads or areas that may be restricted.)*

For questions please contact *(name, organization, email, telephone)*.

CA-219 Burn Site Property Owner’s Agreement Example

Live Fire Burn Site Agreement with  
*(Fire Organization) (address) and Property Owner(s).*

I *(We)*, *(names of property owner(s))*, being the owner of the real property whose APN Number is *(number)* located at *(address)*, do hereby grant permission to the *(fire organization)* to set fire and burn *(number)* acres of vegetation and *(list any improvements that may be authorized to burn)* with the exception of *(list any vegetation that should not be burned i.e. oak trees)* located at the address above and described herein for the purposes of live fire training and *(list prescribed burn goals)* during the period of *(date-date)*. I *(We)* certify that there is no insurance coverage on the described vegetation and *(list any improvements that may be authorized to burn)* and do hereby release all claims connected with or may occur out of the setting fire to the described property. I *(We)* certify that no hazardous materials are within the burn site described. The fire organization, however, should be aware that the following items, on or near the property, may be hazards to the firefighters:

*(List any hazards, i.e. powerlines, open wells, ditches, etc.)*

The *(Fire Organization)* agrees the above listed property will be released to the above owner(s) at the completion of the live fire training and extinguishment of all fires. The *(Fire Organization)* will notify the land owner when the burn is completed and all firefighters have been cleared from the scene. After the burn, the property owner(s) should *(list all property owner instructions and contact information for any additional mop up needs)*.

Property Description: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Agreed to on this date: \_\_\_\_\_

Property Owner (signature): \_\_\_\_\_

Fire Representative (signature): \_\_\_\_\_

## CA-219: Wildland Firefighting - Firing Operations

### Activity 1-1: Student Expectations

---

#### Student Expectations

##### Activity 1-1

**Format:** Squad

**Timeframe:** 0:45

##### Description

This activity provides instructors an insight into the students' expectations while also serving as an opportunity for the students to develop working relationships with their squad.

##### Materials

- Conference board/pads with markers/erasers

##### Instructions

1. Each squad writes their responses to the following question. (10 minutes)
  - What do you expect from this course?
2. Select a spokesperson.
3. The spokesperson will discuss the squad's responses with the class. (5 minutes)
4. Post your squad's list in the classroom and refer to it ensure the expectations are met as the subjects are covered in the class.

##### Instructor Notes

- Divide the class into their squads.
- Allow each squad 10 minutes to prepare.
- Allow each spokesperson 5 minutes for presentation and discussion.
- Review expectations, clarify as needed, and discuss when each will be presented.

## CA-219: Wildland Firefighting - Firing Operations

### Activity 2-1: Predictive Services

---

#### Predictive Services

##### Activity 2-1

**Format:** Squad

**Timeframe:** Homework  
0:30 (in class)

##### Description

This activity provides the students with experience accessing information required to keep current with fire weather conditions and forecasts using information from the Predictive Services website.

##### Materials

- Computer or smart phone
- Internet connection

##### Instructions

1. After class, each squad will prepare a report on current fire weather conditions and forecasts for their assigned location within a GACC Predictive Service Area (PSA) that will be presented at the next class session.
2. Select a spokesperson.
3. The spokesperson will discuss the squad's findings with the class. (5 minutes)

##### Instructor Notes

- Pick a different PSA for each squad.
- Allow each spokesperson 5 minutes for presentation and discussion.

## CA-219: Wildland Firefighting - Firing Operations

### Activity 2-5: Predict Fire Behavior and Develop a Tactical and Safety Plan

---

#### Predict Fire Behavior and Develop a Tactical and Safety Plan

##### Activity 2-5

**Format:** Squad

**Timeframe:** 1:00

##### Description

This activity provides the students with experience predicting the fire behavior of a planned burn.

##### Materials

- Computer or smart phone
- Internet connection

##### Instructions

1. Each squad will be given a firing scenario and the associated fire environment in order to complete a firing operation.
2. Predict the probable and possible fire behavior of the burn operation utilizing the *Fireline Hand Book, Appendix B* and any other fire behavior references. (30 minutes)
3. Select a spokesperson.
4. The spokesperson will discuss the squad's predictions with the class. (5 minutes)

##### Instructor Notes

- Present the scenario based on the fire environment and proposed burn plan with the potential or the history to cause an entrapment, such as Battlement Creek firing operation fatal entrapment.
- Allow each squad 30 minutes to prepare.
- Allow each spokesperson 5 minutes for presentation and discussion.
- Discuss with the students how the Fire Orders should have been used at the incident.

##### Answer Key

- Based on each case study selected.

## CA-219: Wildland Firefighting - Firing Operations

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

---

#### Critical Factors for Reconnaissance of a Firing Operation

##### Activity 4-3

**Format:** Squad

**Timeframe:** 0:45

##### Description

This activity provides the students with experience accessing information from the IAP or Burn Plan and the fire environment that may affect the outcome in order to determine if the Burn Plan is adequate.

##### Materials

- Case study burn plan and the fire environment at the time of the burn.

##### Instructions

1. Each squad will review the burn plan and identify the failures in the planning process. (30 minutes)
2. Select a spokesperson.
3. The spokesperson will discuss the squad's findings with the class. (5 minutes)

##### Instructor Notes

- Use case studies from a burn that escaped due to poor planning.
- Allow each squad 30 minutes to prepare.
- Allow each spokesperson 5 minutes for presentation and discussion.

##### Answer Key

- Based on each case study selected.

## CA-219: Wildland Firefighting - Firing Operations

### Activity 4-7: Elements of a Burn

---

#### Elements of a Failed Burn

##### Activity 4-7

**Format:** Squad

**Timeframe:** 1:00

##### Description

This activity provides the students with experience analyzing all the elements of a failed burn and poor risk management decisions, using all the information from Units 1-4.

##### Materials

- Case study of a failed burn operation and all related information
  - Burn plan
  - Fire environment
  - Firing operations
  - Holding action

##### Instructions

1. Each squad will review their case study and identify failures of operations. (30 minutes)
2. Select a spokesperson.
3. The spokesperson will discuss the squad's findings with the class. (5 minutes)

##### Instructor Notes

- Present a case study from a burn that escaped due to poor planning.
- Allow each squad 30 minutes to prepare.
- Allow each spokesperson 5 minutes for presentation and discussion.

##### Answer Key

- Based on each case study selected.

# CA-219: Wildland Firefighting - Firing Operations

## Activity 5-1: IAP Briefing

---

### IAP Briefing

#### Activity 5-1

**Format:** Squad

**Timeframe:** 1:00

#### Description

This activity provides each squad with information and organization required for a safe and effective learning environment for the live fire exercise.

#### Materials

- IAPs for each overhead, squad, and holding crew
- Briefing map
- Presentation easel
- Check-in table with ICS 211

#### Instructions

1. Plans Chief and/or Registered CA-219 Instructor will conduct a briefing of the live fire operations, following ICS standards.
2. After the briefing, the squads will attend breakout briefing with their Squad Instructor.
3. Holding Boss will have a breakout briefing with the holding forces.

#### Instructor Notes

- A minimum of one (1) Assistant CA-219 instructor per squad to serve as Squad Instructor.
- See the CA-219: Wildland Firefighting – Firing Operations Burn Plan for further information.

## CA-219: Wildland Firefighting - Firing Operations

### Activity 5-2: Holding Equipment Use

---

#### Holding Equipment Use

##### Activity 5-2

**Format:** Squad

**Timeframe:** 1:00

##### Description

This activity provides each squad with experience using the tools and procedures required for the squad to hold firing operations.

##### Materials

- Hand tools
- Back pumps
- Drip torch or fusee
- Wildland PPE
- Wildland Engine Type 3, 5, or 6

##### Instructions

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

##### Instructor Notes

- Instructor or a student with extensive wildland experience should demonstrate the use of the equipment first if members of the squad lack wildland firefighting background.
- Utilize students to cut breaks to breakup firing blocks.
- This activity can be combined with Activity 5-3: Firing Equipment Use.

## CA-219: Wildland Firefighting - Firing Operations

### Activity 5-3: Firing Equipment Use

---

#### Firing Equipment Use

##### Activity 5-3

**Format:** Squad

**Timeframe:** 0:30

##### Description

This activity provides each squad with experience to use drip torches and fusees safely and effectively.

##### Materials

- Hand tools
- Back pumps
- Drip torch or fusee
- Wildland PPE
- Wildland Engine Type 3, 5, or 6

##### Instructions

1. Demonstrate how to set up a drip torch.
2. Demonstrate safe ignition, firing techniques, and extinguishment of a drip torch.
3. Demonstrate safe use and extinguishment of a fusee.
4. Demonstrate line firing.

##### Instructor Notes

- This activity can be combined with Activity 5-2: Holding Equipment Use.

## CA-219: Wildland Firefighting - Firing Operations

### Activity 5-4: Firing Techniques and Patterns

---

#### Firing Techniques and Patterns

##### Activity 5-4

**Format:** Squad

**Timeframe:** 9:30

##### Description

This activity provides each squad with experience to perform the various standard hand firing techniques safely and effectively.

##### Materials

- Hand tools
- Back pumps
- Drip torch or fusee
- Wildland PPE
- Wildland Engine Type 3, 5, or 6

##### Instructions

1. Demonstrate strip firing with 1-2-3 and 3-2-1 patterns.
2. Demonstrate dot firing.
3. Demonstrate ring firing.
4. Demonstrate strip firing utilizing grass crushed by tire tracks for wet line firing.
5. Demonstrate Chevron firing.
6. Demonstrate blowhole firing.
7. Demonstrate defensive firing to protect a simulated structure or resource.
8. Demonstrate firing dogleg and/or saddle.

##### Instructor Notes

- This activity must be well coordinated with the other squads and holding forces.

# CA-219: Wildland Firefighting - Firing Operations

## Activity 5-5: Firing Boss

---

### Firing Boss

#### Activity 5-5

**Format:** Squad

**Timeframe:** 4:00

#### Description

This activity provides each squad with the opportunity to serve as Firing Boss Planning and execute an immediate need firing operation.

#### Materials

- Hand tools
- Back pumps
- Drip torch or fusee
- Wildland PPE
- Wildland Engine Type 3, 4, or 5

#### Instructions

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

#### Instructor Notes

- Instructor should play the role of DIVS supervising the FIRB and simulating an immediate need firing situation.

# CA-219: Wildland Firefighting - Firing Operations

---

## Firing Operations Task Book January 2019



California Department of Forestry and Fire Protection  
Office of the State Fire Marshal  
State Fire Training

# CA-219: Wildland Firefighting - Firing Operations

## Firing Operations Task Book January 2019

**Candidate:** [Click here to enter text.](#)

**SFT ID Number:** [Click here to enter text.](#)

**Fire Agency:** [Click here to enter text.](#)

**Issued By:** [Click here to enter text.](#)

**Issue Date:** [Click here to enter text.](#)

---

This Task Book includes course objectives from CA-219: Wildland Fire Training with Ignition Operations (2019), CA-234: Intermediate Firing Methods (2009), and NWCG Single Resource Task Book for the position of Firing Boss (2012).

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(916) 568-2911

Cover photo courtesy of Brian Glass, Santa Clara County FD

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F E M I N A L

## Purpose and Process

The State Fire Training Firing Operations Task Book is a performance-based document. It lists the Classroom, Experience or Position, and Job Performance requirements for course completion.

### Purpose

This Firing Operations Task Book focuses on a single State Fire Training course and identifies the minimum requirements necessary to perform the duties of the course. Completion of a Firing Operations Task Book verifies that the candidate has the required experience, holds the required rank or position, and has demonstrated the job performance requirements necessary to obtain that course completion certificate.

### Responsibilities

#### Registered Instructor Responsibilities

A Registered CA-219 instructor will only issue the CA-219: Firing Operations Task Book after verifying the candidate has:

- Successfully completed 310-1: Wildland Firefighter Type 1 (FFT1)
- Successfully completed S-290: Intermediate Wildland Fire Behavior (classroom only, not the online course)
- Successfully completed the summative test for CA-219: Wildland Firefighting – Firing Operations (2019)

#### Candidate Responsibilities

The candidate is the individual pursuing course completion. All candidates shall:

- Complete the Experience, Rank, and Job Performance Requirements.
- Sign and date the Candidate verification statement with an original wet-ink signature.
- Retain a copy of the completed Firing Operations Task Book.

#### Evaluator Responsibilities

An evaluator is any registered CA-219 Instructor at a 16-hour CA-219 Live Fire Burn conducted in accordance to the CA-219 Course Plan and the CA-219 Burn Plan.

A task book may have more than one evaluator. All evaluators shall:

- Complete a block on the Signature Verification page with an original wet-ink signature.
- Review and understand the candidate's task book requirements and responsibilities.
- Verify the candidate's successful completion of one or more job performance requirements through observation or review.

- Sign all appropriate lines in the task book with an original wet-ink signature to record demonstrated performance of tasks.

## Completion Process

When you receive your Firing Operations Task Book:

1. Thoroughly review the Experience, Rank, and Job Performance Requirements segments to make sure that you understand them.
2. Complete the Experience segment, if applicable.
3. Complete the Position segment.
4. Complete each requirement in the Job Performance Requirements segment and ensure that an evaluator signs and dates each one to verify completion.

FEMNAL

## Course Task Book Requirements

### Experience

The candidate meets one of the following requirements for experience.

- A minimum of one years' full-time paid experience in a California fire agency or cooperator as a fire fighter performing suppression or prescribed fire duties
- or
- A minimum of two years part-time paid or volunteer experience in a California fire agency or cooperator as a fire fighter performing suppression or prescribed fire duties
- or
- A combination of full-time paid or part-time/volunteer experience equal to one years' full-time paid experience in a California fire agency or cooperator as a fire fighter performing suppression or prescribed fire duties
- Part-time/volunteer to full-time paid ratio is 2:1 (for example, two months part-time/volunteer = one month full-time paid) [Insert experience requirement]

---

## Course Performance Requirements

All course performance requirements must be performed in accordance with the standards of the CA-219 Course Plan, CA-219 Burn Plan, CA-234, and NWCG S-219 at a live fire exercise conducted at an authorized training burn or prescribed fire.

### Equipment

1. Demonstrate how to care for, set up, and use a fusee.

*Date Completed:* \_\_\_\_\_ *Evaluator Verification:* \_\_\_\_\_

*Comments:* \_\_\_\_\_

2. Demonstrate how to care for, set up, and use a drip torch.

*Date Completed:* \_\_\_\_\_ *Evaluator Verification:* \_\_\_\_\_

*Comments:* \_\_\_\_\_

3. Demonstrate or describe how to care for, set up, and use launching firing devices.

*Date Completed:* \_\_\_\_\_ *Evaluator Verification:* \_\_\_\_\_

*Comments:* \_\_\_\_\_

4. Demonstrate or describe how to use back pumps and hand tools to hold firing operations.

*Date Completed:* \_\_\_\_\_ *Evaluator Verification:* \_\_\_\_\_

*Comments:* \_\_\_\_\_

### Firing Techniques and Patterns

1. Demonstrate the following firing techniques and/or patterns while coordinating with holding forces:

- a. Strip firing with 1-2-3 and 3-2-1 patterns

*Date Completed:* \_\_\_\_\_ *Evaluator Verification:* \_\_\_\_\_

b. Dot firing

Date Completed: \_\_\_\_\_ Evaluator Verification: \_\_\_\_\_

c. Ring firing

Date Completed: \_\_\_\_\_ Evaluator Verification: \_\_\_\_\_

d. Strip firing utilizing grass crushed by tire tracks for wet-line firing

Date Completed: \_\_\_\_\_ Evaluator Verification: \_\_\_\_\_

e. Chevron

Date Completed: \_\_\_\_\_ Evaluator Verification: \_\_\_\_\_

Comments: \_\_\_\_\_

f. Blowhole firing

Date Completed: \_\_\_\_\_ Evaluator Verification: \_\_\_\_\_

g. Defensive firing to protect a simulated structure or resource

Date Completed: \_\_\_\_\_ Evaluator Verification: \_\_\_\_\_

h. Firing dogleg and/or saddle

Date Completed: \_\_\_\_\_ Evaluator Verification: \_\_\_\_\_

### Firing Boss

1. Inspect personnel and verify all agency required PPE is worn and is in serviceable condition; take corrective action as needed.

Date Completed: \_\_\_\_\_ Evaluator Verification: \_\_\_\_\_

Comments: \_\_\_\_\_

2. Inspect all assigned equipment and verify it is in safe and serviceable condition. Takes corrective action as needed.

Date Completed: \_\_\_\_\_ Evaluator Verification: \_\_\_\_\_

Comments: \_\_\_\_\_

- Participate in an IAP briefing and describe the essential elements required for planning an effective and safe firing and holding operation.

*Date Completed:* \_\_\_\_\_ *Evaluator Verification:* \_\_\_\_\_

*Comments:* \_\_\_\_\_

- Develop the appropriate Burn Plan based on the IAP briefing, the current and expected fire behavior, and the objectives given by the instructor.

*Date Completed:* \_\_\_\_\_ *Evaluator Verification:* \_\_\_\_\_

*Comments:* \_\_\_\_\_

- Describe the potential situations that may occur during your planned operations that could cause injuries to your crew and your planned mitigation for those hazards based on the IAP, the briefing, and your observations.

*Date Completed:* \_\_\_\_\_ *Evaluator Verification:* \_\_\_\_\_

*Comments:* \_\_\_\_\_

- Organize the Ignition Team into a configuration that will produce the planned burn pattern with the correct firing sequence, spacing, and timing to meet objectives given by the instructor.

*Date Completed:* \_\_\_\_\_ *Evaluator Verification:* \_\_\_\_\_

*Comments:* \_\_\_\_\_

- Assign tasks or responsibilities to squad members, so that the instructions are complete, clear, and concise; safety considerations and LCES are addressed; and the desired outcomes are conveyed.

*Date Completed:* \_\_\_\_\_ *Evaluator Verification:* \_\_\_\_\_

*Comments:* \_\_\_\_\_

- Develop the Holding Plan based on assigned resources and forecasted fire behavior.

*Date Completed:* \_\_\_\_\_ *Evaluator Verification:* \_\_\_\_\_

*Comments:* \_\_\_\_\_

9. Organize and brief the holding forces on the Holding Plan for the planned firing operation, including contingency plans and LCES.

*Date Completed:* \_\_\_\_\_ *Evaluator Verification:* \_\_\_\_\_

*Comments:* \_\_\_\_\_

10. Initiate the Firing Plan at the appropriate time and adjusts firing pattern to actual conditions.

*Date Completed:* \_\_\_\_\_ *Evaluator Verification:* \_\_\_\_\_

*Comments:* \_\_\_\_\_

11. Maintain control and communication with Firing Personnel and make timely adjustments to firing sequence, spacing, and timing to meet objectives safely based on actual fire behavior and effectiveness of holding operations.

*Date Completed:* \_\_\_\_\_ *Evaluator Verification:* \_\_\_\_\_

*Comments:* \_\_\_\_\_

12. Coordinate with Holding Personnel to ensure holding actions are coordinated with Burners; take appropriate action to adjust holding force placement and tactics to changing conditions or undesired situations.

*Date Completed:* \_\_\_\_\_ *Evaluator Verification:* \_\_\_\_\_

*Comments:* \_\_\_\_\_

13. Adjust the Burn Plan or execute contingency plans as necessary to adapt to changing conditions, spot fires, or slopovers.

*Date Completed:* \_\_\_\_\_ *Evaluator Verification:* \_\_\_\_\_

*Comments:* \_\_\_\_\_

14. Monitor personnel for fatigue, heat stress, and injuries and immediately correct any improper tactic or unsafe act.

*Date Completed:* \_\_\_\_\_ *Evaluator Verification:* \_\_\_\_\_

*Comments:* \_\_\_\_\_

15. When firing operations are completed, achieve the desired objectives within the parameters established by the instructor.

*Date Completed:* \_\_\_\_\_ *Evaluator Verification:* \_\_\_\_\_

*Comments:* \_\_\_\_\_

16. Conduct appropriate debrief and burn critique with assigned personnel.

*Date Completed:* \_\_\_\_\_ *Evaluator Verification:* \_\_\_\_\_

*Comments:* \_\_\_\_\_

FINAL

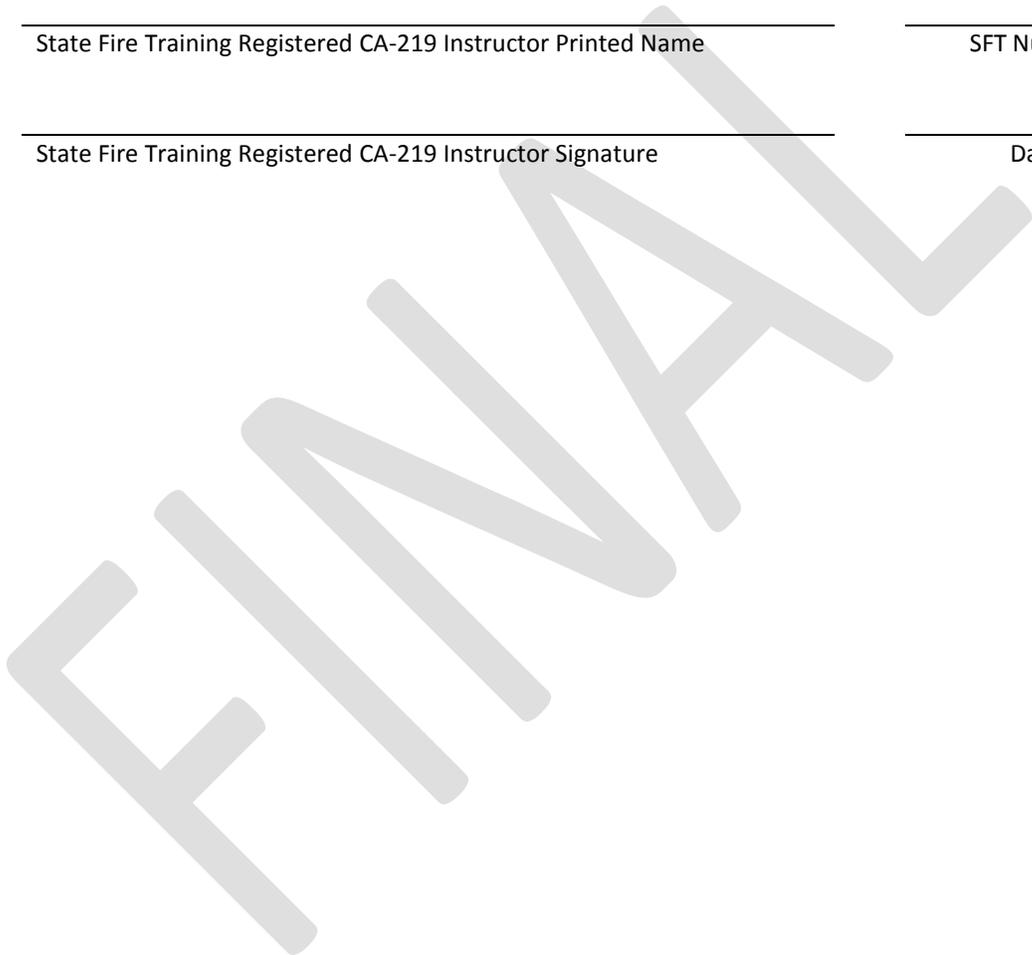


## Review and Approval

### Course Completion Certificate Issued

I verify that the candidate has met all requirements for this course completion certificate.

_____	_____
State Fire Training Registered CA-219 Instructor Printed Name	SFT Number
_____	_____
State Fire Training Registered CA-219 Instructor Signature	Date



## Signature Verification

The following individuals have the authority to verify portions of this task book using the signature or initials recorded below.

**Name:** \_\_\_\_\_ (print)

Job Title: \_\_\_\_\_ (print)

Organization: \_\_\_\_\_ (print)

Signature: \_\_\_\_\_ (sign)

**Name:** \_\_\_\_\_ (print)

Job Title: \_\_\_\_\_ (print)

Organization: \_\_\_\_\_ (print)

Signature: \_\_\_\_\_ (sign)

**Name:** \_\_\_\_\_ (print)

Job Title: \_\_\_\_\_ (print)

Organization: \_\_\_\_\_ (print)

Signature: \_\_\_\_\_ (sign)

**Name:** \_\_\_\_\_ (print)

Job Title: \_\_\_\_\_ (print)

Organization: \_\_\_\_\_ (print)

Signature: \_\_\_\_\_ (sign)

## CA-219 Burn Go-No-Go Checklist

Location: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_

Registered Instructor: \_\_\_\_\_

IC: \_\_\_\_\_

No fires to be ignited until the following items are satisfactory

1. IAP Approved by Wildland Jurisdiction \_\_\_\_\_
2. Spot forecast reviewed \_\_\_\_\_
3. Fire behavior prediction/observations within parameters \_\_\_\_\_
  - a. Fire Behavior parameters checked hourly \_\_\_\_\_
4. All required holding forces on scene \_\_\_\_\_
5. All students and holding forces briefed on objectives and IAP \_\_\_\_\_
6. All students and holding forces briefed on contingency procedures \_\_\_\_\_
7. Lookouts posted and assigned to monitor weather and burns \_\_\_\_\_
8. Assign squad firing instructors' areas and holding forces \_\_\_\_\_
9. Confirm all site safety issues identified. \_\_\_\_\_
10. Communications tested between all units and squads \_\_\_\_\_
11. Water supply confirmed \_\_\_\_\_
12. Site security confirmed \_\_\_\_\_
13. Dispatcher notified \_\_\_\_\_
14. All squads and holding resources confirm they are in position \_\_\_\_\_

## Fire Behavior Go-No-Go Parameters

An estimate of the Go-No-Go Fire Behavior parameters should be made from the spot forecast for planning purpose. The final decision should be based on site observations. Lookouts and/or the Registered Instructor will perform belt weather kit observations before burning, then hourly or if a noticeable adverse change in weather occurs. If Flame lengths or any other fire behavior parameters are exceeded no further ignitions will take place without IC approval or until the weather becomes favorable and no longer exceeds parameters. IC should consider wind direction, PI and escape potential.

Weather Observations will be recorded and FDFM% and PIG % will be calculated. The Eyelevel wind will be used for midflame wind speeds along with FDFM% on the Go-No-Go **Behave Plus** graph for predicting Flame Length.

### Fire Behavior Parameter Go-No-Go Graph

NO Go is based on predicted Flame lengths greater than 10 ft. Flames lengths greater than 10 feet exceeding NWCG Fire Suppression Interpretations from Flame Length parameters for direct attack by Engines.

Area that would require direct attack by hand tools alone would require a No Go at flame lengths of 4 feet.

The NWCG Fire Suppression Interpretations from Flame Length limit direct attacked by hand tools alone to hold the fire to 4-foot flame lengths.

Behave Plus graph requires a Behave Plus run based on representative fuel model and slope.

The attached chart is based on ( FM 1 ) and an average ( 15% ) slope.

(replace this chart based on burn site slope and fuel model if different)

1-h Moisture %	Midflame Wind Speed (upslope) mi/h					
	2	4	6	8	10	12
8	2.1	3.5	5.0	6.3	6.3	6.3
9	1.9	3.1	4.4	5.0	5.0	5.0
10	1.5	2.5	3.2	3.2	3.2	3.2
11	0.9	1.2	1.2	1.2	1.2	1.2
12	0.0	0.0	0.0	0.0	0.0	0.0

1-h Moisture %	Midflame Wind Speed (upslope) mi/h					
	2	4	6	8	10	12
8	2.1	3.5	5.0	6.3	6.3	6.3
9	1.9	3.1	4.4	5.0	5.0	5.0
10	1.5	2.5	3.2	3.2	3.2	3.2
11	0.9	1.2	1.2	1.2	1.2	1.2
12	0.0	0.0	0.0	0.0	0.0	0.0

## Example Vacaville CA-219

Vacaville S-219 Firing Operations weather observations and GO- NO-GO Criteria

For Vacaville drill site on Allison Drive.

FM 1 Average slope 15%

Belt weather kit observations to be made before burning, hourly and if a noticeable change in weather occur.

Weather Observations will be recorded and FDFM% and PIG % will be calculated. The Eyelevel wind will be used for midflame wind with the and FDFM% to estimate expected Flame Length from the Behave graph output chart below.

Operations, Holding and firing squads will be notified.

### Vacaville Flame Length (ft)

1-h Moisture %	Midflame Wind Speed (upslope) mi/h					
	2	4	6	8	10	12
2	3.1	5.2	7.4	9.6	11.8	12.7
3	2.8	4.6	6.5	8.5	10.0	10.0
4	2.5	4.2	6.0	7.8	8.6	8.6
5	2.4	4.0	5.7	7.4	7.9	7.9
6	2.3	3.9	5.5	7.1	7.5	7.5
7	2.2	3.7	5.3	6.9	7.0	7.0

1-h Moisture %	Midflame Wind Speed (upslope) mi/h					
	2	4	6	8	10	12
8	2.1	3.5	5.0	6.3	6.3	6.3
9	1.9	3.1	4.4	5.0	5.0	5.0
10	1.5	2.5	3.2	3.2	3.2	3.2
11	0.9	1.2	1.2	1.2	1.2	1.2
12	0.0	0.0	0.0	0.0	0.0	0.0

Black line burning of the northern perimeter will be done first.

A Go for the northern perimeter Black line burn is a is a FL .6-foot to 10 ft.

No-Go for northern drill perimeter black line burn will be a S, SE or E wind with an expected FL over 4 ft.

No-Go for all other burns is FL greater than 10 feet, unless approved by the IC.

CA-219 Press Release

Firefighter Training Burn Press Release and Public Notice

Date of release *(date)*

*(Name and organization of releasing official)*

The *(fire organization with jurisdiction)* in cooperation with *(list cooperating organizations)* will be conducting prescribe burn on *(date)* at *(location)*. Smoke will be visible from *(time & date)* to *(time & date)*.

This burn is being conducted to provide training essential for public and Firefighter safety and to *(insert ecological benefits of the burn, i.e. hazardous fuels reduction, defensible space, invasive species control, range improvement etc.)*.

The public is urged to avoid the areas of *(locations)* for public and firefighter safety. *(List date and times of any roads or areas that may be restricted)*

For questions please contact *(name, organization, email, telephone)*



# California State Fire Training

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## CA-219: Wildland Firefighting – Firing Operations Implementation of New Curriculum

This document is intended to provide information for all State Fire Training (SFT) stakeholders on the new CA-219 Wildland Firefighting – Firing Operations (2019) curriculum, which meets and exceeds the NWCG S-219 Firing Operations (2014) curriculum.

The development of this curriculum was a collaborative effort with the Office of the State Fire Marshal, State Fire Training; the Office of Emergency Services, Fire and Rescue Branch; CAL FIRE, Training Center (Ione); the California Fire Technology Training Director’s Association, and members of the prescribed fire community.

As described in previous STEAC documents, the NWCG S-234 Ignition Operations (2009) course was eliminated and replaced by NWCG S-219 Ignition Operations (2014), making the use of live fire optional. Due to concerns raised by OES and STEAC stakeholders, the CA-219 curriculum was developed and formatted into the SFT curriculum development model. Stakeholders are encouraged to study this information carefully and seek clarification from SFT if questions arise.

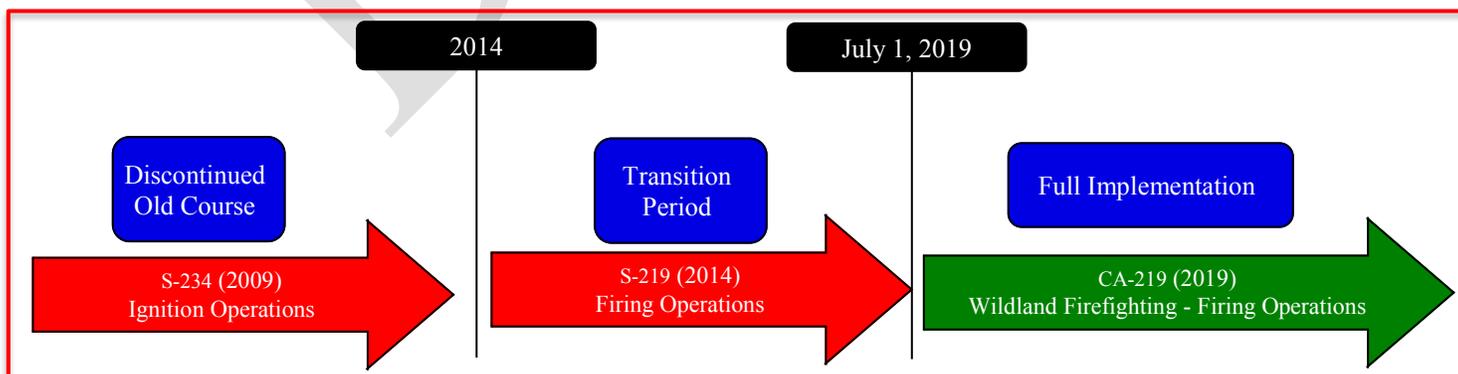
**NOTE:** Special attention should be paid to this new FSTEP course, as it NOT included in any current SFT certification track. This course will replace the S-234/S-219 courses in the SFT CIRM. Agencies that chose to utilize the NWCG S-219 curriculum will have to follow their own AHJ policy.

**CA-219: Wildland Firefighting – Firing Operations (2018)** The Course Plan has been developed based on the authority of the State Fire Marshal and the Office of Emergency Services. The Course Plan will be available on the SFT website.

**CA-219: Wildland Firefighting – Firing Operations (32:00 hours)**

### CA-219: Wildland Firefighting – Firing Operations (2019) Timeline

**FULL IMPLEMENTATION.....Effective July 1, 2019**



## **INSTRUCTOR REQUIREMENTS .....Effective July 1, 2019**

The following two pools of current SFT S-219 Registered Instructors are authorized to teach the new CA-219: Wildland Firefighting – Ignition Operations course:

1. Current SFT S-219 Registered Instructors who are also CAL FIRE C-234 instructors will be authorized to teach the CA-219: Wildland Firefighting – Ignition Operations course or;
2. Current SFT S-219 Registered Instructors who were members of the pilot CA-219 instructor cadre will be authorized to teach the CA-219: Wildland Firefighting – Ignition Operations course.

For all other SFT S-219 Registered Instructors who **DO NOT** meet the above criteria, will need to apply for a PACE II review of their instructor qualifications, including appropriate education and practical experience relating to course content including documentation of wildland live fire training. Any fees related to PACE II review shall be waived until June 30, 2019. Beginning July 1, 2019, new instructors will be required to either complete the new course or apply for a PACE II review and pay the appropriate fees.

Additionally, a new instructor of the FSTEP courses, the following shall apply:

1. Position and Professional Experience:
  - a. Held a permanent position within a Recognized Fire Agency in California for a minimum of three years or;
  - b. Worked in a volunteer position or paid call firefighter with a Recognized Fire Agency in California for a minimum of five years and;
  - c. Documentation of specific expertise in wildland live fire training - firing operations and;
  - d. Qualified as a Prescribed Fire Burn Boss (RXB1/2) or;
    - i. Qualified as a Division Supervisor (DIVS) or;
    - ii. Qualified as a Firing Boss (FIRB) or;
    - iii. Qualified as a Strike Team/Task Force Leader

### **SFT STAFF COORDINATION**

This is a new FSTEP course with State Fire Training. Staff will be required to facilitate the PACE process, expecting an inordinate number of PACE II requests regarding this course. Additionally, some students who have successfully completed the pilot CA-219 course in the past 24 months, may be applying for a course equivalency diploma. Staff will work with the pilot CA-219 registered instructors for task book completion confirmation prior to approving a CA-219 diploma.

### **POTENTIAL AGENCY IMPACTS**

Beginning July 1, 2019, State Fire Training will no longer be offering S-219 Firing Operations (2014) in the CIRM or issuing S-219 Firing Operations diplomas. All CA-219: Wildland Firefighting – Ignition Operations diplomas will clearly state that this course meets and exceeds the NWCG S-219 curriculum and should be considered a course equivalent. For those fire agencies utilizing the existing NWCG S-219 Firing Operations (2014) curriculum and course completion certification (diploma) as a condition of employment, promotion and/or CICC certification shall coordinate with their AHJ and/or their OES Operational Area for appropriate resolution.

Accredited Regional Training Programs (ARTP), Accredited Local Academies (ALA), community colleges and all other local delivery venues need to review the curriculum and seek approval from their curriculum committee/program sponsor, as appropriate.