

CFBT LEVEL II

COURSE INFORMATION SHEET



Course Description

Compartment Fire Behavior Training (CFBT) Level II builds on the foundational knowledge and skills developed in CFBT Level I. Critical learning outcomes include understanding the relationship between fire behavior indicators and fire development, the conditions that result in extreme fire behavior, and application of control measures to improve firefighter safety and fire control effectiveness.

Target Audience

CFBT Level II is intended for firefighters and fire officers. This is an intermediate level CFBT program, the case studies, hands-on exercises, and live fire training provide an excellent learning opportunity for members with varied experience levels.

Prerequisites

Participants must have completed the training required to participate in live fire training as outlined in National Fire Protection Association 1403 *Standard on Live Fire Training* (or the requirements of applicable state law, whichever is more stringent). In addition, ***participants must have completed CFBT Level I prior to attending the Level II course.***

Participants must be medically and physically qualified to wear self-contained breathing apparatus (SCBA). Occupational Safety and Health Administration (OSHA) Respiratory Protection regulations (29 Code of Federal Regulations (CFR) 1910. 134) require that individuals who wear self-contained breathing apparatus (SCBA) receive an annual medical evaluation and be fit tested for the breathing apparatus used. In addition, this regulation prohibits conditions that may interfere with facepiece seal (e.g., facial hair in the area of the facepiece seal).

NFPA 1981 Standard on Open-Circuit SCBA for Emergency Services (2007) and NFPA 1500 Standard on Fire Department Occupational Safety and Health Program (2007) provide additional information on the medical and physical qualification for the use of SCBA.

Class Size

The interactive nature of classroom presentation and hands-on, live fire elements of this course generally limit class size to a maximum of 12 participants. Larger classes may be accommodated, but this requires use of additional instructors and logistical support to ensure participant safety and an effective learning environment.

Credit/Certification

This course is not designed to meet specific certification requirements (however the content of this course meets in part the requirements of NFPA Standard 1001 Firefighter Professional Qualifications (5.3.10, 5.3.11, 5.3.12, and 6.3.2).

Schedule

This 16-hour course is generally delivered over two consecutive days and integrates classroom instruction, case studies, small-scale lab demonstrations, and several live fire training sessions to provide an overview of compartment fire behavior, dynamic risk assessment and 3D firefighting concepts.

Day 1

- Introduction & safety procedures
- Review of compartment fire behavior
- Extreme fire behavior case studies
- Nozzle techniques
- Door Entry Procedures
- Multi-compartment dolls house
- Fire Attack 1 (live fire)
- Debrief

Day 2

- Pre-training medical monitoring
- B-SAHF Exercise
- Introduction to ventilation tactics
- Understanding fire flow
- Case presentations and discussion
- Door entry practice
- Fire Behavior Demo 3 (live fire) or multi-compartment doll's house
- Fire Attack 3 (live fire)
- Debrief and closing Session

Learning Outcomes

Critical learning outcomes include understanding the relationship between fire behavior indicators and fire development, the conditions that result in extreme fire behavior, and application of control measures to improve firefighter safety and fire control effectiveness. Specific learning outcomes are as follows:

Introduction and Safety Procedures (Classroom)

- Recognize the need for ongoing study of practical fire dynamics.
- Understand how medical monitoring and other safety procedures used during CFBT Level II reduce risk and increase the safety of all participants.

Review of Compartment Fire Behavior (Classroom)

- Understand fundamental concepts involved in compartment fire development including pyrolysis, heat transfer, stages of fire.
- Explain the influence of burning regime (fuel or ventilation controlled) on fire development.
- Identify the impact of changes to the ventilation profile based on current burning regime.

Reading the Fire (Classroom)

- Identify fire behavior indicators in each of the following categories: Building, smoke, air track, heat, and flame
- Recognize the relationship between fire behavior indicators and stage of fire development and burning regime.

Extreme Fire Behavior Case Studies (Classroom/Out of Class Activity)

Analyze case studies involving extreme fire behavior to identify: The type of extreme fire behavior phenomena involved, causal factors that contributed to the occurrence of extreme fire behavior, and mitigation strategies that could have changed the outcome of the incident.

Nozzle Technique (Hand On)

- Describe the following performance characteristics of the nozzle and hose system used during the class: Nozzle type (automatic, variable flow, fixed flow), flow rate or range, droplet size (qualitative), pattern, and reach.
- Demonstrate proficiency in the following nozzle techniques: Short pulse, long pulse, penciling, and painting

Door Entry Procedures (Hands On)

- Demonstrate effective door entry procedures inclusive of door entry size-up and dynamic risk assessment.
- Identify key decision criteria for determining if conditions will permit entry.

Multi-Compartment Dolls House (Laboratory Exercise)

This exercise involves use of a two compartment dolls house to demonstrate the influence of ventilation profile on fire behavior.

- Identify factors influencing fire development in multi-compartment, small scale prop.
- Recognize the influence of ventilation profile on fire development and burning regime.
- Understand how changes in ventilation profile (increasing or decreasing ventilation) can influence fire development.

Fire Attack 1 (Live Fire)

- Describe anticipated fire behavior based on conditions experienced inside a compartment under actual fire conditions.
- Demonstrate the following nozzle techniques under actual fire conditions: Pulsing (short pulse), penciling, and painting
- Demonstrate the development and maintenance of a buffer zone by gas cooling while advancing and retreating.

B-SAHF Exercise (Classroom)

Given a photograph or video clip of a structure fire, use the B-SAHF indicators to identify the potential stage of fire development, burning regime, and potential changes in fire behavior in the next several minutes.

Fire Behavior Demonstration 3 (Live Fire) or Multi-Compartment Doll's House (Laboratory Exercise)

Fire Behavior Demonstration 3 requires a Window Cell to demonstrate fire development, flashover, and backdraft. If this prop is not available, the demonstration will be presented using video and laboratory exercises with multi-compartment dolls houses will be used to illustrate the same concepts and phenomenon.

- Recognize key fire behavior indicators related to flashover and backdraft.
- Explain how combustion efficiency influences the combustibility of smoke.
- Identify under what conditions smoke is likely to auto-ignite outside the structure.
- Understand how the mass fraction of gas phase fuel in smoke influences potential for backdraft.
- Recognize the development of a gravity current during horizontal ventilation.

Fire Attack 3 (Live Fire)

- Describe anticipated fire behavior based on conditions experienced inside a compartment under actual fire conditions.
- Demonstrate effective door entry procedures inclusive of door entry size-up and dynamic risk assessment under live fire conditions.
- Demonstrate the following nozzle techniques under actual fire conditions: Pulsing (short pulse), penciling, and painting
- Demonstrate the development and maintenance of a buffer zone by gas cooling while advancing and retreating.

Student Manual

CFBT-US provides clients with the Level II Student Manual in electronic (PDF) format for local duplication. This manual contains all of the required readings for the course as well as materials for in-class learning activities.

If at all possible, the Level CFBT II manual should be distributed to the learners in advance of the course to permit completion of pre-course review and reading of case study materials.

Learning Activities & Assignments

Learning activities include class discussion, oral presentation of individual and team findings related to three case studies, and participation in the hands-on elements of the course including two live fire evolutions demonstrating fire development in a compartment and techniques to control the fire environment.

Facilities & Logistics

There are a number of facility and logistical requirements necessary for effective delivery of CFBT Level II. These include:

Classroom

Required classroom facilities include a white board, projection screen, data projector, and seating at tables for the number of learners who will be participating in the class.

Live Fire Facilities

Generally CFBT Level II is conducted using a single level container-based fire training prop. However, course delivery may be adapted to burn buildings designed for Class A or Class B (gas) fuel. Contact CFBT-US for additional information on facilities requirements.

Logistical Support

Logistical requirements include the following:

- Duplication of Student Manuals (PDF file provided)
- SCBA for each participant (including CFBT-US Instructors)
- Students must have personal protective equipment as outlined in NFPA 1403.
- Cascade system or breathing air compressor for cylinder refill
- Drinking water for participant rehab
- Two fire apparatus capable of supplying multiple hoselines flowing 125 gpm
- Water supply to support hands-on training (continuous supply or 3000 gallons on-site)
- Two and four-compartment dolls houses for fire development lab exercise (these simple props are constructed from ¾" (16 mm) particle board (plans provided)
- Access to Emergency Medical Services (EMS)
- Fuel for live fire evolutions (approximately 16 sheets of ½" (12 mm) particleboard depending on the specific prop or live fire training facilities used).

During the initial live fire training evolution, the fuel requirements for this specific prop will be evaluated and adjusted. CFBT-US policy is to use the minimum amount of fuel that will meet specified training objectives (this minimizes risk to participants and waste of fuel materials). Fuel used during CFBT must meet the requirements outlined in NFPA 1403. Standard ½" (12 mm) particle board serves as a safe and effective fuel for compartment fire behavior training evolutions. This fuel provides predictable fire development and sufficient burn duration to conduct instructional activities. The evolutions conducted during this course typically require no more than 8 sheets of ½" (12 mm) particle board depending on container configuration. Use of varied types of fuel such as plywood, oriented strand board (OSB) results in a much higher heat release rate and shorter duration of burn. Pallets are an extremely variable fuel (type of wood, configuration, etc.). While these types of fuel are acceptable for some types of training activities, they are not generally used during basic CFBT.

Instructors

A minimum of two CFBT instructors are required for delivery of CFBT Level II (additional instructors may be needed depending on class size).

All CFBT-US instructors are experienced firefighters and fire officers who have completed CFBT Instructor program and have substantive experience in applying the knowledge and skills presented in this training program in an operational firefighting environment and in delivery of CFBT to diverse fire service audiences.

Training Philosophy

CFBT-US believes that learning is more than simply being present and receiving information. Participants are expected to actively engage in class activities and develop an expanded and deeper understanding of course concepts and basic proficiency in hands-on skills. Classes provide both classroom based and hands-on demonstrations and application activities to provide learners with a variety of ways to develop skill and understanding.

Course Policies

Learners must meet all prerequisites in order to participate in the live fire training segments of this course. Individuals who do not meet these requirements may participate in classroom sessions and laboratory exercises, but will be given a certificate of attendance rather than a certificate of completion.

Members are encouraged to share their experience and be active participants during class sessions. It is likely that information will be presented (either by the instructors or fellow learners) that will challenge participants current views about fire behavior or firefighting methods. Please keep an open mind and evaluate the ideas presented on the basis of both scientific principles and your experience as a firefighter.

The CFBT Level II course includes one out of class assignment. This assignment involves at least one case studies and preparing answers to a series of questions for the case. Completion of this assignment is not optional in that discussion of the case studies is an integral part of class activity.

Additional Information

For additional information on the CFBT Level II course or to request a quotation or proposal for delivery at your training facility, visit our web site or contact CFBT-US Chief Instructor Ed Hartin, MS, EFO, MIFireE, CFO.

Web Site: www.cfbt-us.com

Telephone: (503) 793-1296

E-Mail: ed.hartin@cfbt-us.com