



INSTRUCTIONAL EQUIPMENT REQUEST

Due in Dean/Unit Head's Office on October 15, 2010 (FALL) and February 11, 2011 (SPRING)

The Definition of Instructional Equipment can be found in the California Community College's Budget and Accounting Manual. A copy of these definitions is on the PBC webpage at: <http://grapevine.laspositascollege.edu/pbc/InstructionalEquipment.php>

Name of Requestor: Ext:

Division/Unit :

Brief title of request (equipment or materials being requested must be similar, related or part of a system):

Request amount (unit cost and total cost, including tax and shipping; please include all costs, such as installation, modification to existing facilities to accommodate new equipment, etc...; this information should come from the vendor quote):

Item (s) cost	\$3,935.00
Tax (.0975)	\$ 383.66
Shipping	\$ 146.38
Installation	\$0
Facilities Modification	\$0
Other	\$0
Total Cost	\$ 4,465.04

Attach copy of quote(s), estimate(s) and requisition(s).
(Must attach quote & requisition; absence of either will delay processing)

Please provide a brief description of the specific equipment or materials requested, including the # of pieces being requested, and what they will be used for (e.g., 10 crayola crayons, sky blue, etc...) in 250 words or less:

The BullEx Smoke Generator 6000 is a heavy-duty, high volume Smoke Generator for demanding training scenarios common with large academies and large classes where continuous smoke production is needed over several hours of instruction for large student enrollment courses such as found here at the Las Positas College Fire Service Technology Program. This equipment is designed to create large volume, non-toxic, environmentally safe smoke for simulating many different training scenarios required for firefighters from search and rescue, ventilation and initial fire attack. The smoke generator is necessary for re-creating zero visibility environments for realistic but safe simulated fire conditions. This smoke generator has a proven track record of providing continuous smoke in large rooms or spaces with extended hang-time to allow for continuous instruction with no delays, thus allowing for large enrollments to be maintained and instructional schedules to remain on track.

Is this in your Program Review? Yes No

Please describe how this request is incorporated into your Program Review:

This equipment was not originally identified in the last program review due to the fact that Las Positas College at this time does not provide a "Structural Firefighter I Academy" on the campus. However, in November of 2010, two course revisions were mandated by two accrediting bodies which identify the need and use of a "Smoke Generator" for Training and subsequent certifications that are issued to our students from these courses. FST 52 has been changed to "Fire Safety and Survival" which now includes a "Search and Rescue Training" component. This mandate comes from the "Fire Technology Directors Association", approved by the California State Fire Board and is a core program course requirement. The FST 86 Class has also been changed to "CAL Fire Basic Firefighter" which includes basic "Structural Firefighting" Instruction mandated by CAL Fire with similar a instructional requirement need.

Is it a replacement? Yes Upgrade? Yes New technology? Yes

Please explain?

We have not owned a smoke generator in the past since past instructional requirements did not dictate the use of this technology with the current courses delivered here at Las Positas College. This Technology was only required in "Structural Firefighter I Academies" That requirement has now changed with the recent mandated course revisions for FST 52 and 56.

Below is the evaluation criteria; please see corresponding Instructional Equipment Rubric at:
http://grapevine.laspositascollege.edu/pbc/documents/PBCInstructionalEquipmentRubric_2010-11.pdf

Teaching & Learning/Impact on Enrollment (Total = 10 points for A & B)

**A. How will this item have a positive impact on instruction and/or teaching and learning in the classroom?
Is this for use by the Instructor or students, or both?**

The use of this equipment allows for continuous recognition of our programs for meeting accreditation requirements for instructional delivery and use of all required technology and tools of the trade necessary for meeting certification requirements for our students. Students who successfully complete the FST 86 "CAL Fire Basic Firefighter" course are immediately eligible for seasonal employment throughout California as a "Wildland Basic Firefighter" with CAL Fire the largest fire service agency in the country. Las Positas College is one of only two accredited and approved campuses by CAL Fire, out of twelve other community college "Fire Technology" programs to deliver this course in the greater bay area. No others will be allowed this accreditation. The use of this equipment also meets core program requirements in the FST 52 class for graduation which includes a new lab component of instruction not required in the previous course outline. The use of this equipment is mandated in our core program requirements through the delivery of this new course. Realistic scenarios are necessary for instilling skills that can have an impact on the ability to complete all tasks to be mastered in a zero visibility environment, that can have a profound impact on the life safety and survivability to our students as they venture beyond our campus and become firefighters serving our communities.

B. How will the equipment impact enrollment, attract, or increase the number of students participating in a course or program?

Current enrollments have exceeded capacity in all courses offered in the FST Program for several years with no anticipation of enrollments declining in the near future but demand only continuing to increase. The acquisition and use of this equipment will provide continued recognition by our accrediting bodies for delivery of specific courses with certification provisions to continue. This will allow Las Positas to maintain its current interest and high enrollments in our program as we would be able to continue the delivery of program courses not found on other campuses. This is especially important when the FST 86 Course alone, can lead to direct employment opportunities even as students continue their educational objectives here at Las Positas College. Failing to meet accreditation requirements with appropriate equipment and training tools for delivering required instruction could lead to a loss of accreditation and enrollments within the program would be negatively impacted as students would relocate to campuses where this specialized instruction would or could become available.

Outcomes (Total = 10 points)

How does this equipment enable or enhance SLOs? What are the consequences related to learning outcomes if request is not funded?

Students will be able to clearly develop manipulative skills through performance of the skills under realistic conditions which would have an impact upon the meeting of SLO's for the course. Students will be developing personal life saving skills and safety skills which will have an impact upon themselves and the lives of those that they may find themselves attempting to save (i.e., search and rescue).

Total Cost of Ownership (Total = 5 points)

(This section attempts to identify what the ongoing costs of purchasing this equipment will be to the institution)

- a) **What is the lifespan of the equipment? 5 years? 10 years? 20 years?**
- b) **Is there sufficient current/planned space available for the storage and use of this equipment? If so, where will it be housed? If not, is there a proposed location and are there any costs associated with installation or modifications to the space?**
- c) **Are there operating costs and how will they be covered by the department?**
- d) **What will be required to maintain the equipment, such as regular servicing or upkeep? Who will perform maintenance, and what will the estimated costs be?**

A. With proper maintenance and care with appropriate handling the vendor states that this equipment can easily last 15-20 years.

B. Storage is available within the "Fire Service Technology" Training Facility on the campus in Portable Building 600B. There are no costs associated with storage nor necessary modifications for storage.

C. Operating costs are minimal with maintaining a supply of the "BullEx Smoke Liquid" a fluid used by the smoke generator to create the non-toxic, environmentally, safe smoke. The purchase of the product will be ongoing as supplies diminish and replacement supplies are necessary. They will be paid for out of the co-curricular account for Fire Service Technology.

D. Maintenance will be required to be performed by all Faculty who utilize the "BullEx Smoke Generator". Maintenance and cleaning is simple and will be performed after each use. There are no anticipated costs associated with maintenance

Health and Safety (Total = 2 points)

Explain if this equipment responds to a security or health and safety need for faculty and students:

The only inexpensive and alternative method to generate required smoke production for realistic training scenarios mandated by the accrediting bodies for the delivery of the course of instruction is to use "smoke grenades" or "smoke sticks". Both devices though inexpensive and an alternative to the "BullEx Smoke Generator" are devices that utilize an ignition component to allow for the burning of chemical compounds to produce smoke. This method raises several risk factors that are not acceptable to our students especially in large training venues such as with Fire Academies and / or classes. There is a risk of an actual fire from the devices actually coming in contact with combustible surfaces and or furnishings and commodities in the space. A risk of burns to students who may come in contact with the device in a zero visibility environment, and finally a risk associated to students with respiratory sensitivity who may breathe in some of the smoke particles. They do not produce intrinsically safe smoke particles that are safe for inhalation if that were to occur by a student who becomes disoriented and unable to complete the assigned task. These devices are more suited for post employment experienced firefighters who are refreshing skills and not developing them for the first time. A safe and healthy realistic scenario can be maintained without fear by students that they can be negatively affected in the training scenarios created by the instructional staff in learning important life saving skills.

Visibility/Profile within Community (Total = 1 point)

Is this a "flagship" item that will bring recognition/notoriety to the College or raise the stature of the program? Will it attract students and/or enhance the image of the College in the community because of its rare, one-of-a-kind status?

This item can be considered a flagship item since many other programs that do offer "Structural Training Academies" often utilize the "smoke grenades" or "smoke sticks" which are very risky and unsafe for pre-employment student training scenarios. Some programs have purchased retail over the counter smoke generators often found at stores during Halloween, only to find that they are useless in providing the continuous smoke generation required to take a large space down to zero visibility and sustaining zero visibility for significant periods of time and as well, developing it in a short period of time. This will be an additional tool that will bring about important recognition to the program has having the ability to provide a realistic and safe training environment not found with many other college programs across the state and allow us to continue to be recognized as a destination college within the discipline from other programs due to its ability to provide high quality courses not found on other campuses due to limited accreditation and approvals for the delivery of certain classes from accrediting bodies such as CAL Fire.

Commitment to Sustainability (Total = 1 point)

If the equipment exceeds basic sustainability goals or provides renewable resources to the College, provide specific details:

This equipment allows for the continued recognition of our program as a leader in the development and delivery of high quality curriculum and courses with the appropriate and required tools of the trade and instructional equipment to create realistic and safe training scenarios. This will continue to allow our program to only flourish and grow as many other programs are unable to meet basic training requirements due to a lack of appropriate and safe training equipment and tools to conduct the required and necessary training for accreditation and issuing of industry required certifications for employment.

Access (Total = 1 point)

Provide evidence that the requested equipment is consistent with universal design* and will ensure access above and beyond standard capability.

The "BullEx Smoke Generator" provides for the appropriate and required training tool for creating realistic and safe training environments. The "BullEx Smoke Generator" is specifically designed to produce immediate sustainable dense, thick smoke with a significant extended hang time. It utilizes advanced sensors and controls to enable the "BullEx Smoke Generator" to produce a continuous supply of smoke without recharging or heating. It is built on a chassis with all metal structural components for durability and ease of use thus allowing them to handle the toughest of training demands and environments, which will allow for many years of service. The "BullEx Smoke Generator" is by far the best continuously producing smoke generator in the market today for fire and emergency services training.

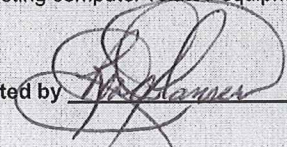
**Universal design is an approach that addresses and redresses the primary barrier to making expert learners of all students. Some examples include: light switches with large flat panels rather than small toggle switches; buttons and other controls that can be distinguished by touch; bright and appropriate lighting, particularly task lighting; auditory output redundant with information on visual displays; visual output redundant with information in auditory output; contrast controls on visual output; use of meaningful icons with text labels; clear lines of sight to reduce dependence on sound; volume controls on auditory output; speed controls on auditory output; choice of language on speech output. Items incorporating the principles of universal design feature: equitable use; flexibility in use; simple and intuitive; perceptible information; tolerance for error; low physical effort; and size and space for approach and use. (Wikipedia)*

Signatures (required)

(If requesting computer-related equipment/software, LPC IT Department Review is required.)

N/A

IT Department Signature

Requested by 

Dean/
Unit Head 

Vice President 

LPC VP Admin. Svcs/President

LPC Business Office Use (Account Number)

**Course Outline for Fire Technology 52
FIREFIGHTER SAFETY AND SURVIVAL**

I. CATALOG DESCRIPTION:

FST 52 – FIREFIGHTER SAFETY AND SURVIVAL - 3 Units

Basic principles and history related to the national firefighter life safety initiatives, focusing on the need for cultural and behavior change throughout the emergency services; assessing fire dangers and handling common fire situations; risk abatement and personal preparation for unforeseen fire emergencies; roles and responsibilities in educating the public on fire safety; development of a survival attitude using problem-solving techniques for increased situational awareness and self-reliance in an emergency. 3 hours lecture plus a total of 12 hours laboratory for the semester.

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: None

III. PREREQUISITE AND/OR ADVISORY SKILLS: None

IV. MEASURABLE OBJECTIVES:

Upon completion of the course the student should be able to:

- A. define and describe the need for cultural and behavioral change within the emergency services relating to safety, incorporating leadership, supervision, accountability and personal responsibility;
- B. explain the need for enhancements of personal and organizational accountability for health and safety, and the logistical role of personal accountability systems and Rapid Intervention Crews;
- C. define how the concepts of risk management affect strategic and tactical decision-making;
- D. describe and evaluate circumstances that might constitute an unsafe act;
- E. explain the concept of empowering all emergency services personnel to stop unsafe acts;
- F. validate the need for national training standards as they correlate to professional development inclusive of qualifications, certifications, and re-certifications;
- G. defend the need for annual medical evaluations and the establishment of physical fitness criteria for emergency services personnel throughout their careers;
- H. explain the vital role of local departments in national research and data collection systems;
- I. illustrate how technological advancements can produce higher levels of emergency services safety and survival;
- J. explain the importance of investigating all near misses, injuries and fatalities;
- K. discuss how incorporating the lessons learned from investigations can support cultural change throughout the emergency services, especially when firefighter and civilian injuries and deaths are factors;
- L. describe how obtaining grants can support safety and survival initiatives;
- M. formulate an awareness of how adopting standardized policies for responding to emergency scenes can minimize near-misses, injuries and deaths;

- N. explain how the increase in violent incidents impacts safety for emergency services personnel when responding to emergency scenes;
- O. recognize the need for counseling and psychological support for emergency services personnel, their families, as well as identify access to local resources and services;
- P. describe the importance of public education as a critical component of life safety programs;
- Q. discuss the importance of fire sprinklers and code enforcement;
- R. explain the importance of safety in the design of apparatus and equipment;
- S. explain the general safety precautions to implement for all emergencies;
- T. describe the procedures for responding on emergency vehicles;
- U. describe the safety considerations when handling energized electrical equipment incidents;
- V. describe the components of structural personal protective equipment and personal alert safety systems;
- W. describe safety considerations for incidents involving structure fires and structural collapse;
- X. explain safety considerations when performing fire ground operations involving ventilation, fire extinguishment, and hose line advancement;
- Y. explain safety considerations and procedures for vehicle fires and traffic control devices;
- Z. demonstrate basic firefighter survival skills when lost in a structure;
- AA. demonstrate methods for escaping an entrapment emergency;
- BB. demonstrate confidence and composure while navigating a blind course wearing respiratory protection.

V. CONTENT:

- A. Lecture
 - 1. Introduction
 - a. History of fire service culture
 - b. Organizational culture
 - c. Individual role in culture/behavior
 - d. History of line of duty deaths and injuries statistics
 - e. Defining the nature of the problem
 - 2. The national context, health and safety
 - a. National Fire Protection Association (NFPA)
 - b. Occupational Safety and Health Administration (OSHA)
 - c. Medical and fitness standards
 - d. Data collection (National Fire Incident Reporting System)
 - e. Research/Investigation
 - i. National Institute of Standards and Technology (NIST)
 - ii. National Institute of Occupational Safety and Health (NIOSH)
 - 3. Firefighter safety training
 - a. Certification and credentialing
 - b. Fundamental rescue considerations
 - i. Recognition of personal limitations
 - ii. Safety considerations during search and rescue
 - iii. Basic rescue
 - a) Emergency procedures
 - b) Rescue techniques
 - 4. Fire fighting apparatus and equipment
 - a. Apparatus
 - i. Design standards for new apparatus
 - ii. Licensing and certifications for vehicle operations
 - iii. Safety considerations when operating vehicles
 - b. Equipment

- c. Fire fighting devices
 - i. Fire extinguishers
 - ii. Hose lines
 - iii. Devices improvised in response to specific situations
 - d. Fire fighter personal protective equipment (PPE)
 - i. Reasons for wearing
 - ii. Reasons for failure of clothing
 - iii. Self-contained breathing apparatus (SCBA)
 - a) Air consumption
 - b) SCBA Emergencies
 - iv. Personal alarm safety system (PASS)
5. Safe and competent response
- a. Role of fire department organization
 - i. Policies and procedures
 - ii. Enforcement of training standards
 - b. Responding to emergency scenes
 - c. Handling emergency situations
 - i. Preplanning for emergencies
 - ii. Fire and health danger assessment
 - iii. Evacuating premises
 - iv. Emergency information reporting
 - d. Fire protection in open areas
 - i. Wildland
 - ii. Transportation
 - iii. Storage
 - e. Safety precautions
 - i. Structure fires
 - ii. Vehicle fires
 - iii. Wildland fires
 - iv. Violent incidents
 - v. All other emergency situations
 - f. Emerging technologies
6. Firefighter survival training
- a. Developing a survival attitude
 - i. Potential for serious injury and death
 - ii. Situational awareness
 - b. Mayday
 - i. Preventing a Mayday
 - a) Importance of thorough scene size-up
 - b) Preincident planning procedures
 - ii. Situations that create or may create a Mayday
 - iii. Mayday procedures
 - c. SCBA emergencies
 - i. NFPA 1404
 - a) Standard for fire service respiratory protection training
 - b) Individual air management program
 - ii. Air consumption for survival
 - a) Consumption rate testing
 - b) Reducing consumption
 - iii. Checking SCBA
 - a) Daily check
 - b) Emergency procedures check
 - iv. Common SCBA emergencies
 - v. Alternative means of obtaining additional air
7. Organizational health and safety profile
- a. Personal and organizational accountability

- b. Present condition/culture
- c. Investigations – internal
- d. Analyzing your profile
- e. Utilizing grants to meet needs
- 8. Risk management
 - a. Risk management concepts and practices
 - b. Unsafe acts
 - c. Empowerment definition
- 9. Prevention
 - a. Common fire and health hazards
 - i. Housekeeping
 - ii. Electrical
 - iii. Flammable gases and liquids
 - iv. Common hazardous substances
 - b. Fire detection devices for the home and/or workplace
 - i. Selection
 - ii. Operation
 - iii. Maintenance
 - c. Home fire sprinklers
 - d. Code enforcement
 - e. Public education / fire and life safety
 - i. Roles and responsibilities
 - ii. Principles of fire behavior
 - iii. Human behavior in fire
 - f. Counseling and psychological support

B. Laboratory:

- 1. Personal protective equipment
 - a. Don structure fire PPE
 - b. Don SCBA
- 2. Firefighter survival skills
 - a. Demonstrate how to read couplings using hands to follow hose toward exit
 - b. Demonstrate how to escape entanglement using the swim or sweep method
 - c. Demonstrate how to escape entanglement using the SCBA removal method
 - d. Demonstrate how to call a Mayday
 - e. Demonstrate how to perform personal procedures to assist in successful recovery
 - f. Demonstrate how to navigate the SCBA confidence course using survival skills when needed

VI. METHODS OF INSTRUCTION:

- A. Lecture
- B. Group discussion
- C. Audiovisual aids
- D. Simulated problem solving
- E. Online research assignments
- F. Practical field applications
- G. Performance examinations
- H. Field trips

VII. TYPICAL ASSIGNMENTS:

- A. Typical Assignments
 - 1. As a member of a research group, prepare and deliver a fire service safety resource contact presentation

2. Prepare a written analysis based on research of the 16 Firefighter Life Safety Initiatives
3. Demonstrate methods of escaping entanglement while wearing firefighter PPE

VIII. EVALUATION:

- A. Methods of evaluation
 1. Class attendance and participation
 2. Classroom exercises
 3. Homework assignments
 4. Quizzes
 5. Midterm examination
 6. Final examination
 7. Manipulative performance exercises
- B. Frequency
 1. Quizzes will be provided on a weekly basis
 2. Two TBA scheduled lab sessions to affect manipulative skills to be performed and evaluated
 3. Written Final at the end of the course.

IX. TYPICAL TEXTS:

- A. Essentials of Fire Fighting, 5th ed., IFSTA-Brady, Fire Protection Publications, 2008
- B. Fire Service Search and Rescue, 7th ed., IFSTA, Fire Protection Publications, 2005
- C. Fire Fighter Survival, California State Fire Training, 2010
- D. Fire Fighter Safety and Survival Workbook, Hurtado, Chabot College, 2010

X. OTHER MATERIALS REQUIRED OF STUDENTS:

- A. Turnout coat, pants, helmet, hood
- B. Safety gloves

Creation Date:

Revision Date: 3/11 (Las Positas College)

Date approved by Curriculum Committee:

Effective Date: Fall 2011

**Course Outline for Fire Technology 86
CAL FIRE BASIC FIREFIGHTER (2010)**

I. CATALOG DESCRIPTION:

FST 86 – CAL FIRE BASIC FIREFIGHTER (2010) - 5 units

Provides a basic structural and wildland firefighting course which is oriented toward entry-level employment opportunities within agencies responsible for Wildland Fire Mitigation and Interface I-Zone Fire Protection, with an emphasis on the equipment utilized on CAL FIRE Engines (formerly California Department of Forestry). Meets minimum employment requirements for seasonal employment with CAL Fire. The course is structured with a maximum emphasis on demonstration, student application and performance examinations. Fundamentals of wildland fire control and techniques of controlling other emergency incidents are covered with a strong safety perspective. Various live fire exercises are provided for application of fire control and suppression techniques. The course provides for S130, S131 and S190 equivalency under the National Wildfire Coordinating Group (NWCG). Through completed pre-requisite coursework, completion of the course including a completed CAL Fire "Firefighter Basic Training" Taskbook, the course meets the 2010 CAL Fire 179 Hour "CAL FIRE Basic Firefighter" certification requirements. Course complies with the State Board of Fire Services Wildland Fire Fighting requirements for Structural Firefighter I Certification. Prerequisite: Fire Service Technology 50 "Fire Protection Organizations" (completed with a grade of "C" or higher); Fire Service Technology 65 "First Responder Hazardous Materials / Incident Command ICS 200" (completed with a grade of "C" or higher) or equivalent certifications issued in Fire Service Technology 65 (Hazmat First Responder Operational Level, CSTI or FSTEP); PEFSC "Fire Science Conditioning and Agility Development; EMS 61 "Emergency Medical Responder" (Current certification through ASHI with current BLS Health Care Provider AHA, CPR Certification). 3 hours lecture, 6 hours laboratory.

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT:

May be repeated once if Fire Technology FST 86 was taken before Summer 2009

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering the course, the student should be able to:

FST 50

- A. identify the basic components of fire as chemical reaction, the major phases of fire, and the main factors that influence fire spread and behavior;
- B. identify the effects of fire on the environment and the historical efforts made to protect society;
- C. identify the major organizations that contribute to fire protection;
- D. define and describe the purpose and scope of fire departments;
- E. identify the types of common fire department apparatus, equipment, and personal safety equipment used for firefighting;
- F. identify the various types of public and private fire protection equipment and systems;
- G. define fire fighting strategy and tactics;
- H. describe the basic elements of firefighter safety and survival;
- I. define and describe cultural differences and diversity;

- J. define and identify discrimination and harassment laws and regulations.

FST 65

- A. utilize the various methods of identifying hazardous materials;
- B. describe the procedures for responding safely to Hazardous Materials Incidents
- C. initiate incident scene isolation and zoning;
- D. describe evacuation procedures;
- E. list and describe the various methods of containing hazardous materials;
- F. select the appropriate level of protective clothing;
- G. establish decontamination procedures;

PEFSC

- A. understand the importance of warm-ups and downs;
- B. proper lifting and carrying techniques with "Tools of the Trade";
- C. demonstrate proper cardio-respiratory control with use of an SCBA while under physical exertion;
- D. demonstrate appropriate techniques for "CPAT" and traditional "Physical Agility" testing requirements.

EMS 61

- A. explain how the Emergency Medical Services (EMS) system works and how the first responder's role in the EMS system differs from citizen responder's role;
- B. identify guidelines to follow to ensure personal safety and the safety of others at an emergency scene;
- C. identify ways in which diseases are transmitted and describe the universal safety precautions to prevent transmission;
- D. explain the four emergency action principles;
- E. recognize breathing emergencies, such as choking, and provide proper care for them;
- F. recognize life-threatening bleeding and demonstrate how to control it;
- G. recognize the signs and symptoms of a possible heart attack, and describe how to care for someone who is experiencing a persistent chest pain and/or other signs and symptoms of heart attack;
- H. recognize the signs and symptoms of cardiac arrest, and demonstrate how to provide cardiopulmonary resuscitation (CPR) for the infant, child and adult;
- I. recognize the signs and symptoms of shock, and describe how to minimize the effects of shock;
- J. recognize the signs and symptoms of medical emergencies, including poisoning, heat and cold emergencies, and stroke, and describe both general and specific care for medical emergencies;
- K. identify situations that require crisis intervention;
- L. identify the correct process for gaining access and moving patients;
- M. describe the process for managing multiple casualty incidents;
- N. recognize situations that require automated external defibrillation;

IV. MEASURABLE OBJECTIVES:

Upon completion of the course, the student should be able to:

- A. identify and describe the factors that influence wildland fire protection in California;
- B. explain the mission, organization, and code of conduct requirements for wildland fire operations;
- C. define basic Incident Command System (ICS) terminology, structure and facilities;
- D. describe logistical support operations under the state mutual aid system for access to local state and federal wildland fire resources;
- E. describe the station operations and firefighter preparedness for response to an emergency call;

- F. explain the physics and fire chemistry of wildland fire behavior;
- G. identify and describe the extinguishing agents and application methods for various fire situations;
- H. describe and demonstrate the proper methods for donning wildland personal protective equipment (PPE) Structural and Wildland, including self-contained breathing apparatus (SCBA);
- I. describe and demonstrate wildland firefighter safety principles;
- J. identify and describe the characteristics and function of each type of wildland fire apparatus;
- K. identify and describe fire operations and safety issues with firefighting aircraft and mobile ground equipment;
- L. describe and demonstrate proper utilization of wildland hand tools, power tools and equipment;
- M. demonstrate deployment of 16-foot and 20-foot ground ladder;
- N. demonstrate loading and deployment methods for wildland fire hose, appliances and tools;
- O. identify and describe vegetation suppression strategies;
- P. describe and demonstrate proper shelter deployment;
- Q. identify and describe structural suppression strategies;
- R. identify and describe suppression strategies for vehicle fires and boiling liquid expanding vapor explosions (BLEVE);
- S. identify and describe fire suppression challenges involving the wildland / urban interface;
- T. apply suppression techniques following all required safety practices under simulated and live fire conditions;
- U. demonstrate loading and deployment methods for structural fire hose, appliances and tools;
- V. demonstrate proper structure search and rescue safety precautions;
- W. describe proper structure protection and structure fire extinguishment techniques and tactics;
- X. identify different types building construction;
- Y. describe indicators of potential building collapse;
- Z. describe safety precautions when working around energized equipment.

V. CONTENT:

- A. Lecture
 - 1. Wildland fire protection organization in California
 - a. Wildland values and functions
 - b. Organization for wildland protection
 - c. Fire terminology
 - d. The fire problem in California - recent incident studies
 - e. Functions of the protection organization
 - i. The fire prevention problem
 - ii. Fire prevention planning
 - iii. Pre-suppression planning
 - f. Fire organization
 - i. Planning
 - ii. Fire line
 - iii. Support
 - 2. California Department of Forestry and Fire Protection (CAL FIRE) Mission and organization, culture of CAL FIRE
 - a. Code of Conduct
 - b. Working with California inmate fire crews
 - c. Introduction to Radio Communications
 - 3. Incident Command System (ICS)
 - a. ICS terminology and structure

- b. Resource types by ICS classification
- c. ICS facilities
 - i. Incident command post
 - ii. Staging areas
 - iii. Incident base
 - iv. Camps
 - v. Helibases and helispots
- 4. Logistical support
 - a. State and Federal agencies
 - b. Local, state and federal mutual aid
- 5. Response preparedness
 - a. Station operations
 - b. Wildland firefighter preparedness
 - c. Responding to an emergency call
- 6. Fire behavior
 - a. Chemistry
 - b. Fuel
 - c. Weather
 - d. Topography
- 7. Extinguishing agents and applications methods
 - a. Water
 - b. Foam, class "A" and class "B"
 - c. Fire Blocking Gels
 - d. Chemicals
 - e. CO2
 - f. Dirt
- 8. Personal protective equipment (PPE)
 - a. Wildland fire PPE
 - b. Structure fire PPE
 - c. Self-contained breathing apparatus (SCBA)
 - i. Types
 - ii. Components
 - d. Personal Alert Safety System (PASS)
- 9. Firefighter safety
 - a. Line organization
 - b. Personal needs
 - c. Medical concerns
 - d. Hydration
 - e. Snake bites and stings
 - f. Burns
 - g. Strains, Sprains
 - h. Heat exhaustion, heat stroke
 - i. Communication
 - j. LACES
 - i. Lookouts
 - ii. Awareness
 - iii. Communication(s)
 - iv. Escape route(s)
 - v. Safety zone(s)
 - k. 18 Watchouts
 - l. Ten Standard Fire Orders
 - m. Rapid Intervention Crews and Firefighter Survival
 - n. Fireline hazards
 - o. Structural hazards
 - p. Avoiding fire entrapment
 - q. Common denominators of fire fatalities

- r. Chainsaw safety
- s. Personal physical conditioning and strength
 - i. Importance and types of stretching and warm-up exercises
 - ii. Requirements of Pack Test
- 10. Apparatus types and capabilities
 - a. Federal and California classifications
 - b. Air operations, types of aircraft and facilities
 - i. Fixed wing
 - ii. Rotary wing
 - c. Mobile ground apparatus
 - i. Structure engine
 - ii. Brush truck
 - iii. Mobile water shuttle
 - iv. CAL Fire apparatus types
 - d. Heavy equipment
 - i. Dozers
 - ii. Tenders
 - iii. Fire Blocking Gel Trucks
- 11. Apparatus safety
 - a. Safety considerations when working around dozers
 - b. Safety considerations when working near aircraft
- 12. CAL Fire Wildland Firefighter Safety and Survival Level I
- 13. Wildland Equipment
 - a. Hand and power tools
 - b. Fire extinguishers
 - c. Communication
 - d. Traffic control devices and signals
 - e. Records
 - f. Backfiring equipment
 - i. Drip torch
 - ii. Back pumps
 - iii. Fusees
 - iv. Flare launcher (gun)
 - v. Hand thrown flares
 - vi. Terra torch
 - g. Maps
 - i. Map reading
 - ii. GPS
 - iii. Compass utilization
- 14. Ground ladders
 - a. Terminology
 - b. Safety practices
- 15. Fire Hose, appliances and tools
 - a. Terminology
 - b. Types of loads and lays
 - c. Types of nozzles
- 16. Vegetation fires
 - a. Wildland firefighting terminology
 - b. Parts of a wildland fire
 - c. Wildland fire strategy
 - i. Response
 - ii. Size-up
 - iii. Rescue
 - iv. Exposure
 - v. Cutting line
 - d. Attack methods

- i. Progressive hose lays
 - ii. Mobile attack operations
 - iii. Handline construction
 - e. Mop-up and patrol
 - 17. Structure fires
 - a. Effects of structures endangered
 - b. Strategies
 - c. Tactics
 - d. Two in – two out rule
 - e. Confinement
 - f. Extinguishment
 - g. Overhaul
 - h. Salvage
 - i. Basic Building Construction Types
 - j. Building collapse indicators
 - k. Rapid Intervention Crew
 - l. Breaching and cutting tools
 - 18. Special fires
 - a. Vehicle fires
 - b. Boiling Liquid Expanding Vapor Explosion (BLEVE), propane vessels
 - c. Response strategies
 - 19. Urban interface hazards
 - a. Triage of structures
 - b. Safety considerations
 - c. Structure protection guidelines
 - d. Basic forcible entry techniques
 - 20. Fire shelters
 - a. Characteristics and functions (new generation)
 - b. Shelter deployment

B. Laboratory

- 1. Personal protective equipment
 - a. Don wildland fire PPE
 - b. Don/Doff SCBA (MSA Firehawk Stealth with PASS)
 - i. Coat method
 - ii. Seat-mount method
 - iii. Over-the head method
 - c. Demonstrate inspection, cleaning and sanitizing SCBA
 - d. Utilize SCBA under physical exertion (stair climb)
 - e. Utilize SCBA during performance of search techniques and structural firefighting applications
- 2. Firefighter safety
 - a. Perform daily PT and physical fitness training
 - i. Stretching and warm-up exercises
 - ii. Conditioning run 1 to 2 miles
 - b. Perform pack test, 45 lb vest, 3 miles in 45 minutes (walking only)
 - c. Deploy a canister style fire blanket
 - d. Demonstrate how to use a one-person side pull fire curtain
 - e. Demonstrate how to use the one piece roll down fire curtain
 - f. Demonstrate how to use the two piece fire curtain
 - g. Deploy fire shelter within the cab
 - h. Deploy the new generation fire shelter – standing, sitting, lying down, exiting a cab
 - i. Perform shelter deployments in both static and dynamic conditions
 - j. Demonstrate how to assume the safety position for an air tanker or rotary aircraft drop
- 3. Tools and equipment for Wildland and Structure Firefighting

- a. Operate and maintain chain saw
 - b. Operate a back pump (pump pack)
 - c. Operate a floto pump
 - d. Utilize maintain, assorted wildland hand tools
 - i. Shovels, round tip, square point, scoop
 - ii. Mcleod
 - iii. Polaski
 - iv. Brush hook
 - v. Fire swatter
 - vi. Fire rake
 - vii. Wire broom
 - viii. Rhino tool
 - ix. Combi tool
 - x. Axes, single bit, double bit, pick-head
 - e. Cut line in brush, grass, includes cup trench technique, perform downhill fireline construction
 - f. Utilize maintain forcible entry tools
 - i. Halligan bar
 - ii. Chicago door opener
 - iii. Flathead axe
 - iv. 6lb sledge hammer
 - g. Utilize maintain pike pole, ceiling hook, rubbish hook
4. Fire Hose, appliances and tools
- a. Demonstrate hose coupling
 - i. Over the hip single person
 - ii. Two person
 - iii. Tight coupling-knee press, single person
 - iv. Tight coupling-stiff arm, two person
 - b. Bed and deploy a triple layer 2½" hose load
 - c. Demonstrate various hose rolls; straight-in service and out of service, donut, twin donut, and use of commercial hose roller
 - d. Demonstrate basic flat load and accordion load for hose
 - e. Advance a progressive hoselay
 - i. Three person method
 - ii. One method (300 feet) method
 - f. Carry hose from hose bed – one shoulder carry method
 - g. Pick up and drain hose
 - i. Accordion shoulder carry method – one person
 - ii. Butterfly method – one person
 - h. Structure protection pre-connected hose loads and deployment 1¾" Hose, minuteman load and standard flat load
 - i. Identify and use basic hose, couplings, related hose adaptors and appliances
 - j. Perform maintenance of hose, couplings and related tools and appliances for hose lines
5. Mobile equipment
- a. Demonstrate backing hand signals
 - b. Demonstrate use of floto-pumps and make hydrant connections, identify water resources
6. Ground ladders
- a. Carry, raise, extend and place the 16-foot (single person) and 24 foot (2 person) ladder to a structure
 - b. Retract, lower and return the 16-foot (single person) and 24 foot (2 person) ladder to the apparatus
7. Specialized Equipment

- a. Demonstration and orientation to Water Tenders, Helitack Operations, Dozers
- b. Observe Bambi Bucket deployment
8. Vegetation live fire exercises
 - a. Perform a mobile fire attack; Flanking, Parallel, Tandem, Pincer, Bump and Run
 - b. Demonstrate mop-up and patrol
 - c. Perform attack methods with hand tools and pump packs
 - d. Perform progressive hose lay operations
 - e. Perform line and strip firing
9. Live fire exercises (non vegetation)
 - a. Utilize portable fire extinguishers, CO2, dry-chem (multi-purpose), water with burn pan
 - b. Ignite and extinguish signaling flares (road flares), wildland fusees
 - c. Ignite and utilize a drip torch

VI. METHODS OF INSTRUCTION:

- A. Lecture
- B. Group discussion
- C. Audiovisual aids
- D. Simulated problem solving
- E. Incident action planning
- F. Reading assignments
- G. Practical field applications
- H. Manipulative drills
- I. Controlled live fire exercises
- J. Performance examinations

VII. TYPICAL ASSIGNMENTS:

- A. Complete the following on-line courses: S-110 "Basic Wildland" Suppression Orientation" (2003, S-130 "Firefighter Training" (2003), and the S-190 "Introduction to Wildland Fire Behavior (2006) through NWCG Training.
- B. Develop wildland interface scenario through oral evaluation during lab assignments and describe the procedures towards conducting size up, containment, extinguishment and overhaul.
- C. Demonstrate in field exercises the proper use of tools and equipment.
- D. Demonstrate proper use of Safety Equipment under various exercises, identifying escape routes, safety zones and demonstrating proper shelter deployment techniques.
- E. Demonstrate proper extinguishment methods using available means and equipment under controlled live fire applications.
- F. Read assignments of course text and review of course handouts and classroom notes.
- G. Maintain Task Book assigned, in which all components of all required manipulative- psychomotor skills and cognitive knowledge instruction will be recorded as successfully completed during all lecture and lab sessions of training.

VIII. EVALUATION:

- A. Methods
 1. Satisfactory completion of CAL FIRE Basic Firefighter Taskbook
 2. Quizzes (written and oral)
 3. Successful completion of all manipulative performance standards
 4. Final state written examination
- B. Frequency
 1. CAL FIRE Basic Firefighter Taskbook - ongoing assessment during lecture and lab sections of course delivery

2. Daily Quizzes
3. Specific skills performance tests (psychomotor testing) at end of course
4. Final state written exam on last day of class

IX. TYPICAL TEXTS:

- A. Wildland Fire Fighting Practices, Joseph D. Lowe, Delmar (2001)
- B. Wildland Fire Fighting for Structural Firefighters, IFSTA 4th Edition (2003)
- C. Essentials of Firefighting and Fire Department Operations. IFSTA 5th Edition, Brady 2008
- D. Fireline Handbook, National Wildfire Coordinating Group, 2004

X. OTHER MATERIALS REQUIRED OF STUDENTS:

- A. Wildland firefighting gloves, NFPA and ANSI Approved
- B. Wildland firefighting boots, NFPA and ANSI approved
- C. Uniform Pant, Black 100% Cotton or Nomex
- D. Black Leather (Basket Weave) 1¾", Belt with Silver Buckle
- E. LPC FST T-Shirt and LPC FST Ball Cap

Creation Date: 1993

Revision Date: 3/93; 9/99 (Chabot College)
11/99 (Las Positas College)
2/08 (Las Positas College)
3/11 (Las Positas College)

Date approved by Curriculum Committee:

Effective Date: Summer 2011



20 Corporate Circle
 Albany, NY 12203
 Ph. 518-689-2023
 Fx. 518-689-2034

Quote

Quote Number: 16503
 Date: 2/11/2010
 Sales Person: Kristen Thatcher
 Valid Until: 3/11/2010
 Terms: Net 30

Bill To:	Ship To:	Contact:
Las Positas Community College 3000 Campus Hill Dr. Livermore CA 94551 USA	Las Positas Community College 3000 Campus Hill Dr. Livermore CA 94551 USA	Ron Johansen 925-424-1177

Quantity	Part Number	Product	Unit Price	Ext. Price
1		Smoke Generator 6000 Industrial Grade Fire Fighter Training Smoke Generator On-board smart controls including continuous run, time delay, and density settings 110V 20 Amp 6000 cubic feet/min to zero visibility 5 liter smoke liquid reservoir Includes 1 liter starter pack of BullEx smoke liquid	\$3,875.00	\$3,875.00
1		BullEx Smoke Liquid 5L 5 liter container of BullEx Smoke Liquid. Specially formulated water-based smoke liquid for use in the BullEx Smoke Generator 4000 or 6000.	\$60.00	\$60.00

Grand Total		Subtotal:	\$3,935.00
Currency:	U.S. Dollar	Tax:	\$0.00
Tax Rate:	0.00%	Shipping & Handling:	\$146.38
Shipping Provider:		Total:	\$4,081.38

Warranty Terms: The warranty covers all defects in material or workmanship for a period of one year from date of purchase unless otherwise specified. The warranty does not cover damage caused by accident, neglect, or misuse by the client or its agents, servants or employees. Standard warranty excludes batteries and battery packs which have a 90 day warranty.

Payment Terms: A penalty of 1.5% per month will be charged on any invoices not paid within 30 days. Customers are responsible for all duties, taxes, and customs charges. All payments must be in US Dollars. BullEx Inc. is not responsible for any currency exchange differences. All orders will be invoiced and/or charged on the day in which the order is shipped. Terms on BullEx, Inc. quotes supersede any terms and conditions on a customer purchase order. Customer agrees to fully comply with U.S. Export Administration Regulations and all other U.S. laws and regulations concerning exports and re-exports to foreign countries.

SMOKE GENERATORS FOR FIRE TRAINING

TOUGH TOOLS FOR SERIOUS TRAINING

BullEx Smoke Generators use smart controls to continuously produce the best smoke possible for fire and emergency services training.

Built on steel chassis with all metal structural components, these smoke generators are built to handle the toughest training demands.

BullEx Smoke Liquid was specifically developed to produce a dense, thick smoke with an extended hang-time. Advanced sensors and controls enable BullEx Smoke Generators to produce a continuous supply of smoke without recharging or reheating.

Whether you are doing search and rescue, ventilation or initial fire attack drills, BullEx Smoke Generators don't stop until your training is done.

SMOKE GENERATOR

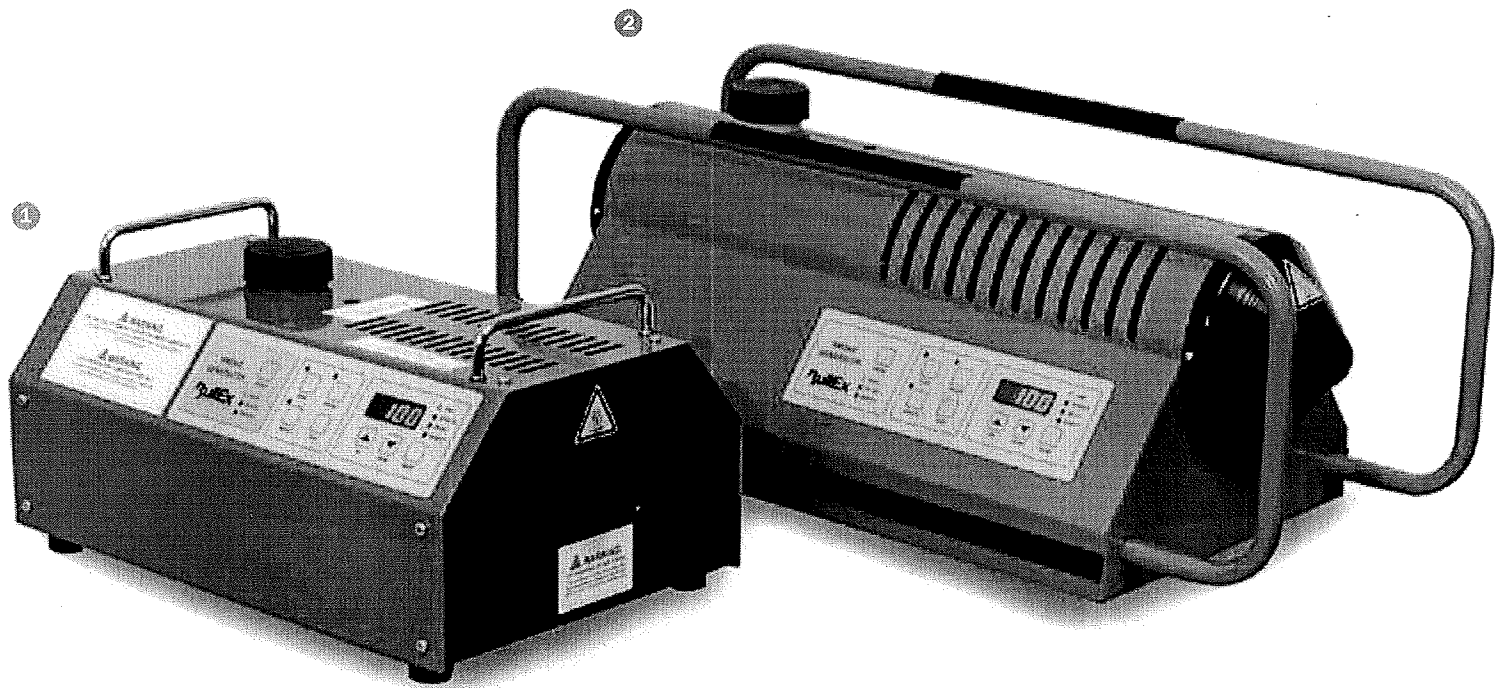


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1 Smoke Generator 4000 2 Smoke Generator 6000

SMOKE GENERATOR 4000

With built-in handles, steel chassis and rubberized feet, the Smoke Generator 4000 is portable enough to be easily moved, but tough enough to handle the demands of firefighter training. Smart controls and an integrated smoke liquid tank enable the SG4000 to produce smoke continuously for hours.

• SPECIFICATIONS

- 110V, 1750 watts
- 14.5 amps
- 4,000 ft³/min to zero visibility
- 3 liters/hr
- 12.5" W x 19.25" L x 7.5" H
- 45 lbs.

SMOKE GENERATOR 6000

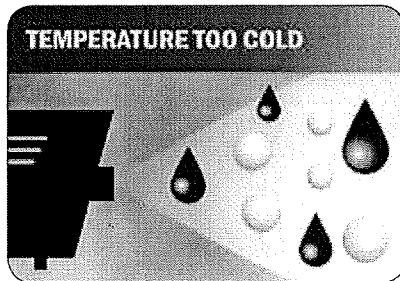
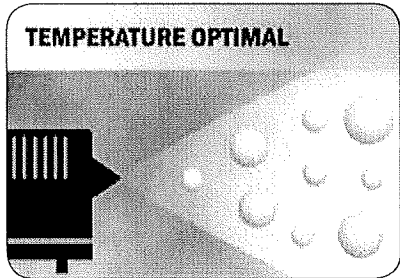
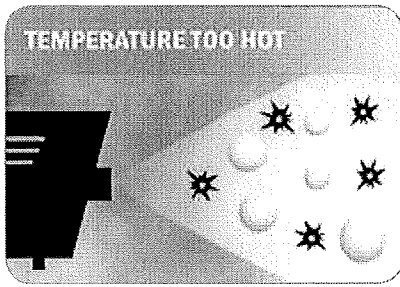
The BullEx Smoke Generator 6000 is a heavy-duty, high-volume Smoke Generator for the most demanding training scenarios. Dual heaters and a specialized heat-exchanger ensure efficient smoke production on a large-scale. With integrated handles and built-in wheels the SG6000 can easily be repositioned in between evolutions.

• SPECIFICATIONS

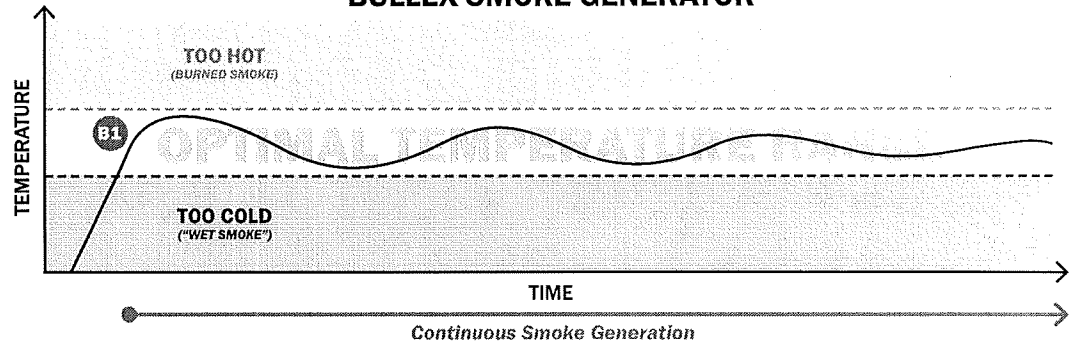
- 110V, 2200 watts
- 20 amps
- 6,000 ft³/min to zero visibility
- 4.7 liters/hr
- 13.5" W x 31.25" L x 13" H
- 70 lbs.

TRAINING OPPORTUNITIES

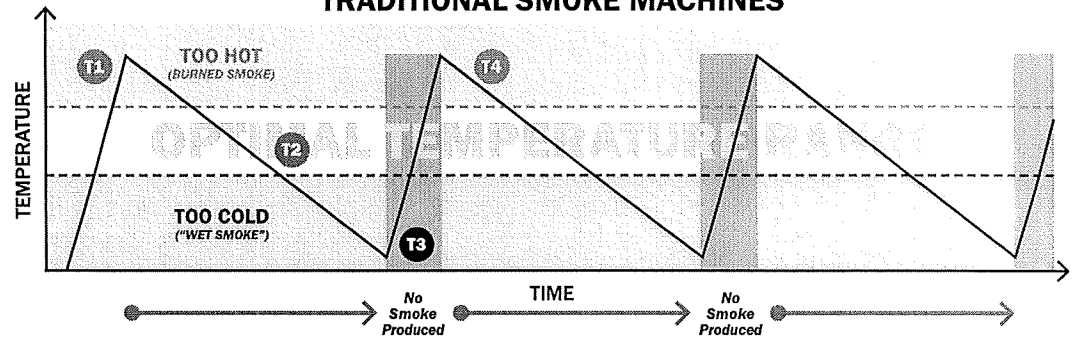
- The high volume of continuous smoke is ideal for horizontal or vertical ventilation drills and helps show the effects of Positive Pressure Ventilation.
- Challenge firefighters to find victims in low-visibility during search and rescue or thermal imaging drills.
- Quickly fill buildings with dense smoke for large area search drills.
- Create a zero visibility environment in seconds for mask confidence training.



BULLEX SMOKE GENERATOR



TRADITIONAL SMOKE MACHINES



BULLEX SMOKE GENERATORS generate a high quality, dense, uniform, “dry” smoke that does not leave a residue through the use of advanced controls and a specific smoke liquid formula. Heaters and liquid pumps are controlled by on-board electronics to precisely bring the smoke liquid to the right temperature, ensuring a continuous supply of high quality smoke.

TRADITIONAL SMOKE MACHINES

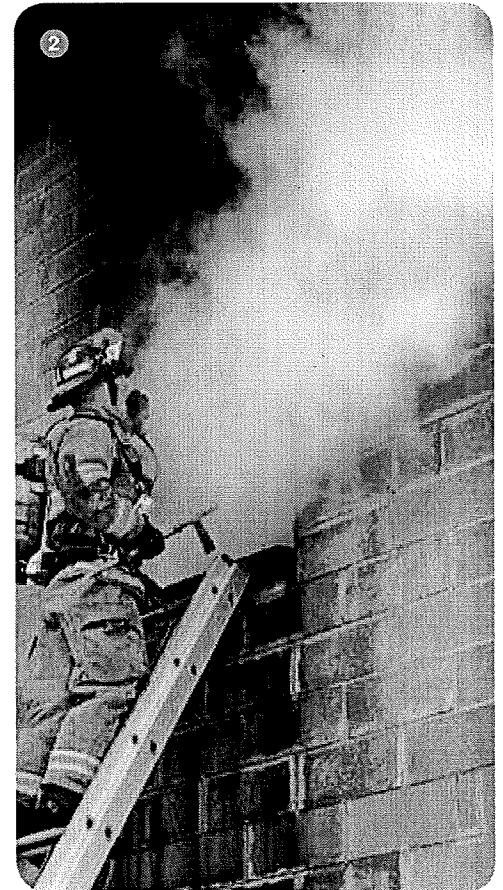
All smoke machines create smoke by pumping smoke liquid through heaters. As heat energy is transferred from the heaters to the smoke liquid, the heaters inevitably cool down. Once below a certain temperature smoke can no longer be generated, which is why smoke machines not designed for fire training need time to reheat and recharge between discharges. To extend operating time, these smoke machines often start at a higher-than optimal temperature, resulting in burnt particles. As smoke is generated, the heater temperature falls through the optimal range to below optimal resulting in “wet” smoke that leaves a residue. The smoke liquid is then cut off to give the heaters time to recover.

BULLEX SMOKE GENERATORS

BullEx Smoke Generators are different. Instead of a constant flow of smoke liquid and a wide range of heater temperatures, BullEx Smoke Generators control the amount of liquid delivered to the heaters to precisely balance the heat transfer, ensuring a constant temperature and a constant supply of high quality smoke. This balance is achieved through advanced sensors and controls utilized by BullEx Smoke Generators. This technology not only provides a **continuous** supply of smoke, but also ensures the highest quality smoke possible with minimal burnt or un-vaporized particles.

BULLEX SMOKE GENERATOR VS. TRADITIONAL SMOKE MACHINES

- B1** THE BULLEX SMOKE GENERATOR reaches operating temperature. The Smoke Liquid flow is balanced with heater temperature to achieve Continuous Smoke Generation in the optimal temperature range.
- T1** THE TRADITIONAL SMOKE MACHINE begins making smoke when the heater temperature reaches the maximum setting.
- T2** The smoke liquid is pumped at a constant rate, gradually reducing the heater temperature.
- T3** The traditional smoke machine temperature is too low to produce smoke. Liquid flow is stopped until the heaters reach the maximum temperature setting.
- T4** Maximum heater temperature setting is reached. Liquid flow and smoke production resumes.



1 High volume smoke production 2 Horizontal ventilation training 3 Ventilation drill with one SmokeGenerator 4000

ACCESSORIES

- **REMOTE CONTROL** — add the remote control to operate either Smoke Generator from a distance.
- **FLEXIBLE SMOKE DUCT SET** — duct smoke to specific areas with the 20' flexible smoke duct.

SMOKE LIQUID

BullEx Smoke Liquid was developed to efficiently produce dense, thick smoke with an extended hang-time. This is accomplished by optimizing the formulation of the smoke liquid specifically for use in BullEx Smoke Generators.

- Available in 5, 10 and 20 liter containers.

