

**CALIFORNIA DEPARTMENT OF  
FORESTRY & FIRE PROTECTION**

**OFFICE OF THE STATE FIRE  
MARSHAL**

**ACCELERANT DETECTION  
CANINE TEAM STANDARDS**

**JUNE 2009**

## PREFACE

I am pleased to present this Accelerant Detection Canine Standard, and believe this to be the first State-adopted standard covering this important fire investigation topic.

In 2008 the Office of the State Fire Marshal established an Accelerant Detection Canine Standard (ADCS) Taskforce to develop a state standard for canine handlers. and to provide clear leadership for the fire service and law enforcement agencies in our state. It was designed with two key objectives in mind:

- To provide guidance to those agencies that want to establish a high performance Accelerant Detection Canine program, and
- To establish an acceptable standard that would ensure a high level of credibility for the Accelerant Canine Detection handler when testifying in court.

I want to thank The California State Firefighters' Association (CSFA) for their assistance with this project. CSFA had established a similar taskforce and had done significant research on the topic. Both the Office of the State Fire Marshal and CSFA joined forces to help produce this standard.

The process for developing this standard included several statewide meetings for stakeholders and interested parties to give their input on this important subject. In addition to the Accelerant Detection Canine handlers, drug and bomb dog handlers from within the State of California were consulted for input. We also sought expert input from highly trained and experienced fire investigators.

The California Office of the State Fire Marshal believes that the following standard meets or exceeds the expectations of NFPA 921.

*Kate Dargan*, State Fire Marshal

# **California Office of the State Fire Marshal Accelerant Detection Canine Standards**

## **Goals and Objectives**

Keeping in mind the vital role that Accelerant Detection Canines serve in the investigation of fires, and the role they play in counter-terrorism efforts, it is the goal of the California Office of the State Fire Marshal to:

Provide a set of standards that will ensure the credibility of Accelerant Detection Canine Teams used in the State of California.

The objectives are as follows:

The California Office of the State Fire Marshal (OSFM) will compile standards from recognized Canine groups such as North American Police Work Dog Association, Canine Accelerant Detection Association, The U.S. Department of Justice, Bureau of Alcohol, Tobacco, Firearms and Explosives, Canine Branch, the California Narcotics K-9 Association, Scientific Working Group on Dog and Orthogonal Detector Guidelines and the California State Firefighters' Association Canine Standards Committee.

- Define Accelerant Detection Canine Team
- Provide guidelines for establishing an Accelerant Detection Canine program
- Provide guidelines that deal with the overall handling, deployment and care of the canine as they relate to training, health, and evidentiary issues
- Design a standardized certification test for Accelerant Detection Canine Teams

## **Definition of Accelerant Detection Canine**

To be classified as an “accelerant detection canine” the canine must be trained to detect the presence of ignitable liquids as listed with the American Standards and Testing Materials (ASTME 14121-00 and ASTME 1618-01). Examples may include but not be limited to the following types of ignitable liquids or residues:

- Gasoline
- Diesel
- Kerosene
- Charcoal lighter fluid
- Paint thinner
- Naphthenic-Paraffinic
- Gasohol
- Lacquer thinner
- Paint remover
- Jet fuel
- Lamp oil
- Turpentine
- Methyl Ethyl Ketone (MEK)
- Camp fuel

## **Standards for the Selection of Accelerant Detection Canine Handlers**

It is highly recommended that an Accelerant Detection Canine handler should have a minimum of three years experience with fire investigation responsibilities. In addition, they shall have successfully completed the California Office of the State Fire Marshal fire investigation courses, (1A) (1B) (2A) (2B), as well as PC 832 Laws of Arrest or a basic POST Academy.

**Background: Accelerant Detection Canines are a tool used in the investigation of fires. A handler must be able to not only handle the canine but analyze fire patterns that are discovered in fire scenes. The above experience and training is essential to canine handlers, enabling them to interpret the canine's actions and what the fire scene is revealing.**

The handler must also display the following:

1. Good communication skills
2. Maturity
3. Flexibility
4. Dependability
5. Emotional stability
6. Enthusiasm
7. Good physical condition
8. Understanding of canines
9. Family should be agreeable to canine
10. Physical home environment that is canine friendly

**Background: An Accelerant Detection Canine handler must possess the communication skills to effectively communicate with outside government agencies, the legal community and the general public. An Accelerant Detection Canine handler must be in good physical condition necessitated by the demands placed on them. They must be able to work long hours in sometimes demanding situations. The handler's home must be canine friendly and the handler's family must be receptive to the canine coming into the home. Due to the nature of the job, the handler may be called out at any hour of the day or night including weekends and holidays.**

**The handler and his/her family must be willing to accept the demands of the position.**

When considering establishing an Accelerant Detection Canine Program, an agency should consider the frequency of use of the canine and the cost associated with establishing such a program. The agency must understand and be willing to comply with all Fair Labor and Standards Act as it pertains to canine handlers.

**Background: To maintain the proficiency of an Accelerant Detection Canine a team should be able to search a minimum of one fire scene per week. This may be accomplished through documented training sessions. Fire scene searches differ from any other type of crime scene searches, since odors that are produced by the fire directly affect the Accelerant Detection Canine. There are established Fair Labor and Standard Act sections in place that cover canine handlers.**

## **Maintenance and Training of Accelerant Detection Canines**

Accelerant Detection Canine health and first-aid must be a priority. The Accelerant Detection Canine must have a minimum of one complete physical examination a year. The handler, as part of the initial Accelerant Detection Canine training, should receive extensive instruction on canine first-aid. Recertifying agencies should also provide refresher/update training in canine first-aid.

**Background: Accelerant Detection Canines work in very dangerous conditions that differ greatly from environments that most others canines work in. The chemicals the canines come in contact with could be harmful to them. In addition, the canines can injure themselves from falls, cuts or other dangers found in fire scenes. A handler must be able to provide immediate first-aid to an injured canine in the field until the canine can be examined and treated by an appropriate emergency animal care facility.**

The Accelerant Detection Canine handler must utilize acceptable training methods in order to maintain the proficiency of the canine. These training methods will be ones accepted by nationally recognized certifying agencies. In addition to ignitable odor recognition, the canine must be able to discriminate between actual ignitable odors and similar odors that are generated by fuels burning in the fire scene. No two fire scenes are the same and each scene has its own unique challenges. The handler must be able to recognize the required courses of action for each situation and be able to adapt to them accordingly. This is accomplished by the proper training methods.

**Background: In today's environment, a vast majority of our products are manufactured using hydrocarbon materials. Proper training methods will minimize, if not eliminate the canine's false alerting to odors being produced by these materials being burned. If the handler is not trained and is unable to recognize the difficult problems associated with fire scene investigations, the effectiveness of the canine is diminished and the fire investigation can be compromised.**

Training documentation must be maintained for all training conducted by the Accelerant Detection Canine Team. The records shall be maintained by the agency and shall include documentation of scene work as well as training done on a day-to-day basis. The United States canine industry standard is a minimum of 16 hours per month per K-9 team (dog and handler).

**Background: It is imperative that all canine training be documented in detail and that complete records are maintained by the department. These training records may be utilized in all levels of court proceedings and can be introduced as evidence in both criminal and civil trials.**

## Criteria for Fire Scene Searches

All Constitutional issues should be addressed prior to utilizing an Accelerant Detection Canine Team for any search.

**Background: The Accelerant Detection Canine handler must be certain that he/she has a Constitutional right to search the fire scene. The handler will determine whether a search warrant or consent to search waiver has been obtained, or if there is justification to search because of exigent circumstances.**

To avoid any contamination issues, the canine should be bathed after every deployment. In addition, the compartment in the vehicle where the canine is transported should be cleaned after returning from each deployment.

**Background: Although the contamination of a fire scene by an Accelerant Detection Canine is very remote, every possibility of contamination should be eliminated if possible. The canine is a tool, and like any other tool that is used in the fire scene, it must be decontaminated after each use.**

It is the responsibility of the canine handler to insure that the scene is safe prior to deployment of the canine.

**Background: Fire scenes can be very dangerous not only to humans but also to the canine. A scene safety inspection should be conducted prior to deployment to minimize any injuries to the canine that may come from chemicals, unstable structures, glass, jagged objects, etc.**

The Accelerant Detection Canine should be calibrated by the handler prior to every entry into and every exit from area of deployment. The accelerant used for calibration should be varied.

**Background: Calibration of any tool lends itself to proficiency. Calibrating the canine prior to entry and after exiting the fire scene will help determine if there are any issues with the canine. The results of the calibration should be noted on every incident report.**

Fire scene searches by an Accelerant Detection Canine should be conducted in a systematic deployment using the methodologies established by recognized Accelerant Detection Canine certifying agencies.

**Background:** The Accelerant Detection Canine handler and canine are subject to scrutiny by the courts. In order to maintain the integrity of the Accelerant Detection Canine program, the handler must follow the training methods that were taught by the canine's original certifying agency. As there may be legitimate times when the handler may have to vary from the training methods, the handler must document this in the incident report.

Evidence collection resulting from an Accelerant Detection Canine alert must be verified using the acceptable procedures established by the State of California.

**Background:** The mere fact that an Accelerant Detection Canine alerts does not irrefutably conclude that an ignitable liquid was present. A sample must be collected and sent to a laboratory for verification.

## Canine Team Certification

*The Accelerant Detection Canine Team shall be initially certified and then re-certified annually. Such certification shall be administered by a reputable professional organization, government agency, or canine training facility.*

**Background: Using Accelerant Detection Canines that are certified by a recognized organization will reduce liability issues and increase the integrity of the Accelerant Detection Canine Program.**

Certification will be administered in a two-phase process. **Phase One** will consist of an Odor Recognition Test, and **Phase Two** will consist of a number of practical exercises. Both phases must be completed successfully before certification will be awarded to a canine team.

### Preparation of Ignitable Liquid Accelerants for Team Testing

A. Burnt materials: various materials (clothing, carpet, hardwood, upholstery, etc.) can be contaminated with a minimum of two ounces and not more than eight ounces of raw ignitable liquid accelerants from any of the following accelerant classifications:

1. Gasoline
2. Petroleum Distillates
3. Isoparaffinic Products
4. Aromatic Products
5. Naphthenic-Paraffinic Products
6. Normal Alkane Products
7. De-aromatized Distillates
8. Oxygenated Solvents

The selected liquid is poured over the material or area, ignited and allowed to burn at least one minute or unrestricted until out, depending on the material chosen.

B. Target sources and objects: Raw ignitable liquid from any of the above ignitable liquid classifications may be added to any area or object. A minimum of 20 micro liters must be utilized (no maximum) and will be in place before the start of the search for a minimum of twenty minutes.

## **Phase One – Ignitable Liquid Accelerant Odor Recognition**

### **I. Test Set up**

- A. The test shall consist of a minimum of 10 cans
- B. Cans will be a one-quart can with a punched lid set inside a gallon can with no lid
- C. Substrates will be burned and unburned. Examples of substrated materials may include but not limited to fresh laundered towels, new unfinished Douglas fire wood and clean carpet squares
- D. A maximum of five substrates will contain water at the discretion of the evaluator.
- E. At least one liquid accelerant from each of the classifications will be used on the test.
- F. At least three cans shall be blanks
- G. Each liquid will be presented once
- H. A maximum of five distracters containing food items may be used at the discretion of the evaluator

### **II. Test Administration**

- A. Cans may be set up in any configuration as determined by the evaluator
- B. At least one ignitable liquid from each classification will be present at 20 micro liters ( $\mu\text{L}$ ); gasoline will be present at 10 micro liters ( $\mu\text{L}$ )
- C. Cans will be labeled in a manner so as to not identify the classification and product name of the contents. The evaluator will have a complete list of all products and their location.
- D. Each canine team will have an adequate amount of time to complete the test as determined by the evaluator.

E. The canine teams may search the cans as many times as deemed necessary by the handler during the allotted time frame.

F. The handler determines when to call the test complete.

G. In order to successfully pass the test, the canine must give indication of recognition of each odor present.

H. If an odor was missed, the handler will be told which odor was missed at the completion of the exercise.

### **III. Re-Test Administration**

A. A series of 10 cans shall be used for each odor missed. The missed odor will be the only odor present in the series of cans. If a double odor (two successive cans) was missed, a double odor will be present.

### **Phase Two – Accelerant Detection Canine Practical Exercise Testing**

#### **I. Search Exercises**

A. All canines must have successfully completed Phase One testing which includes selected ignitable liquids from the ASTM Standards before attempting Phase Two.

B. At least four of the six types of searches (in the following list) must be offered and completed successfully.

C. Ignitable liquid accelerants used in Phase Two testing are selected by the evaluator and a minimum of one odor per area is required with the maximum determined by the size and type of area used.

D. During the exercise, the evaluator will take all necessary precautions to insure that no handler has any prior knowledge as to the location of training aids. In the event of a “miss”, the evaluator has the option of providing information to the handler as to the location of the training aid at the conclusion of the exercise.

E. In order to pass the test, the canine team can have no more than one miss in all areas. A “miss” is defined as “Any situation in which a team fails to

locate an ignitable liquid”. In the event of a miss, the team will be allowed to search the exact location of the find to determine the reason for the miss. Following this search, the evaluator will determine the reason for the miss, be it handler or dog error, and advise the team accordingly.

F. The team also can have no more than one false indication during the test. A “false indication” is defined as indication behaviors displayed by the dog in the absence of any odor accompanied by handler concurrence. In the event of a false indication, the evaluator will determine the reason for the false indication, be it handler or dog error and advise the team accordingly.

## **II. Types of Searches**

### **A. Indoor Search – Interior Rooms – Fire Scenes**

1. The total indoor search area will be a minimum of 1000 square feet. A formula of one-and-one-half (1.5) minutes per 100 square feet of room size will be used to establish adequate search time. Large areas can be sectioned off to the minimum of 1,000 square feet.
2. The evaluator will determine the number of target sources or objects based on the size and type of area used. The aids may be placed anywhere from a height of four feet to a depth of three inches under debris or ash. The number of target sources or objects utilized should be limited to not more than two within a 400 square foot area or room.
3. When possible, a negative (blank) room should be provided.
4. An Accelerant Detection Canine shall search through the area prior to the aids being placed to ensure that no ignitable liquid odors are present in the search area.

### **B. Vehicle Search**

1. A minimum of five passenger-size vehicles or at least three large-size vehicles (buses, trucks, etc.) of any type can be used for the search.

2. The order and spacing of the vehicles will be determined to permit easy access by the canine team.

3. The ignitable liquid accelerant may be placed either inside or outside the vehicle. No two target sources will be on the same vehicle. The vehicles may be either burned or unburned. Areas of vehicles selected for placement of ignitable liquids should not be areas of potential contamination (engine, fuel tank, etc) and care should be taken not to place vehicles in areas where gross contamination may exist (impound lots, etc.)

4. The proctor will determine a reasonable amount of time to complete the search.

### **C. Open Area Search**

1. The search area will be at a minimum 30 feet by 30 feet, and at a maximum 100 yards by 100 yards consisting of any surface available (grass or other vegetation, pavement, gravel, building exterior, etc.) The target sources will be placed in this area.

2. The target sources can be poured into the area or into containers or a combination of both. If pours are used, at least ¼ cup of ignitable liquid will be utilized. If containers are used, five containers of at least 6-ounce capacity size will be utilized. Containers can be the same type or various shapes or material.

3. Hot containers will be contaminated with an ignitable liquid. The contamination will consist of filling the one container with one ounce of an ignitable liquid and then pouring the liquid out – trace liquid will be left.

4. The open area search may include building exteriors.

5. The proctor will determine a reasonable amount of time to complete the search

#### **D. Crowd Search**

1. This search will consist of the searching for contaminated skin or clothing worn by the subjects of a search. At least six individuals will be utilized. The determination will be made depending on the circumstances and practicality.
2. A skin area or an article of clothing/footwear on an individual will be contaminated with a liquid accelerant. A minimum of 20 micro liters of a liquid accelerant will be used.
3. The proctor will determine a reasonable amount of time to complete the search.

#### **E. Clothing**

1. This search will consist of the searching for accelerant contaminated clothing. At least ten articles of clothing or ten piles of clothing will be utilized. Clothing shall be placed a minimum of three feet apart.
2. An article of clothing will be contaminated with an ignitable liquid. A minimum of two drops, maximum of two ounces of an ignitable liquid will be used.
3. The proctor will determine a reasonable amount of time to complete the search.

#### **F. Pinpoint Drill**

1. This search will consist of the searching for a small amount of ignitable liquid usually placed onto a clean substrate such as a small carpet square (2'x2') or a similar size section of wood or cardboard; a concrete square can also be used.
2. The objective of the exercise is to use the canine to pinpoint the exact location of an ignitable liquid on the substrate. The location of the dog's indication and the distance from the actual known location of the ignitable liquid are measured and recorded. The handler will mark the location of the dog's indication. The determination will be

made depending on the circumstances and practicality as to whether or not the indication is accurate.

3. No more than 20 micro liters (20  $\mu$ L) of an ignitable liquid will be used, except for 50% gasoline in which case 10  $\mu$ L will be used.

4. The proctor will determine a reasonable amount of time to complete the search.

### **III. Re-Test Administration**

A. If the canine team fails any phase of the practical exercise evaluation, the team may be reevaluated in that particular phase. Canine teams will be allowed two attempts to successfully pass the requirements of each phase during an evaluation. If the team does not pass by the second attempt, the team may be reevaluated in all phases as determined by the evaluator if time permits.

### **IV. Handler Evaluation**

Throughout the Practical Exercise Searches, the handler should be evaluated on the following:

1. Calibration of canine
2. Scene safety inspections
3. Deployment of canine
4. Scene search procedures
5. Scene contamination and cross contamination issues

## **Certification**

Upon successful completion of all phases of the certification protocol evaluation, the Accelerant Detection Canine Team will be deemed certified and will be provided with a final evaluation form that will become part of the handler's training records, and any departmental records the handler's agency retains.

The certification will be valid for one year from the date of issuance. In the event the Accelerant Detection Canine Team fails to successfully complete all phases of the protocol evaluation, the team will not be certified.

There is no time limit for a team to complete each phase of testing; however, the proctor may stop the test once it has been made evident that the team cannot locate the aids.

For the purpose of annual re-certification, the handler may request an extension of up to 90 days to extend his/her team's certification if extenuating circumstances warrant.

Certifications are valid for the individual Accelerant Detection Canine Team only and are non-transferable should any changes in the team occur.

## **DEFINITIONS**

**Alert** – The alert is the multiple behavioral changes in the canine when he gets his nose in the odor he is trained to detect.

**Blank Can** – Training aid that has no ignitable liquid placed in it.

**Blank Room** – Room that has no ignitable liquid placed in it.

**Calibration** – Placing one of the ignitable odors the canine is imprinted on in an area that will not impact the investigation, and having the canine search that area prior to going into the scene and after leaving the scene.

**Certified Accelerant Detection Canine Team** – One canine and one handler that together have met the established criteria of this standard to be certified. If the dog changes handlers, a new team exists and will need to be recertified.

**False Alert** – When a canine responds to a particular odor that is not an ignitable liquid.

**Hot Containers** – Training aids that have had ignitable liquids placed into to them.

**Missed Target Source** – When the canine works over an area and fails to alert to where an ignitable liquid was placed.

## Acknowledgements

### **OSFM/CSFA Accelerant Detection Canine Team Standards Taskforce:**

Marge Yarbrough (Co-Chair)	Office of the State Fire Marshal Arson/Bomb Unit
Mike Esparza (Co-Chair)	Riverside City Fire Department California State Board of Fire Svc.
Michael Neu	Los Angeles Fire Department California State Firefighters' Assoc.
Terry Miller	Riverside City Fire Department California State Firefighters' Assoc.
Loran Blasdell	Porterville Fire Department Calif. Conference of Arson Investigators
Bruce Schofield	San Bernardino County Sheriff Dept. North American Police Work Dog
Dennis Johnsen	Santa Clara County Fire Department

### **Principle Advisors/Technical Experts:**

Frank Oglesby Canine Standards Committee, Chair	Los Angeles Fire Department California State Firefighters' Assoc.
Dennis Woodring	Office of District Attorney, Dauphin County, Pennsylvania
Blaine Blackstone	Los Angeles Police Department
Rosa Tufts	Los Angeles Fire Department
John DeHaan, PhD	Criminalist, Fire-Ex Forensics, Inc.
Terry Fleck, Ed.D.	Deputy Sheriff II / Canine Handler (Ret.)

### **Advisors**

Al Blank, Chief	DOJ ATF&E Arson Training Unit
David Hillman, Chief	Cal Fire, Law Enforcement & Fire Prevention
Tom Derby, President (2009-10)	Calif. Conference of Arson Investigators
Ed Marsico, District Attorney	Dauphin County, Pennsylvania
Donald Konkle, President	Pennsylvania Fire & Emergency Services Inst.