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# **DOE STANDARD**

## **Canine Explosive Training Aid Management**



**U.S. Department of Energy  
Washington, D.C. 20585**

**AREA SANS**

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## FOREWORD

Sites with canine programs within the Department of Energy (DOE) and National Nuclear Security Administration (NNSA) complex must manage explosive training aids to maintain the proficiency of their explosive detection canine teams. This standard identifies the chemical compounds (explosives and oxidizers) that may be utilized for explosive detection canine training, certification and performance testing, and provides guidelines for managing explosive training aids in a uniform manner to maintain quality and purity.

The guidelines presented herein reflect current “best practices” identified within DOE and NNSA; other Federal agencies, e.g., Bureau of Alcohol, Tobacco, Firearms and Explosives; Department of State; and the law enforcement community. Other DOE standards provide additional guidelines that apply to explosives. DOE-STD-1212-2019, *Explosives Safety*, for example, provides safety-related guidelines for the handling, storage and transportation of explosives. Nothing outlined within this standard is intended to supersede the requirements of DOE-STD-1212-2019.

DOE technical standards do not establish requirements. However, all or part of the provisions in this standard can become requirements under the following circumstances:

- a. The standard is invoked in a DOE requirements document, e.g., a purchase requisition, policy, contract, order, etc.
- b. An organization makes a commitment to meet a standard in an implementation plan or program plan.

Throughout this standard, the word “must” or “shall” is used to denote actions that must be performed if the objectives of this standard are to be met. If the provisions in this standard are made into requirements through one of the methods discussed above, then the “shall” statements would become requirements. Goals or intended functionality are indicated by “will,” “may,” or “should.” Automatic conversion of “should” statements to “shall” statements would violate the consensus process used to approve this standard, and would not be appropriate.

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**ACRONYMS**

|       |   |
|-------|---|
| ATF   | Department of Homeland Security - Bureau of Alcohol, Tobacco & Firearms |
| DOE   | Department of Energy  |
| DoS   | Department of State   |
| DOT   | Department of Transportation  |
| DMNB  | 3-Dimethyl-2, 3-Dinitrobutan (Taggant for Explosives)                   |
| EGDN  | Ethylene Glycol Dinitrate (Nitroglycol)                                 |
| EOD   | Explosive Ordnance Disposal Unit  |
| ESC   | DOE/NNSA Explosives Safety Committee                                    |
| HME   | Homemade Explosives   |
| HMX   | Cyclotetramethylene-tetranitromine                                      |
| LSPT  | Limited Scope Performance Test  |
| MOA   | Memorandums of Agreement  |
| MOU   | Memorandum of Understanding   |
| ODFSA | Officially Designated Federal Security Authority                        |
| ORT   | Odor Recognition Test (USPCA)   |
| PF    | Protective Force  |
| NESTT | Non-Hazardous Explosives for Security Training and Testing              |
| NG    | Nitroglycerin   |
| NNSA  | National Nuclear Security Administration                                |
| p-MNT | Para-Mononitrotoluene   |
| PETN  | Pentaerythritol Tetranitrate  |
| RDX   | Cyclotrimethylenetrinitramine   |
| TNT   | Trinitrotoluene   |
| UN    | United Nations  |
| USPCA | United States Police Canine Association                                 |
| VA    | Vulnerability Assessment  |

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## 1 SCOPE

This document provides the framework for consistent utilization, handling, storage, transportation, replacement, and disposal of canine explosive training aids used by the DOE and the NNSA.

## 2 PURPOSE

Explosive training aids are used for training, certifying and performance testing of canines. The utility and effectiveness of the training aids can be significantly reduced if they become contaminated with other explosive types. Care in handling, transportation, and storage of explosive training aids will help maintain their overall quality and avoid cross-contamination. Additionally, recognizing when it is time to replace training aids will help ensure that canine teams are being trained and are performing at the highest level possible. This standard outlines accepted management practices for ensuring the quality of explosive training aids.

## 3 APPLICABILITY

The guidelines described herein are intended to support canine teams at all DOE and NNSA facilities that deploy explosive detection canine teams.

## 4 DEFINITIONS

***Explosive Detection Canine*** – A canine specifically trained to detect various explosive and/or chemical compounds.

***Homemade Explosives (HME)*** - Chemical compounds not created by a commercial manufacturer that present a threat to DOE/NNSA facilities, e.g., Perchlorate Based Mixtures, Urea Nitrate, Triacetone Triperoxide (TATP) and Hexamethylene Triperoxidediamine (HMTD).

***Canine Team*** – A Canine Handler and assigned dog trained to detect target odors, e.g., explosive compounds.

***Canine Program Manager*** – The person responsible for the Canine Program, or designee, who is knowledgeable of canine and handler performance standards and expectations. This position may include a subcontractor supervisor who provides detection capabilities to DOE/NNSA facilities.

***Imprinting*** – The process of introducing a chemical compound to an Explosive Detection Canine in a training environment.

***Performance Test*** – A testing protocol administered by Canine Program Managers and/or site performance test group personnel to provide assurance that the Canine Team performs in an acceptable manner.

**Explosive Training Aid** – A specific type and amount of a compound that is used as a stimulus for the Canine Team to detect. All test sources used in this protocol document are classified as United Nations Division/Class 1.1 (substances and articles that have a mass explosion hazard), Class 1.3 (substances and articles that have a fire hazard and either a minor blast hazard or minor projection hazard or both, but not a mass explosion hazard), Class 1.4 (substances and articles that present no significant hazard) and Class 1.5 (very insensitive substances that have a mass explosion hazard), United Nations Division 3 (flammable liquid), and United Nations Division/Class 5.1 (oxidizing substances).

## **5 CANINE EXPLOSIVE TRAINING AIDS**

### **5.1 General Planning and Conduct**

This standard provides guidelines for the selection of canine explosive training aids, but DOE and NNSA local field offices should also take into consideration the mission of the explosive detection canine teams, the recommendation of the Vulnerability Assessment (VA) group, and the criteria for canine team certification when determining the types of explosive training aids to be used for explosive detection canine training and testing. Some facilities may also elect to use simulants (non-hazardous aids) for certain training purposes. This standard does not pertain to the management of simulants, since the use of different types and quantities of simulants may yield vastly different results when subjected to identical circumstances. As such, the use of non-hazardous aids, e.g., Scent-Logix, True Scent, NESTT, explosive wrappers, should not be the sole test source used to maintain the proficiency of an explosive detection canine. DOE-STD-1225-2017, *Canine Performance Testing Protocol*, dated September 19, 2017, does not permit the use of simulants.

### **5.2 Certification Standards**

DOE Order 473.3A, Chg. 1, *Protection Program Operations*, Annex 2, Attachment 3, “Canine Program”, dated January 2, 2018, provides guidelines for maintaining a canine program and for the certification of explosive canine teams within the complex. Explosive detection canine teams are required to utilize several explosive compounds listed below in Table 1 to become certified.

### **5.3 Training Aid Master List**

Table 1 represents a list of explosive compounds that DOE and NNSA explosive detection canines may be trained to detect. For the purpose of meeting the intent of this technical standard, explosive detection canine teams shall be trained to detect all odors listed under the Mandatory column of the table. These explosive compounds may also be utilized for certifications and performance testing. Explosive detection canine teams should also be trained to detect additional odors listed under the Elective column.

Although it is ideal to train on all compounds under the Elective column, some DOE and NNSA sites may be limited by site-specific restrictions and availability of proper storage. The



procurement and use of explosive and oxidizer canine training aids shall be approved by the local DOE or NNSA Officially Designated Federal Security Official (ODFSA).

| <b>Mandatory</b>                                    | <b>Elective</b>  |
|---|--|
| Black Powder (free flow, time fuse, or safety fuse) | Ammonium Nitrate (prilled or powder, or the solid component binary explosives) |
| Double Base Smokeless Powder (DBSP)                 | Black Powder Substitutes (Pyrodex, Triple Seven, American Powder)              |
| Dynamite (containing EGDN or NG)                    | Single Base Smokeless Powder (SBSP)  |
| PETN  | Blasting Agents (Example: ANFO)  |
| RDX   | Emulsion   |
| TNT   | Water-Gel  |
|   | Cast Boosters  |
|   | Composition B  |
|   | Nitromethane   |
|   | Photo Flash/Fireworks/Pyrotechnics Powder                                      |
|   | Plastic Explosives (unmarked and marked with detection agents – Taggants)      |
|   | Semtex   |
|   | Tetryl   |
|   | HMX  |
|   | Perchlorates & Chlorates (Ammonium, Potassium and/or Sodium)                   |

**Table 1 Approved Explosive Training Aids**

**NOTE:** Chemical compounds commonly used to manufacture certain Homemade Explosives (HMEs), e.g., Perchlorate Based Mixtures, Urea Nitrate, Triacetone Triperoxide (TATP) and Hexamethylene Triperoxidediamine (HMTD), are elective compounds that are not likely to be maintained on DOE/NNSA sites due to safety concerns associated with manufacturing, storage and handling. Canine program managers should identify training opportunities whereby explosive detection canines are imprinted on these compounds and proficiency training should be attended as frequently as resources allow.

#### **5.4 Authorized Quantities of Explosive Training Aids**

Each DOE/NNSA site should attempt to train and performance test their assigned explosive detection canines on both small and large quantities (greater than five pounds) of explosive compounds.

**NOTE:** Explosive detection canines will often respond differently to large quantity explosives test sources and small quantity explosive test sources (five pounds or less). If individual sites are unable to maintain large amounts of explosives training aids that mirror the operational threat,

then the site should look for opportunities to train with other agencies with access to large quantity test sources, e.g., local, state and federal agencies.

DOE-STD-1225-2017, *DOE Canine Performance Testing Protocol Standard*, provides guidelines for conducting performance testing of the explosive detection canine teams within the DOE/NNSA complex. That standard identifies specific minimum test source weights and should be referenced to determine the amounts of explosive/oxidizer compounds to be maintained by each site.

## **5.5 Test Source Procurement**

Canine program managers shall evaluate the source for the explosive training aids to be procured for canine training for quality and purity. Procurement of training aids through military stores is not recommended because military explosives in storage are subject to explosive odor cross-contamination. Procuring explosive training aids from commercial vendors that ensure explosive compounds do not cross-contaminate is preferred.

## **6 HANDLING**

On-site handling of explosive training aids must comply with the requirements referenced in DOE-STD-1212-2019. The guidelines below are intended to help conduct explosive detector dog training sessions and prevent cross-contamination of the explosive canine training aids.

- a. Physical barriers should be utilized by personnel handling canine training aids to prevent direct contact with explosive compounds. The barrier may include items such as cotton bags, paper towels, and disposable gloves, e.g., nitrile, latex. A different barrier shall be used for each type of explosive that is handled. When using physical barriers, they should be disposed of using procedures that minimize the potential for the hands of personnel and other surfaces to become contaminated.
- b. Personnel that handle explosive training aids and test sources should not allow explosives to come in direct contact with their clothing or skin.
- c. Explosive training aids shall be placed in anti-static and/or non-permeable containment storage bags during storage and transportation. These storage bags shall then be placed within a vapor-tight container during these operations.
- d. No more than one vapor-tight container, used for transporting the explosives, may be opened at a time to obtain a test source while at the canine training or testing area.
- e. Explosives utilized at the training or testing area may be placed in close-proximity (<10 feet) such as when conducting USPCA Odor Recognition Testing, and parcel/luggage searches.

- f. Explosives used at the training or testing area may be placed in a variety of test containers, which may include items such as metal magnetic scent boxes, and USPCA Odor Recognition Test cans. These types of containers are not air tight, but they do afford a degree of protection by not allowing the explosive detector dog direct access to the explosive compounds.
- g. Personnel shall ensure that used explosive training aids are returned to the appropriate bags, containers, designated for the specific type of explosive.
- h. Explosive training aids shall not come in direct contact with other explosive training aid compounds.
- i. Clean barriers shall be placed under and/or around the explosive training aid, e.g., a paper towel, envelope, when the odor of the explosive training aid might permeate surrounding surfaces, or a surrounding surface might contaminate the explosive training aid, e.g., if it might become contaminated with engine oil or other substances.
- j. Explosive training aids shall be placed so that the explosive detection canine cannot have direct contact with the explosive training aid. This will help prevent the canine from contaminating the training aids, e.g., with saliva.
- k. Areas where explosive training aids are used shall be monitored to prevent the entry of unauthorized personnel.
- l. Contaminated materials, such as cotton bags, paper towels, gloves, containers, etc., should be disposed of to minimize the potential for contamination of other surfaces.

## **7 STORAGE**

On-site storage facilities of explosive training aids must comply with the storage and safety requirements referenced in DOE-STD-1212-2019, as well as local on-site packaging and storage procedures. Off-site storage of explosive training aids shall comply with the guideline as outlined in 27 CFR 555, *Commerce in Explosives*, dated April 1, 2012. The following additional guidelines will help minimize explosive odor contamination while explosive training aids are in storage:

- a. Handling practices discussed in the previous section of this standard shall be followed.
- b. Containers that are vapor-tight and give added levels of protection from odor cross contamination shall be utilized to store explosive training aids.
- c. Explosive training aids shall be placed in non-static and/or non-permeable containment bags, which are then placed within the vapor-tight container during storage.

- d. Glass jars may be used to store small explosive training aids when a high degree of purity is required. The jars shall be placed inside non-permeable bags, and vapor tight containers during storage.
- e. Only one storage container may be opened at a time while in the storage magazine.
- f. Transferring explosives from a vapor-tight storage container into another vapor-tight container, e.g., which may be used for transport, shall not occur inside the explosive storage magazine.
- g. Storage magazines with a platform, e.g., table or shelf, used to transfer explosive training aids to a transport container shall be covered with a disposable barrier, e.g., butcher's paper, packaging paper, etc. This will help prevent the odor of one explosive training aid from contaminating the platform and exterior of the transport container. The barrier is to be replaced with each explosive training aid being handled to prevent explosive odor cross contamination.

## **8 TRANSPORTATION**

Transportation of explosive training aids shall be in accordance with DOE-STD-1212-2019, local on-site packaging and transportation procedures, and Department of Transportation (DOT), 49 CFR Parts 100-185, *Hazardous Materials Regulations*, dated October 1, 2012. Additional guidelines below are intended to help prevent cross contamination of the explosive training aids while being transported.

- a. Explosive training aids shall be placed in non-static and/or non-permeable containment storage bags during transportation. These bags shall then be placed in a site approved vapor-tight transport container to provide an added level of protection from odor cross-contamination.
- b. Glass jars may be used to transport small explosive training aids when a high degree of purity is required. The jars must be placed inside non-permeable bags and site approved vapor tight containers during transportation.
- c. The amount of time the explosives are kept in the transport vehicle shall be minimized.

## **9 ACCOUNTABILITY**

Canine Programs within the DOE and NNSA Complex must strictly account for their explosive training aids; in accordance with DOE policies; DOE-STD-1212-2019; 41 CFR 109-1, *Property Management*, dated January 1, 2011; and local DOE/NNSA accountability procedures. Explosives stored off-site and utilized to support DOE/NNSA security interests shall be utilized in accordance with local ATF guidelines.

- a. Explosives must be inventoried at least annually to ensure 100% accountability and to ensure that explosive quantities do not exceed storage limitations.
- b. Explosive training aid placement for training and performance testing purposes shall be documented and include the following information:
  - (1) Date/time/location
  - (2) Canine team identity
  - (3) Explosive training aid description, e.g., type, amount, etc.
  - (4) Description of where the training aid is placed within the identified location
- c. Canine program managers shall establish an accountability process that documents the issue and return of explosive training aids to the storage magazine, in addition to the requirements outlined in DOE policies and DOE-STD-1212-2019. Explosive training aids that are stored within a DOE or NNSA facility and used for canine training and performance testing, shall be inventoried monthly at a minimum. The accountability process for issue and return of explosive training aids to the storage facility shall include the following information:
  - (1) Date and time of issue and return
  - (2) Explosive training aid description, e.g., type, amount, etc.
  - (3) Name of the individual receiving and/or returning the explosive aids to the storage facility.
  - (4) Verification that all explosive training aids are returned to storage.

## **10 EXPLOSIVE TRAINING AID REPLACEMENT**

### **10.1 Explosive Training Aids Replacement Cycle**

Canine program managers should be concerned with the contamination of the training aids and ensure the aids are replaced on a routine basis. Training aids often become cross-contaminated with the odor of other explosive compounds, or other substances being utilized in the operational areas during training and performance testing, over a period of time. At a minimum, explosive training aids should be replaced every 24 months. An extension may be granted beyond 24 months if approved by the local DOE or NNSA ODFSA. The canine program manager shall remove an explosive training aid from service if contamination is suspected.

### **10.2 Transferring Explosives Training Aids to Other Organizations**

Explosives must be properly disposed of and must follow the requirements outlined in DOE-STD-1212-2019 and any site specific guidelines as directed by the local DOE/NNSA Field or Site Offices. All transfers of explosive training aids shall be documented and include the name of the transferring and receiving agencies, type of explosive compounds, weight of each compound, date, and signatures of authorized representatives.

Disposal of explosive training aids shall include one of the following options.

- a. Explosive training aids may be turned over to either a local, state or federal explosive ordnance disposal (EOD) unit for training and/or disposal, as outlined in existing memorandums of understanding (MOU) or memorandums of agreement (MOA).
- b. Explosive training aids may be issued to on-site explosive technicians.
- c. Explosive training aids may be issued to an approved site-specific off-site commercial hazardous materials disposal vendor.

## **11 EXPLOSIVE TRAINING AID CROSS CONTAMINATION INDICATORS**

DOE and NNSA canine program managers should identify measures that may be taken to minimize contamination of the assigned canine explosive training aids. The source of contamination may come from other explosive compounds; explosive detection canines, e.g., saliva; and unwanted environmental contaminants, e.g., grease, human food, etc. The guidelines herein are designed to minimize the potential for explosive odor contamination. The recommendations listed in this standard shall not supersede or violate the requirements within the current versions of DOE-STD-1212-2019, or DOT, 49 CFR Parts 100-185.

DOE and NNSA canine program managers should continuously look for signs of contamination of canine explosive training aids used for explosive detection canine training and/or testing. Indicators of contamination include:

- a. Explosive detection canines are not responding to new explosives received from a commercial vendor.
- b. Explosive detection canines are not responding to the training aids from an outside agency.

**NOTE:** If the explosive detection canines assigned to a specific site are having difficulty responding to the explosives training aids, in addition to contamination, the program manager should consider if someone has tampered with the integrity of the explosive compounds, e.g., theft or substitution.

## **12 SAFETY**

All operations conducted with explosive training aids shall be in accordance with DOE-STD-1212-2019. If there are discrepancies with the requirements outlined in DOE-STD-1212-2019, the canine program manager shall contact his/her site Explosives Safety Representative for guidance.

**APPENDIX A. BIBLIOGRAPHY**

27 Code of Federal Regulations 555, *Commerce in Explosives*, dated April 1, 2012

41 Code of Federal Regulation 109-1, *Property Management*, dated January 1, 2011

DOE O 473.3A, Chg. 1, *Protection Program Operations*, dated January 2, 2018

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