

FILE
LAWL
~~RED~~
BLUE 92

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: Distribution DATE: October 15, 1992

THRU: G. A. VanTien *[Signature]* MAIL STOP/TELEPHONE: K496/7-6211

FROM: Frank Pearce, HDT Leader *[Signature]* SYMBOL: HDT-92-023

SUBJECT: REVIEW AND CHANGES TO HDT CHEMICAL DESTRUCTION SOP

Due to the number of minor changes throughout the SOP dated 12/13/90, it was easier and less confusing to rewrite the SOP. The attached SOP should replace the old SOP in its entirety.

There are no significant changes in operating procedures. Most of the changes reflect new organizational designations and previously agreed upon procedures between various groups that may be involved in the request, removal, destruction, and documentation of chemical destruction operations by the HDT when requested by EM-7.

Please note distribution change.

By signature below EM-8 approves of all environmental provisions of the SOP as meeting required regulations, EM-7 approves of the provisions as they pertain to EM-7, and M-1 approves of the use of TA-14, "Q"-Site East, as the normal destruction site.

Kenneth M. Hargis Date 10/30/92
K. M. Hargis, EM-8

Anthony Drypolcher Date 10/15/92
A. E. Drypolcher, EM-7

James R. Stine Date 10/28/92
J. R. Stine, M-1

FGP: fgp

Attachment: a/s



HDT-92-023
October 15, 1992

-2-

Distribution:

A. J. Tiedman, ADO, MS-A120
F. Bolton, HS-5, MS-K486
T. Drypolcher, EM-7, MS-E518
K. Hargis, EM-8, MS-K490
J. Stine, M-1, MS-C920
T. Hower, HS-5, MS-K494
HS SOP Office, MS-K489
HDT Members
HDT 3050
EMO File

ANNUAL REVIEW RECORD

REVIEWED BY: Frank Pearce DATE: 10/15/92

No Changes Changes recommended & forwarded date: 10/15/92

Changes Approved [Signature] Disapproved _____
Changes made by F Pearce Date 10/15/92

REVIEWED BY: _____ DATE: _____

No Changes Changes recommended & forwarded date: _____

Changes Approved _____ Disapproved _____
Changes made by _____ Date _____

REVIEWED BY: _____ DATE: _____

No Changes Changes recommended & forwarded date: _____

Changes Approved _____ Disapproved _____
Changes made by _____ Date _____

LOS ALAMOS NATIONAL LABORATORY HAZARDOUS DEVICES TEAM (HDT)

SOP FOR EMERGENCY DESTRUCTION OF UNSTABLE CHEMICALS

Change 1, 10/15/92

1. Purpose. To establish protocol and safe operating procedures for emergency destruction of unstable chemicals.

2. Scope

When requested by EM-7, or other appropriate authority, and directed by EMO, this procedure will be used by the HDT for emergency removal, transportation, and destruction of small quantities of unstable laboratory chemicals. Any large quantity involving large containers, i.e., drums, etc., may be handled somewhat differently under a Special Work Permit (SWP) detailing specifics.

The HDT can perform destruction at any approved location directed by appropriate authority.

3. Background. Certain reactive chemicals once they have deteriorated or aged to a point where they may have become shock-sensitive to opening, movement, etc., and are therefore hazardous to move, transport, or handle under normal disposal procedures, may have to be handled as explosive devices thus necessitating involvement of the HDT.

The Lab HDT may be called to retrieve, transport and perform destruction procedures as a matter of long standing professional practice by bomb disposal units, because of unique training and equipment to handle sensitive explosive devices.

The HDT has developed a small "burn-box" for use in thermal treatment of unstable chemicals. Generally, burning is preferred over the application of high explosives to destroy such chemicals for several reasons, one of which is to reduce the total quantity of undesirable chemicals released into the environment--see attachment (1). A description of this burn-box and its function are described below.

4. Responsibilities and Interface

The services described in this SOP and provided by the HDT shall be at the request of EM-7 when such work is beyond standard Laboratory waste management procedures, and shall be approved by HS-5, EM-8, and EMO.

The waste generator shall be responsible for developing the SWP to include coordination with appropriate Laboratory groups. The waste generator may obtain guidance from EM-7 concerning specific areas to be addressed in the SWP. EM-8 shall designate an appropriate RCRA site if other than TA-14.

EM-7 shall prepare, distribute and maintain destruction records.

EMO or HDT will coordinate any requirements with local or state police and/or protective force concerning movement protocol, traffic control, etc., over county, state, or Lab property.

The group owning the material to be removed shall be responsible for any expenses incurred by the HDT, to include packing or rigging material and damage to HDT equipment.

HS-5, EM-7 and EM-8 shall be responsible for providing appropriate guidance to the HDT concerning specific aspects of the disciplines associated with each respective group to support a specific request.

The HDT leader is responsible for the contents of this SOP and the general practices to be used for each operation. The bomb technicians involved in each destruction operation shall be in agreement on specific procedures to be used.

5. Description of Operations

For most destruction operations the HDT will use the burn-box for thermal treatment on small quantities of laboratory chemicals.

The box, made of 1/4" plate steel, measures 2'x2'x18" high, and is covered with a "stand off" lid (1/4" steel) which sits several inches above the box and has several 2" diameter holes for insertion of blasting caps.

For disposal operations the box bottom is lined with excelsior upon which is sprinkled a small quantity of diesel fuel or gasoline for reliable combustion of the excelsior. The excelsior will be remotely ignited with an electric match which is surrounded by several grams of pyrodex or smokeless powder for quick and reliable ignition.

The container of chemical to be destroyed is placed on top of the excelsior. Once this occurs, the container and box are not touched or moved, thus providing minimum risk to the technician from premature ignition/explosion/detonation while setting up the destructive charge.

The stand off lid is placed over the top of the box, and a detonator placed down through one of the holes in close proximity (not touching) to the container to be opened. The force of the blasting cap when detonated will ensure the rupture or shattering of the container, which is usually glass, plastic, or thin gauge metal.

If an electric blasting cap is used, it will be wired in parallel with the electric match for remote firing, thus rupturing the chemical container and igniting the excelsior simultaneously. The HDT may use the NONEL non-electric system or a non-electric time fuze system for rupturing the container when the HDT feels this is appropriate due to presence of excess static electricity (electrical storms, etc.).

After the chemical has been consumed by deflagration, explosion or detonation, any residue remaining will be wiped from the box, packaged and properly disposed of by EM-7. If it is determined that sampling of any residue is required, and this will be determined by the chemicals involved, EM-8 will be responsible for taking samples for analysis or arranging for sampling by appropriate agency.

6. Health, safety, and Environmental Concerns

A. Priorities

First priority shall always be safety of persons including bomb technicians performing this procedure. This procedure provides for increased safety over the use of large quantities of high explosives previously used for such destruction operations at the Lab. In view of personnel safety concerns, the HDT will perform actual removal, handling and destruction independently of other Lab personnel.

Safety and protection of the environment and property will be considerably enhanced by this procedure. An SWP will address specific concerns in this area.

When more than one chemical destruction operation is pending, priorities shall be established by HS-5.

B. Hazards

Normal hazards to HDT personnel would be:

Handling explosives.

Inadvertent deflagration, explosion or detonation of chemicals involved.

Reactivity and toxicity of specific chemicals.

7. Procedures for Safe Operations

All handling and firing procedures will be guided by the HDT Operations Guidelines, professionally accepted practices for U. S. Military Explosive Ordnance Disposal (EOD) Operations, and the FBI Hazardous Devices School Procedures.

There shall always be two bomb technicians present for all operations. One technician will be designated the firing technician, and one will assist and act as safety officer. The decision as to which technician is to perform which function will be verbally decided by the HDT members involved, and may not occur until the destruction site is reached.

The group possessing any chemical to be destroyed, HS-5, EM-7, and EM-8 as appropriate, shall advise the HDT of any specific safety and health concerns involving chemicals to be destroyed. Such shall be stated in the SWP. Under extreme circumstances when directed by EMO with advice from HS-5, if immediate removal and destruction is required without time for a written SWP, the HDT shall be verbally advised of any health concerns.

Actual firing will be conducted at a point away and upwind of the chemical to be destroyed. A standoff distance for the firing technician shall be at least 150 feet, but from a point where ignition can be observed. Additional distance shall be considered if conditions of extreme toxicity exist.

After firing, a wait time of at least 10 minutes after all visible flame has died will be observed prior to approaching the burn-box. Initial approach will be made by one technician only. After determining no further burning hazard is evident, others may approach for final inspection of results.

If unusual and/or unexpected residue remains in the burn-box, or if a specific health or environmental hazard is indicated, a clean-up of the burn-box shall be conducted by HS-5 and EM-7 as appropriate.

Certain chemicals may require the introduction of additional chemicals into the burn-box to insure proper destruction. An example is picric acid in aqueous solution may require the introduction of a small quantity of flammable liquid which will mix with water. This will aid in a more complete burn-off of the liquid, reducing the possibility of collected, wet picric acid remaining. Based on the type and volume of chemical to be destroyed, a determination will be made on the type and volume of chemical to aid in combustion.

When other chemicals are introduced into the process to facilitate destruction, they shall be listed in the SWP which must be approved by appropriate HS and EM organizations.

When destroying liquids, a secondary containment will be utilized under the burn-box.

The Fire Department shall be notified by EMO of operations including location. Normally, an engine and ambulance with emergency medical technicians (EMT) will be required for removal and transportation operations, but will not normally be required during actual destruction procedures. When the HDT feels the need for their presence during destruction operations, their services will be requested.

The HDT maintains a variety of personal protective equipment and devices to include robot, standoff manipulator, fire retardant clothing and flash suits, ballistic chest and head protection, and SCBA equipment. Selection of equipment will be at the discretion of the HDT depending upon the chemical(s) involved, location, and nature of the operation.

8. Relationships Between Operations and Support Activities

A RCRA destruction site location must be obtained/coordinated by HS-5, EM-7, or other appropriate Lab authority. Once a site is obtained, the EMO/HDT will coordinate specific operational requirements and restrictions with the controlling group.

NOTE: Currently, under guidelines from EM-8, if a chemical can be moved, it will be moved to TA-14, "Q"-Site East, for destruction. When this site is used, M-1 shall retain site control to ensure the area is evacuated of all unauthorized personnel and conditions are safe for the HDT to "fire". Once permission to fire is given to the HDT, the HDT shall perform destruction operations free of any other operating group's supervision, requirements, interference or observation of operations, except when specifically authorized by the HDT Leader. The HDT will remain in contact with the M-1 Firing Site Supervisor either by voice or radio.

Each chemical destruction operation shall be accompanied by a SWP prepared by HS-5 or EM-7, and signed by HS-5, EM-7, EM-8, an EMO Emergency Manager, group leader of the group holding the chemical, destruction site manager, and HDT.

When an ambulance and fire engine are required to standby on location, EMO or HDT will arrange for such support.

The SWP shall specify what measures are to be taken by the responsible group, to include but not limited to, removal of all other hazards which could be affected by the operation, building evacuations, presence of group or ENG/JCI personnel as may be required, etc.

The EMO will coordinate any police and protective force support as may be required.

9. Training

Members of the HDT have been formally trained either through the military as explosive ordnance disposal specialists or the FBI at the FBI Hazardous Devices School (HDS) as public safety bomb disposal technicians. The two FBI trained members have received formal training in demolitions at the U. S. Naval Explosive Ordnance Disposal School.

All members have received training in Advanced Explosives Technology through the International Association of Bomb Technicians and Investigators (IABTI). Members have received individual training through a variety of organizations and seminars in chemical disposal.

Attachment (2) certifies that one HDS performance standard for trained bomb technicians is to "Render safe and/or remove suspected improvised explosive devices, incendiary devices, explosives, explosive chemicals..."

The HDT conducts routine training in all aspects of bomb disposal work including handling and disposal of reactive chemicals.

HDT members are qualified in SCBA.

10. Emergency Procedures

The HDT will not attempt to remove any chemical from any location until operating personnel have removed all other associated hazards which could result in injury should there be an inadvertent deflagration, explosion, detonation or spill of the chemical involved.

The fire department shall always be informed of each operation, and their services requested as previously mentioned.

During each disposal operation, the HDT will have the capability of communications by cellular telephone and radio with the Emergency Operations Center, protective force, and fire department.

11. Attachments:
- (1) FBI Precautions and Techniques for Removal and Disposal of Hazardous Chemicals.
 - (2) FBI Special Technicians Bulletin 87-4 (STB 87-4).

LOS ALAMOS NATIONAL LABORATORY HAZARDOUS DEVICES TEAM (HDT)

SOP FOR EMERGENCY DESTRUCTION OF UNSTABLE CHEMICALS

Change "DISTRIBUTION" to:

A. J. Tiedman, ADO, MS-A120
F. Bolton, HS-5, MS-K486
T. Drypolcher, EM-7, MS-E518
K. Hargis, EM-8, MS-K490
J. Stine, M-1, MS-C920
T. Hower, HS-5, MS-K494
HDT Members
HDT 3050
EM File



U.S. Department of Justice

Federal Bureau of Investigation

Bomb Data Center

Washington, D.C. 20535

**PRECAUTIONS AND TECHNIQUES FOR REMOVAL AND
DISPOSAL OF HAZARDOUS CHEMICALS**

Special care should be taken, especially when road way chemical-related accidents are encountered, particularly those involving vehicles carrying unknown substances. The same security precautions should be followed as one assumes in the handling of a sensitive material such as black powder. Several incidents have been reported wherein a peroxidizable substance has been trapped between the neck and the cap of the bottle in a spill area and a well intentioned person has opened the bottle thus creating sufficient friction energy to cause detonation of the item. Those individuals serving as bomb technicians should remember that, although chemicals are not antipersonnel in nature, they can create deadly force and can certainly injure or kill. In this regard, it should be noted they are generally not as strong as an explosive device, generally not in and of themselves producing a schrapnel or a fragmentation effect, but this "advantage" is certainly negated by their unpredictability. A bomb technician who must deal with substances of this type certainly should ensure the availability of protective outer wear such as a flack vest or chest protector or other types of protection against possible schrapnel effects. It is certainly recommended that a face shield with goggles be worn and that those personnel who have contact lenses as permanent eyeglasses remove them because if chemicals are splashed into one's eye the contact will possibly trap the corrosive liquid in the eye.

A public safety representative who assumes responsibilities in the handling of and disposal of chemicals or hazardous items should also wear protective head gear, helmet or hard hat. In conjunction, protective fire resistant clothing, such as Nomex coveralls should also be worn for skin protection since ignition temperatures in chemical accidents have been known to exceed 1500° F, reaching their maximum heat potential in approximately five seconds.

A public safety representative, now being assured that he has protected himself and his personnel, must now in the handling of these items turn his attention to the safe handling, removal, and disposal of the substance in question. Specifically, one should be concerned about protecting the substance from shock, additional thermal and chemical assaults; and packaging of the substance in a viable and non-combustible, chemically non-reactive, and absorbent material.

Consideration should further be given to utilizing the bomb transportation vehicle for transportation of hazardous materials. The substance should then be taken to a remote area in the approximate area where explosive and incendiary items have been destroyed taking note of the important fact that chemical disposal and destruction should not be conducted at the exact same sites where explosives and incendiaries have been destroyed previously, since residue reaction may cause the hazardous material to become energized and destructive. The problem inherent for disposal of explosives are identical to those that one must face when chemical items or other hazardous materials are encountered. The two main methods of disposal are with fire or through explosive detonation and subsequent destruction. Both of these options have positive and negative attributes when destroying a chemical substance. One has to be concerned about the safety in the area where the fire is burning, the release of toxic fumes and smoke resulting from chemical burning, and the lack of control subsequent to the fire being initiated. When destroying chemicals or hazardous materials through detonation, one must ensure that the area to be utilized can sustain a significant high order detonation and one certainly should be aware of the type of explosion that will occur when detonation of these chemical items result. Another problem encountered when utilizing explosives to dispose of chemicals, is the fact that toxic waste may be only partially absorbed by the earth where the explosion has occurred and that such waste may be scattered above by wind and air currents, or through land and water run-offs as the result of a heavy rainstorm.

The third option one should specifically address when considering chemical destruction, is that of chemical neutralization, which occurs when one adds chemicals to an unstable substance to chemically neutralize and reduce the hazards to a minimum. This method can be unreliable and risky especially when one proceeds without proper training and facilities.

The public safety officers involved in the handling of chemicals or hazardous materials should be aware of the many rules, regulations, and guidelines concerning the proper storage of chemical material. Set forth below are some specific chemicals which, when uncared for, accumulate peroxides on a very hazardous level and should be disposed of within 12-15 weeks after opening unless the material is stored under nitrogen conditions or stored with a reducing metal such as sodium which should be stored in a well sealed storage area. All ether, and especially anhydrous, propylether, oxypropyl; all tetrahydrofuran chemicals; and potassium metals.

A very potent example of chemical degeneration concerns tolens reagent which is commonly used in organic chemical labs and is composed of sodium nitrate. In time the residue left in the containers can develop a silvery shine. It may well contain silver fulminate. Silver fulminate can be extremely sensitive to shock.

The last point one should consider when addressing representatives who will have to handle and/or control hazardous materials and chemicals, is the fact that many react violently, deflagrate and/or detonate when they come in contact with water. The group of chemicals that the reaction is most common to would be the hydrides. These, when contacted by water can create heat and hydrogen and may detonate. An example of this, lithium and aluminum hydride. Of course, one should also note that metals such as metal lithium, sodium, and potassium react with water in varying degrees with potassium reacting almost immediately and lithium reacting the slowest.

One final warning should be that chemicals can cause significant damage to the human body through absorption, ingestion, or inhalation. Some, of course, have to be confined before the damage occurs while others inflict damage regardless of the amount of oxygen available to the subject.



FBI Bomb Data Center

SPECIAL TECHNICIANS BULLETIN 87-4

NATIONAL GUIDELINES FOR BOMB TECHNICIANS

SOURCES: Federal Bureau of Investigation International Association of Bomb
Bomb Data Center Technicians and Investigators
Hazardous Devices School (IABTI)
USAOMMCS
Redstone Arsenal
Huntsville, Alabama

The history and development of bomb disposal in America is scarred by injury, death, and law suits. In fact, change has always been the unfortunate by-product of a major injury or death. During the week of March 22, 1987, a conference of bomb squad commanders and bomb disposal experts was convened at the Hazardous Devices School, Redstone Arsenal, Huntsville, Alabama to construct national guidelines for acceptable professional practice for bomb technicians. Guidelines were established for Performance, Candidate Selection, Training/Certification, Equipment/Tools, and Operational Response. Representatives from the following agencies were in attendance:

Arizona Department of Public Safety
Baltimore County, MD, Police Department
Chicago, IL, Police Department
Cobb County, GA, Police Department
Federal Bureau of Investigation Bomb
Data Center
Hazardous Devices School, USAOMMCS
Redstone Arsenal, AL
Houston, TX, Police Department
Las Vegas, NV, Fire Department
Los Angeles County, CA, Sheriff's Department
Michigan Department of State Police
New York City Police Department
Orange County, CA, Sheriff's Department
City of Orlando, FL, Police Department
Naval School, Explosive Ordnance Disposal,
Indian Head, MD

The conferees were invited to the FBI sponsored conference based on a variety of criteria: some represent the most active bomb squads in the country, some represent the most innovative bomb squads, and others have demonstrated influential leadership through their performance within the bomb technician community. Agency size and geographical considerations were incorporated in the conference make-up. But most importantly, the conferees shared a common agenda to improve the level of safety for the public safety bomb technicians of the United States. The conferees worked long and hard to develop national guidelines which would enable public safety agencies to construct individual policies and procedures to limit the risk inherent in bomb disposal operations.

The FBI Bomb Data Center and the Hazardous Devices School have a particularly strong interest in these guidelines. Both are under a congressional mandate to provide the finest bomb technician training with safety, both public and personal, as the primary objective. Innovative technology during the past ten years has impacted upon the training curriculum of the school. The major focus of all training, both in the basic course and the refresher course, is the use of remote techniques and risk reduction equipment. In order to insure that the Hazardous Devices School training philosophy is compatible to operational procedures, we have chosen to improve our selection criteria to highlight available technology. Therefore, selection of candidates for bomb technician basic training beginning July 1, 1987, will require a certification from the public safety agency that essential safety equipment, as outlined in the guidelines, will be available upon graduation or will be included in the agency budget. This commitment will not be necessary should the agency certify that this essential safety equipment is in their inventory. Essential safety equipment includes: 1. bomb suit, 2. X-Ray equipment, 3. disrupter, 4. demolition kit, and 5. quality hand tools.

This document's sole purpose is to provide maximum safety for both the general public and the bomb technician response team. It is also uttered with full knowledge that danger can be reduced but never eliminated from a bomb disposal or hazardous explosive materials response. Preparedness, however, in the form of training, procedures and equipment, allows for a professional response and greatly reduces any reliance on luck. Effective law enforcement does not rely on luck but rather on progressively developed practices and techniques. If a police bomb technician utilizes the professionally accepted techniques available, technology and sound procedures become preeminent in the render safe operation.

The recommended equipment and procedures are meant to improve the level of safety but in no way guarantee the safety of bomb technicians or other persons.

NATIONAL GUIDELINES FOR BOMB TECHNICIANS

BACKGROUND

Prior to 1971, the burden of responding to and neutralizing improvised explosive devices, except for a few major metropolitan areas, was carried by United States Armed Forces Explosive Ordnance Disposal (EOD) units. Based on the increase of radical and terrorist bombings in the late sixties and early seventies, the federal government in the form of the Law Enforcement Assistance Administration (LEAA) and public safety agencies in the form of the International Association of Chiefs of Police (IACP) entered into agreements to respond to this urgent situation. The National Bomb Data Center was established and the Hazardous Devices School (HDS) was organized at Redstone Arsenal to provide bomb technician training to the civilian public safety community. A professional organization, "The International Association of Bomb Technicians and Investigators" (IABTI) was founded in 1973 with a charter mandate to maintain and enhance the professionalism of bomb technicians and bomb crime scene investigators.

More than 3500 public safety bomb technicians have been trained at the Hazardous Devices School in the last fifteen years and there are approximately 600 active public safety bomb technicians as of January 1987. When compared to the general law enforcement population, the bomb technician community is merely a small part. Recognition of its existence is further reduced by its characterization as a "black art." The technical nature of the work and security considerations involving its techniques not only add to its mystique but also to its obscurity.

A negative consequence of obscurity is that change does not necessarily flow from systematic review of policy and procedure, but rather from reaction to death, injury, and destruction. Within the bomb technician community, there is an active program to reduce hazard through training and the development of new equipment and techniques. But the hazardous nature of bomb technician activities rarely receives scrutiny by public safety officials except when death or injury has been sustained. This is unacceptable because life is irreplaceable!

The purpose of this document is to focus administrative attention on the selection, training and operational procedures of bomb technician personnel. In so doing, the veil of mystery surrounding this public safety profession will be diminished and organizations will exercise their responsibility to engage in risk reduction planning. Effective procedures not only provide guidelines for safe behavior, but also direction for future enhancements to professional performance.

GOAL

The goal of this document is to establish guidelines for acceptable professional practice by public safety bomb technicians which will provide maximum safety from physical jeopardy and legal liability for the individual, the governmental agency and the public.

PERFORMANCE

The competent public safety bomb technician will be trained and proficient in the following duties and responsibilities:

1. Render safe and/or remove suspected improvised explosive devices, incendiary devices, explosives, explosive chemicals (as currently defined by the Bureau of Alcohol, Tobacco and Firearms) pyrotechnics and ammunition.
2. Provide for legal, proper and safe transportation, disposal and/or storage of explosives and other items referred to above.
3. Conduct post bomb crime scene investigation.
4. Collect and preserve evidence.
5. Prepare and provide court room testimony.
6. Store, maintain, and inventory bomb squad equipment.
7. Provide technical support to special operations.
8. Provide dignitary protection.
9. Prepare and participate in explosive related training programs.
10. Maintain and be familiar with a technical library of Bomb Data Center publications and other explosive related materials.
11. Maintain professional liaison with other state and local bomb squads, military EOD units, federal agencies and professional associations.
12. Compile and report technical data on explosive devices and incidents.
13. Develop agency emergency response plans for a bomb threat, actual improvised explosive device and bomb crime scene.
14. Develop and promulgate bomb threat awareness and safety programs for public and private organizations.
15. Report found or recovered military ordnance to military EOD units.

SELECTION OF BOMB TECHNICIANS

The Hazardous Devices School, Redstone Arsenal, Alabama offers bomb technician training for public safety personnel in the United States. Nomination of candidates is made to the FBI Bomb Data Center and the following selection criteria will be followed:

1. Be recommended by the individual responsible for bomb disposal.
2. Meet FBI Bomb Data Center application requirements, i.e., physical examination, credit check, arrest check, etc.
3. Have five (5) years experience in department.
4. Have five (5) years retainability within the public safety agency.
5. Be a willing volunteer to engage in basic bomb technician training.
6. Should possess, by vocation or avocation, familiarity with activities requiring manual dexterity.

NOTE: The following information is offered as a guide to assist the individual responsible for bomb disposal in selecting acceptable candidates. Behavioral studies of bomb technicians and military EOD personnel have defined the following desirable characteristics:

Practical - exercises good judgment and decision making in current job performance evaluations.

Technically Oriented - demonstrates an interest and current participation in technical endeavors.

Sociable - capable of working in small groups with active and effective interaction.

Curious - demonstrates willingness to independently expand knowledge base and skills level.

Self-Confident - current evaluations indicate dependability and conscientious performance.

Fairly Unconventional - current job performance demonstrates rambunctious behavior within the rules rather than impulsive and rebellious behavior.

There is a significant correlation between psychological health/physical well being and successful performance as a bomb technician.

The effective bomb technician is a **risk taker**:

- 1) Relies on calculation.
- 2) Assesses the unknown.
- 3) Innovates within organization rules based on experience and training.

The ineffective bomb technician is a **chance taker**:

- 1) Relies on luck.
- 2) Challenges the unknown.
- 3) Reacts from a gut reaction based on experience and perception.

TRAINING

The proficient bomb technician shall have thorough competence derived from training and continuous practice including the following criteria:

1. Must be a Hazardous Devices School graduate or have sufficient military EOD background involving improvised explosive devices to be eligible for refresher class at Hazardous Devices School.
2. Maintain certification.
 - a. Complete Hazardous Devices School refresher every 3 years.
 - b. Complete 40 hours (minimum) explosive related training (annually) to include the safe use of live explosives through practical applications.
3. Maintain proficiency in use of essential safety equipment and tools.
4. Maintain training records and explosives reference publications.

BOMB TECHNICIAN ESSENTIAL SAFETY EQUIPMENT

Bomb technician activities are technical in nature and are carried out in a high risk environment. The bomb technician relies on quality manufactured tools and equipment. Safe performance of the bomb technician activities requires the following **essential safety equipment**:

Portable Bomb Disposal
X-Ray System
Full Coverage Bomb Suit
Dearmer/Disrupter

Demolition Kit (Galvanometer,
Blasting Machine, Firing
Wire, Explosives, Caps)
Hand Tools:

Pocket Survival Tool	Cutter Diagonal
Line, 9 mm 300'	Screwdriver assortment
C-Clamps, assorted sizes	Flashlight, dental
Furniture Clamps	Dental Mirror
Grappling/Treble Hooks	Scalpel Handle
Riser Cord, Parachute 300'	Scalpel Blades # 10, 11, and 12
Nylon-filament adhesive tape	Stethoscope
Electrician's tape, vinyl	Tongue Depressor, wooden
Electrician's tape, fabric	Probe, phenolic
Wrench, crescent 10"	Hemostats, assorted
Channel Lock Pliers	Drill, hand or cordless electric, or brace
Vise Grip Pliers, standard	Drill bits ass. (1/16" to 1/2")
Vise Grip Pliers, needle joint	Hacksaw
Pliers, slip joint	Hacksaw Blades
Pliers, needle nose	Candle/Matches

BOMB SQUAD SAFETY EQUIPMENT

Safe bomb disposal requires a team approach utilizing a minimum of two (2) properly equipped bomb technicians. In addition, a bomb squad should possess the following **safety equipment**:

Bomb Disposal Robot	Electric Drill and Drill Bits
Van-Type Vehicle	End Cap Remover
Fire Extinguishers	Communication Equipment
First Aid Kit	Remote Opening Tools
Bomb Trailer	Rigging and Rope Equipment
Multi-Tester	Blasting Cap Protector
Battery Tester	Car Creeper
Camera	500' 1/2" Nylon Rope
Tape Recorder	Various Pulleys and Clamps
Portable Storage Area	Evidence Collection Kit
Portable Lighting System	Metal Detector
Hydraulic Jack	Mini Pocket Kit of Tools (Dignitary Protection)
Post Blast Kit	Gloves (Fire Resistant)
Portable Generator	Gloves (Chemical Resistant)
Bomb/Explosive/Chemical Reference Publications	
Shovels, Rakes, Sifting Equipment, etc.	
Full Self Contained Breathing Apparatus	