BUTTE COUNTY SHERIFF'S OFFICE
Explosives Recognition and Response for First Responders

I. **Training Briefing**

A. A brief history of the civilian Bomb Squads in the United States.
1. Hazardous Devices School: began official training of all civilian Bomb Technicians in 1971.
2. Butte County has had an accredited Bomb Squad since the early 1990's.
(a) Information about the current members.
3. Training requirements for Bomb Technicians

B. Overview of training.
1. Commercial explosives, military ordnance, Improvised Explosive Devices (IEDs), statutes and response to possible explosives related incident.

C. Agency policies
1. Does your agency have policies in place?
2. Have they been reviewed for current compliance?
(a) Requirements

II. **Explosives**

A. Definition: Rapid conversion of a solid or liquid explosive compound into gases.
1. Explosion - a rapid form of combustion.
2. The speed of the burning reaction constitutes the difference between combustion, explosion, and detonation.
(a) Detonation is defined as instantaneous combustion

B. Effects of an explosion
1. Blast Pressure
(a) Detonation produces expanding gases in a period of 1/10,000 of a second and reaches velocities of up to 13,000 mile per hour, producing 700 tons of pressure per square inch and can reach temperatures of about 8,000 degrees F.

(b) The blast front will vaporize flesh and bone and pulverize concrete.
(c) Mass of expanding gas rolls outward in a spherical pattern like a giant wave.

2. Positive and Negative pressure
(a) Positive: short fast and hard (shock)
(b) Negative: longer, slower in duration and more damaging
(c) Differences can be measured in 1000th's of a second

3. Fragmentation /shrapnel
   (a) Pipe bomb will reach about the same velocity as a military rifle bullet - approximately 2,700 feet per second.
   (b) Fragmentation: pieces from container
   (c) Shrapnel: pieces attached to container or accelerated with explosion

C. Explosives / types

1. Classification
   (a) Low Explosives
      (1) Deflagrate (burn) rather than detonate
      (2) Initiated by a flame/safety fuse
      (3) Primarily used as propellants and have pushing or heaving effect
      (4) Examples: Black powder/smokeless powder
      (5) Must be confined to explode; otherwise deflagration
      (6) Burning rate of under 3,280 fps

   (b) High explosives
      (1) Detonate – instantaneous combustion (has its own oxidizers)
      (2) Must generally be initiated by a blasting cap or booster
      (3) Primary purpose is to shatter or destroy
      (4) Detonating velocity from 3,300 fps to 29,000 fps
      (5) Does not require confinement

2. Common types of Explosives
   (a) Black powder
      (1) One of the most dangerous explosives known to man
      (2) High sensitivity to friction, heat, impact and sparks
      (3) May be set off by static electricity
      (4) Readily available and therefore is a favorite of bombers
      (5) Frequently used in pipe bombs

   (b) Smokeless Powder
      (1) Small arms ammunition
      (2) Vary in both color and form
      (3) Same sensitivity as with black powder
      (4) Frequently used in pipe bombs

   (c) Dynamite
      (1) Used commercially in earth moving operations.

(2) Packaging varies in color and has a bin wax paper. Unwrapped it will usually appear have a light tan to reddish brown color.
(3) 4" to 36" in length, and has a heavy pungent, sweet odor. The NG can cause severe headaches.

(d) Ammonium Nitrate
(1) Least sensitive and most readily available commercial fertilizer
(2) Small compressed pellets called "prills"
(3) Needs a booster
(4) ANFO=Ammonium Nitrate and fuel oil

(e) TNT
(1) Very common military explosive used as a booster charge, bursting charge, and demolition charge
(2) Most common form is ¼, ½, and 1 pound blocks.
(3) Very stable, 20 year shelf life.

(f) Composition C-4
(1) Has no odor and comes in different block sizes
(2) Used for demolition purposes
(3) White in color
(4) Can easily be made with readily available chemicals

(g) Detonating Cord
(1) Resembles safety fuse but has a white or pink core
(2) Used to detonate high explosives - usually by wrapping it around the explosives
(3) It is also used for simultaneous detonations of a number of charges – Trunk line is laid connecting the charges.
(4) Travels about 4 miles per second

(h) Peroxide-based explosives
(1) Two explosive mixtures used in the fabrication of IEDs are;
(a) HMTD (hexamethylene triperoxide diamine).
(b) TATP (triacetone triperoxide).
(2) Both are extremely sensitive and, thus, dangerous.
(3) Similar in appearance to crack cocaine and methamphetamine
(4) Drug testing kits can cause hypergolic chemical reaction.

2. Initiation Devices
(a) Safety fuse

(1) Contains a black powder filler – burn rate varies Approximately 40 seconds per foot burn rate
(2) Used for detonating explosives non-electrically or can be used for a direct means for initiation of a low explosive main charge

(b) Blasting Caps
(1) Used for initiating high explosives and a contain a small amount of a primary explosives
(2) Initiated either electrically or non-electrically
(3) Must be protected from Friction, Impact, Shock, Heat (fire) and Electrostatic Discharge (FISHED)
(4) Vary in size from 1" to several inches in length
(5) Blasting caps are high explosives and can become very unstable even when stored in ideal conditions.

(a) Copper: The mercury fulminate used in old blasting caps reacts with the copper used in the cap to create extremely sensitive and explosive crystals.
(1) On Oct 2, 1997, Sgt Richard J. Schuenning of the Oregon State Bomb Squad was killed while disposing crystallized copper caps.

3. Fusing and Firing
(a) Time – chemical delay, fuse, clock (digital circuitry provides years of time), etc.
(b) Action – (Victim actuated) electrical, pressure sensitive, mechanical (tripwire), light sensitive
(c) Command – radio controlled hard wired, missile projected

4. Improvised Explosive Device
(a) Constructed in a non-standard manner, incorporating explosives or destructive, lethal, noxious, pyrotechnic, or incendiary chemicals
(b) Designed to kill, injure, destroy, disfigure, distract, or harass

5. Military ordnance
(a) Easily identified by first responders:
(1) Hand grenades
(2) Mines
(b) Every military in the world uses similar types of ordnance.
(c) Because an item is painted or marked as inert, you should never consider the item as safe.

III. **Response**

A. Safety
1. Work within your level of expertise / policy
2. Any response that stimulates your curiosity should also arouse your officer survival instincts
3. Law Enforcement responsibility:
(a) Recognize
(b) Retreat
(c) Report components (get the best description without disturbing the item or staying on scene longer than necessary).

B. Priority Actions
1. Life Safety
(a) Care must be taken to avoid endangering either the responders or the public.
(b) Proper standoff distances and shielding must be considered when positioning response vehicles and other equipment and when moving or evacuating personnel.
(c) Requesting and providing proper and sufficient resources from the onset is essential to a safe and successful operation.
2. Identification and preservation of evidence
(a) Second priority to sanctity of life
(b) To facilitate identification, apprehension, and prosecution of the perpetrator(s)

C. Safety Rules
1. DO NOT TOUCH THE ITEM.
2. Always move people away from the suspicious item – DO NOT MOVE, touch or cover the ITEM.
3. Unless directed by a Bomb Technician, Never use a radio, cellular telephone, or other transmitter within a minimum of 300 feet of a location where there is a suspected or actual explosive device.
4. If you can see a suspicious item, it can see you.
5. Pay close attention to appropriate evacuation distances.
6. Be aware of the potential for secondary devices.
(a) Area should be cleared
(b) Repeated use of same area

D. Render Safe
1. Will only be done by or at the direction of Bomb Technicians
2. Specialized training and equipment is required.
3. Keep everyone else out of harm's way.
(a) If you can see the device, it can "see" you.

(b) Never handle a device or suspected device

IV. **HME**

A. History (not necessarily in same order-)
1. Shoe bomber
2. Underwear bomber
3. Univ TATP (Oklahoma?)
4. Chico TATP

B. Labs
1. Resources:
(a) Anarchist cookbook
(b) Internet
(c) Chemistry Books

2. Equip/ materials
(a) Chemistry (beakers etc)
1. Similar to meth

3. Products:
(a) Chemicals
(1) Pool supplies
(2) Acetone
(3) Ammonia
(4) Sulfuric acid
(b) Powders
(1) Chlorine
(2) Aluminum powder
(3) Hexamine
(4) Potassium
(c) Containers
(1) Burners
(2) Beakers
(3) Refrigerated substances

4. Common HME's
(a) TATP
(b) AN (ice pack)
(c) Poor man's C-4
(d) Mol's
(e) Acid / dry ice
(f) Pipe bomb

V. **Bomb Squad Equipment**

A. Bomb Suits
   1. Specially designed suits for Bomb Technicians

B. Robot
   1. Designed for remote operations

C. Percussion Actuated Non-Electric (PAN) Disrupter
   1. Modified shotgun designed especially for render safe operations
   2. Uses 12 gauge shotgun rounds for various applications

D. X-Ray
   1. Digital scanner for developing on scene
   2. Provides the Bomb Tech with detailed information of item

E. Rigging equipment
   1. Allows Bomb Tech to operate remotely

F. Single vent trailer
   1. Allows for the transportation of explosives
   2. Not designed for RSP

G. Hand entry-tools
   1. Various tools for hand-entry into a suspected device – although it is discouraged except when the situation dictates.

H. Miscellaneous other equipment

VI. **Statues/Overview**

A. Bomb Threats/Facsimile Bomb
   1. 148.1 PC – F/M – False report of secretion of explosive or facsimile bomb; sending or placing false or facsimile bomb.

B. Terrorism
   1. 11413 PC – F – Use of destruction device or explosive or commission of arson in certain places (hate crimes).

C. Possession of explosives, concealed
   1. 19100 PC – F – Any bullet containing or carrying and explosive, any metal military practice hand grenade or metal replica hand grenade
      (a) This section does not apply to any plastic toy hand grenade, or any metal military practice hand grenade or metal replica hand grenade that is a relic, curio, memorabilia, or display item, that is filled with a permanent inert substance or that is otherwise permanently

altered in a manner that prevents ready modification for use as a grenade.

D. Destructive Device

1. 18710 PC - F/M– Possession
   (a) Any person who possesses any destructive device, other than fixed ammunition of a caliber greater than .60 caliber.

2. 18725 PC – F
   (a) Carrying or placement of explosive or destructive device on passenger vessel, aircraft, car or other vehicle.

3. 18715 PC – F
   (a) Possession of destructive device or explosives in or near certain places
   .

4. 18740 PC – F
   (a) Wrongful possession, explosion, etc., of destructive device or explosive with intent to injure or intimidate person or to injure or destroy property.

5. 18730 PC – F
   (a) Sale or transportation of destructive device.

6. 18745 PC – F
   (a) Use of explosives to attempt murder.

7. 18750 PC – F
   (a) Unlawful explosion or ignition of destructive device or explosive causing bodily injury.

8. 18755 PC – F
   (a) Unlawful explosion or ignition of destructive device or explosives causing death.

9. 18720 PC – F
   (a) Possession of materials with intent to make explosive or destructive device.

10. 20110 PC - F/M
   (a) Booby traps.

VII. **Demonstration**

A. Safety brief

B. Demonstration of the explosive effects of blasting caps.
   1. Chicken / fruit (1 cap)
   2. Paint can (1 cap)

C. Burn tests
   1. Black powder train (electric match/ hobby fuse)
   2. Hobby
   3. Time

D. HME
   1. Dry ice
   2. PP/ G
   3. Anti freeze/
   4. Self-igniting Molotov
   5. Napalm (gas/bands)
   6. ANFO (1 cap)
   7. Det-cord (1 cap)
   8. Ice pack (1 cap)
   9. Poor man's C4 (1 cap)

E. Time Permitting
   1. Toilet Paper/ nitro (1 cap)
   2. Wall o' Fire (1 cap and Det-cord)
   3. Flaming Tire lift (1 cap and booster)