SAN BERNARDINO COUNTY SHERIFF

Chemical Agents Instructor Course, POST CC# 2330

Course Purpose*: The purpose of this course it to provide instructors of chemical weapon munitions with the knowledge, skills, and applicable concepts related to use of authorized chemical weapon munitions.*

Learning Outcomes: *Trainees will gain the knowledge and ability to effectively teach chemical weapon munitions to potential students. Students will be able to clarify and advance their understanding of adult learning concepts, as well as considerations related specifically to authorized chemical weapon use.*

Chemical Weapons Instructor Course General Outline

I. **Course Introduction**

- A. **Welcome Students**
  1. **Class Agenda**
  2. **Registration**
  3. **Facility Tour and information**
     - **a. Facility Awareness**
     - **b. Safety Procedures**
     - **c. Policies**
- B. **Instructor Introduction**
  1. **Administrative requirements**
  2. **Instructors introduced**

II. **Range Safety**

- A. **Safety Rules**
  1. **Basic Firearms Rules**
  2. **Range Safety Plan**
  3. **Sign Range Safety Protocol**
- B. **Local Animals/Insect awareness**
  1. **Rattlesnakes**
  2. **Bees**
- C. **Weather Conditions**
  1. **Heat**
  2. **Wind**

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3. **Rain**

III. **Instructor Development**

A. **Adult Learning Concepts**

1. **Teaching Styles**

a. Rote

b. Intimidator

c. Presenter

d. Developer

e. Facilitator

2. **Training Techniques**

a. Facilitated Discussion

b. Active listening

B. **RIDEM**

1. **Relevance**
2. **Involvement**
3. **Discovery**
4. **Experience**
5. **Modeling**

C. **Coaching and Mentoring**

D. **Learning Styles**

1. **Visual**
2. **Auditory**
3. **Kinesthetic/Tactile**

IV. Protective Masks

A. History

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1. First developed in England to protect against Chlorine Gas in World War I.

B. NIOSH

C. OSHA

D. Riot control masks

1. Used to protect against CS, CN, OC, Smoke

2. Sufficient oxygen required

a. Humans must be in an environment with at least 19.5 percent oxygen to survive.

E. Protective Mask Parts

1. Head Harness

2. Fasteners

3. Nose Cups

4. Face Piece

5. Lens

6. In-Take / Out Flow Valves

7. Canisters

F Prepare Prior to Use

1. Inspect all parts of the mask for signs of wear and damage

G. Fit Testing

1.Required - Appendix A of Section 5144 of Title 8 of the California Code of Regulations (Source – P.O.S.T. Model Respiratory Protection Program for Law Enforcement – 2004)

a. Must be fit tested with same make and model of mask to be issued

b. Fit test shall be at the time of issuance and yearly thereafter

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c. The person conducting the fit testing shall be trained

d The officer shall be instructed how to don the mask prior to fit testing

e. Officers who wear corrective glasses or other protective equipment must be fit tested with those items

f The fit testing must be qualitative (employee response to test agent) or quantitative (numerical measurement of leakage).

g The agency must maintain records of the type of testing used and the results of the test.

H.. Donning the Mask

1. Extend all straps and clear them away from the interior of the mask

2. Place chin in first

3. Using both hands pull both sides of the straps over the head

4. Tighten the straps by pulling back on the straps

5. Ensure that hair is not interfering with the seal

I. Test for Tightness

1.Place palm over the inlet valve

2.Inhale gently – Face piece should begin to slightly collapse

J.. Maintenance

1.Remove filters

2.Wash mask with mild soap and water

3.Air dry

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III. Tactical Considerations

A. Outdoor Deployment

1. Environmental Concerns

a. Wind

1. Wind plays a crucial role in the deployment of chemical agents in an outdoor environment.

2. Beaufort Wind Scale

3. Smoke

a. May be used to determine wind direction and speed

b. High Temperatures

c. Humidity

1. Keeps chemical agent close to the ground

2. Agent adheres to skin more readily

d. Rain

1. Keeps chemical agent on the ground reduces effectiveness

e. Ground / Surface

1. The type of outdoor surface, concrete, rock, grass, etc. may effect the deployment method

2. Cross Contamination

a. Care should be taken to identify and prevent contamination to sensitive areas

1. Hospitals

2. Schools

3. Large Office Buildings

3. Proper Chemical Agent

a. The specific chemical agent used will be determined by the

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situation and department policy.

4. Escape Route

a. Chemical agents are used to disperse large crowds, not make arrests

b. The group needs a place to go

5. Deployment

a. Effectiveness Range

1. Hand Deployment

a. Typically no more than 40-50 yards

2. Launched

a. Typically more than 50 yards

b. Placement

1. The gas canister should be placed upwind of the crowd and the escape route

2.The canisters should be placed close enough together to for the agents to overlap prior to reaching the crowd

3.Replacement canisters should be place as soon as possible to keep the crowd moving in the desired direction

B. Indoor Deployment

1. Patience

a. Chemical agents may take a few minutes to be effective

2. Deployment Plan

a. Floor Plan

1. Possibly obtain through City or County Planning Departments

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2. Same House in the neighborhood

b. Deployment Method

c. Type of Agent

3. Levels of Incapacitation

a. Incapacitation

1. The time when the suspect's action meet the goal of law enforcement

a) Usually when the suspect has been taken into custody

2. Suspect is incapable of being a threat due to physical and sensory dysfunction

b. Debilitating

1. Level of function where the suspect does not present a threat, partially incapacitated

c. Effective

1. Attains the operational goal

4.. Two Methods to Introduce Chemical Agents

1. "Volley Method"

a. Chemical agents are introduced in small doses a little at a time

b. Allows the suspect to surrender prior to being completely incapacitated

c. Down Side

1) Exposure time needs to be closely watched to prevent prolonged exposure

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2. "Hard and Heavy Method"

a. Method is when chemical agents are introduced at such high concentration levels that incapacitation occurs very quickly

b. Negative Aspects

1) Property damage and clean up efforts are more extensive and expensive

5. After Action Responsibilities

a. Collect expended cartridges

b. Document incident in chronological order of events

c. Photograph scene and suspects

IV. Chemical Agents in Riot Control Environment

A. Strategies

1. Crowd Size

a. Determines amount of chemical agents to use

b. Determine if goal is to split crowd into smaller groups or immediate dispersal

2. Crowd Activity

a. What the actions of the crowd to justify deployment of chemical agents

3. Law Enforcement Resources

a. Avoid attempting to disperse crowd without proper number of resources needed

b. Ensure Officers have proper equipment

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1. Protective Masks

2. Helmets

3. Impact weapon

4. Location of Demonstration / Riot

a. Reconnaissance of area is possible for potential innocent

people that may be affected by agents

b. Escape Route

1. The crowd must have an escape route

2. Purpose of chemical agent deployment is to disperse crowd

5. Wind Conditions

a. Wind Scale

b. Determine if chemical agents can be deployed

c. Wind determines where to place chemical agents

6. Outside Agency Staging

a. Fire Personnel

1. If pyrotechnic devices being deployed

2. High Risk of Fire

b. Medical Personnel

V. Decontamination Procedures

A. Personal Decontamination

1. Remove subject from contaminated area

2. Keep subject calm

3. Expose affected area to fresh air

4. Flush with cool water

a. 10-30 minutes, or until subject is able to open eyes on his own.

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5. Monitor breathing and consciousness

6. Seek medical assistance if symptoms persist

a. If symptoms persist after 30 minutes request medical assistance.

7. Do not use oil based soaps, lotion or ointments to assist in the decontamination process. This can trap the particles and extend the discomfort.

8. Clothing should be removed and laundered

a. Clothing can be laundered normally in most cases.

9. A shower will remove the particulates for the subject's skin and hair.

10. Properly document all decontamination efforts

B. Area Decontamination

1. Commercial cleaning company may be considered

2. Take personal precautions

a. Gloves

b. Protective Mask

3. Ventilate room or building by opening doors and windows

4. Large fans may be used to circulate fresh air

5. Furniture and carpeting can be vacuumed. Severe exposure may require carpeting to be removed.

6. Exposed food should be thrown away

7. Soap and water may be required

8. Properly document all decontamination efforts

VI. Computing Chemical Agent Concentrations

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A. Definitions

1. Lethal Concentration and Time (LCt50)

a. The concentration of the chemical agents multiplied by the length of time exposed to the agent that will kill 50% of those being exposed

b. Established concentration parameters for calculating LCt50 time of contamination

1). CN - 0.39660

2). CS - 0.70921

c. Established concentration parameters for calculating the number of munitions required for LCT50

1). CN - 14 grams-min/m3

2). CS -25 grams-min/m3

2. Incapacitating Concentration and Time

a. The concentration of the chemical agents multiplied by the length of time exposed to the agent that will incapacitate 50% of those being exposed

b. Established concentration parameters for calculating LCt50 time of contamination

1). CN - 0.00227

2). CS - 0.00057

c. Established concentration parameters for calculating the number of munitions required for ICT50

1). CN - 0.02 grams-min/m3

2). CS - 0.01 grams-min/m3

B. History of formulas

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1. **The formulas were developed by the U.S military and published in the Edgewood Arsenal Special Publication i n 1960's**
2. **The formulas were based on studies using CS and CN pyrotechnic devices in sealed enclosures**
3. **No humans were used for the testing**

C. Controversy

1. **There is a controversy in whether the calculations should be used**
2. **The Edgewood publication did not address the following:**
   - **a. Physical condition of suspect**
   - **b. Intoxication levels**
   - **c. Ventilation**
     - **1). Ventilation often occurs during deployment**

D. Calculating LCT50 and ICT50

1. **LCT50**
   - **a. Determine cubic feet of location**
     - **1). Cubic feet = length x width x height**
     - **2). Cubic feet can be converted into cubic meters by dividing the cubic feet by 36**
   - **b. Establish concentration parameters (predetermined)**
     - **1). CN - 0.39660**
     - **2). CS - 0.70921**
   - **c. Determine the available oxygen**
     - **1). Multiply the concentration parameter and the cubic feet**
     - **2). This will determine the amount of oxygen**

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d. Determine the amount of time of for LCT50

1). Divide the available oxygen by the grams of active

agent to determine the LCT50 in minutes

2. ICT50

a. Use the same formula for LCT50 except for the

established concentration parameters.

1) CN - 0.00227

2). CS - 0.00057

VII. Orthochlorobenzalmalonitrile (CS)

A. Classification

1. Lachrymator

a. Tear producing substance

B. Sternutator

a. Substance that irritates the nasal and respiratory passages –

causes sneezing and coughing

C. Irritant

D. Odor

a. Pepper

E. Color Code

a. Blue

F. Substance

a. White crystalline powder

G. Physical Effects

a. Tearing of the eyes

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b. Burning sensation on skin

c. Irritation of the respiratory system

H. Psychological Effects

a. Panic

b. Dispersion

I. Physical Conditions That Influence Effectiveness

1. Drug and / or alcohol influence

2. Mental health issues

J. Impact of environmental conditions on effectiveness

1. Wind

2. Rain

3. Humidity

K. Advantages of use

1. Can be delivered several ways

L. Disadvantages of use

1. Not as effective as CS or OC

2. Only effective on people with normal pain threshold

M. Decontamination Procedures

1. Personal Decontamination

a.. Remove subject from contaminated area

b. Keep subject calm

c. Expose affected area to fresh air

d. Flush with cool water

1) 10-30 minutes

2) or until subject is able to open eyes on his

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own.

e. Monitor breathing and consciousness

f.. Seek medical assistance if symptoms persist

1) If symptoms persist after 30 minutes request medical assistance.

g. Do not use oil based soaps, lotion or ointments to assist in the decontamination process. This can trap the particles and extend the discomfort.

h. Clothing should be removed and laundered

1) Clothing can be laundered normally in most cases.

h. A shower will remove the particulates for the subject's skin and hair.

i. Properly document all decontamination efforts

2. Area Decontamination

a. Commercial cleaning company may be considered

b. Take personal precautions

1) Gloves

2) Protective Mask

c. Ventilate room or building by opening doors and windows

d. Large fans may be used to circulate fresh air

e. Furniture and carpeting can be vacuumed. Severe exposure may require carpeting to be removed.

f. Exposed food should be thrown away

g. Soap and water may be required

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h. Properly document all decontamination efforts

N. Target Area

1. Eyes

2. Face

. VIII. Chloroacetophenone (CN)

A. Classification

1. Lachrymator

a. Tear producing substance

b. Irritant

B. Odor

1. Sweet

2. Apple Blossoms

C. Color Code

1. Red

D. Substance

1. White crystalline solid

E. Physical Effects

1. Tearing of eyes

2.. Blepharospasm

a. Involuntary closure of eyelid

b. Caused by excessive tearing

c. Burning sensation on skin

d. Pain due to stinging or burning sensation

F. Psychological Effects

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1. Panic

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d. Large fans may be used to circulate fresh air

e. Furniture and carpeting can be vacuumed. Severe exposure may require carpeting to be removed.

f. Exposed food should be thrown away

g. Soap and water may be required

h. Properly document all decontamination efforts

IX. Oleoresin Capsicum – (OC) – Pepper Spray

A. Classification

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1. Inflammatory Agent

B.. Odor

1. Sweet Pepper

C.. Color Code

1.. Black or Orange

D. Physical Effects

1. Involuntary closing of eyes

2.. Tearing of eyes

3. Inflammation of the respiratory system

a. Swelling of the mucus membranes

E. Psychological Effects

a. Panic

b. Disorientation

c. Fear

F. Physical conditions that influence effectiveness -

1. Alcohol and drugs may prevent the subject from feeling pain and discomfort

G. Impact of environmental conditions on effectiveness

1. Rain may force agent to the ground and dilute the agent

2. Humidity and heat may cause the agent to stick to the subject

H. Advantages and Disadvantages of use

1. Advantages – Most commonly carried by law enforcement, natural substance, easy clean up,

2. Disadvantages – Not 100 percent effective, cross contamination

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2) Protective Mask

c. Ventilate room or building by opening doors and windows

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X. Hexachlorethane (HC) – Smoke

A.. Classification

1. Non-irritant

2. Obscurant

3. Non-hazardous / Non-carcinogenic

B. Odor

1. Slight smoke odor

C. Color Code

1. Yellow

D. Physical Effects

1. Vision Obscured while in smoke

2. May induce confusion due to lack of vision

3. Coughing

E. Uses

1. Training

a. In place of actual chemical agents

b. Demonstrate

2. Concealment

3. Signaling

4. Distraction

5. Crowd Control

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a. May be used prior to chemical agents to induce panic

b. May be use to "float" chemical agent

c. Determine wind direction and velocity

XI Chemical Agents Demonstration and Exposure

1. Students will work in pairs and will be exposed (on a voluntary basis) to a 1 sec spray of OC in a variety of aerosol forms including stream, spray, and foam. Students may elect to engage in a simulation that involves arresting a suspect. Students will utilize commercial decontamination equipment in order to evaluate its effectiveness in dealing with OC spray.

2. The instructor will demonstrate proper and safe deployment of various tactical chemical agent munitions utilizing inert devices. Students will volunteer to exercise proper and safe deployment methods using hand-held devices.