



Department of Police  
Detroit, Michigan 48226

July 16, 1993

Coleman A. Young, Mayor  
City of Detroit

The Honorable Coleman A. Young  
Mayor of the City of Detroit  
1126 City-County Building  
Detroit, Michigan 48226

Dear Mayor Young:

**Subject: Chemical Spray Devices as Nonlethal Intermediate Weapons**

Our department currently trains to a Use of Force Continuum that escalates from verbal commands through physical control techniques to the use of deadly force. However, it has recently become evident that other steps should be included in our policy to enable officers to safely control violent or unruly persons whose actions fall short of circumstances wherein fatal force is appropriate without exposing either the citizen or the officer to undue risk of physical injury and/or death. Ideally, this weapon should be simple to use with minimal training, possess a high rate of success for incapacitating the subject without injury or medical side effects, be usable from a safe distance, and be easily carried by the patrol officer.

Currently, the only intermediate weapon authorized by the department is the baton, intended primarily for use as an impact weapon. While the use of the baton in certain circumstances is both appropriate and necessary, it falls short of the need for a non-injury type device.

Therefore, at my direction, a committee comprised of ranking department executives was impaneled to evaluate the department's use of force policy. One of the first specific areas of concern to be addressed was the issue of nonlethal intermediate weapons as a method of reducing injury to officers and citizens.

In preparation for the convening of the committee, a survey of large metropolitan police departments was conducted to ascertain what types of intermediate nonlethal weapons are in use. The survey disclosed that, in addition to the standard baton, both

electronic and chemical spray devices are in widespread use and throughout the country.

An evaluation disclosed serious flaws with the two predominant types of electronic devices. The effectiveness of the taser is hampered during the winter months because the projectiles cannot penetrate heavy outer clothing. The stun gun places the officer at risk because it requires the officer to get within arm's length of the subject to deliver the charge. For these reasons, as well as the public "cattle prod" perception of these devices, electronic devices were eliminated from further consideration.

There are various types of chemical spray devices available which typically utilize one or more of the following chemical agents: Chloroacetaphenone (CN) or Orthochlorobenzalmalonitrile (CS), both commonly known as tear gas, and Oleoresin Capsicum (OC) also called pepper spray. Depending on the manufacturer, chemical spray devices contain varying concentrations of either pure tear gas or combinations of tear gas and pepper spray.

Both CN and CS tear gas have been used by police agencies for years. CS is a stronger version of CN. Both chemicals are irritants which act upon the body's nervous system to cause pain, shortness of breath, irritation of mucous membranes, and tears in the eyes. Because both CN and CS chemicals depend upon this interaction with the nervous system, their effectiveness can be diminished if neural transmitters are blocked by drugs or alcohol. The interaction with the nervous system can also be reduced by higher levels of endorphins or adrenaline in the mentally disturbed.

When first introduced to police work, chemical devices contained pure CN tear gas. Persons or equipment exposed to this product required lengthy decontamination. Departments found that officers became reluctant to use the CN product (mace) because of the lingering effects of the chemical on the subject's clothing and the strong possibility of cross contamination.

In recognition of this problem, one manufacturer (Aerko International "Freeze") developed a diluted form of the stronger CS chemical in a liquid solution to enhance the evaporation rate. This reportedly shortens the recovery period and reduces the risk of cross contamination.

Whereas CN and CS may not be effective against certain individuals or animals, Oleoresin Capsicum (OC) has proved more effective in these exceptional cases. And, unlike CN and CS which are considered chemicals, OC is considered a food additive by the federal government. As a derivative of the pepper plant, OC is considered non-toxic. Studies by the U.S. Army at the request of the F.B.I. have concluded that there are no long-term medical effects resulting from the use of OC.

OC acts as an inflammatory agent causing swelling of airways and mucous membranes. Generally, a full exposure to OC results in labored breathing, eyes closing shut, and a burning sensation to exposed skin. The effects of OC dissipate in approximately 20-40 minutes. Manufacturers claim that exposure to OC will not adversely affect the health of persons suffering from asthma, emphysema or other breathing disorders.

At the direction of the committee, other police agencies were contacted for more detailed information on their use of chemical spray devices. This survey disclosed that, with the exception of Detroit, all other major departments (New York, Chicago, Los Angeles, Philadelphia, Houston, Washington D.C., Baltimore, Dallas, Milwaukee, and Boston) issue chemical spray devices to their personnel. While products containing pure CN gas (mace) were at one time popular, the current trend favors devices containing pure OC (pepper spray.) The survey revealed that 7 of the 10 major national departments currently utilize pure OC spray. Two departments (New York & Philadelphia) employ CS or CN gas devices but are in the process of switching over to the pepper spray. The remaining agency (Boston) is currently considering a transition to OC. The Michigan State Police, Wayne County Sheriff Department, as well as many local departments, are also using chemical spray devices.

Clearly, the overwhelming national trend is the use of chemical spray devices as intermediate weapons. All ten of the largest metropolitan police departments as well as many federal, state, county and local agencies have already adopted chemical spray devices. Their experiences to date with these devices have all been favorable. Departments report that injuries to officers and citizens have been reduced. No medical problems attributed to these devices have been documented. Chemical devices have proven to be effective alternatives to physical force. Since chemical devices can be used from a distance beyond the grasp of a subject, employing them should result in fewer injuries to both officers and citizens and a reduction of excessive force complaints.

Three brands of chemical spray devices were evaluated: Bodyguard (pure 5% OC), Cap-Stun (pure 5½% OC) and Freeze+P (combination 1%CS/1% OC). Use of both brands of OC allowed the subject to continue moving without incapacitation. While the subject could not see, he could physically resist or assault the arresting officer. Further, the subject could panic and run from the arresting officer while still unable to see, causing injury to him or herself. Only the Freeze+P so incapacitated the subject that he could not or did not want to move or resist. Therefore, the pure OC devices were eliminated from further consideration.

Freeze+P is currently approved for use by the department's Special Response Team. It is also used by the Michigan State



Police, Wayne County Sheriff, as well as many suburban departments. Additionally, the cities of Southfield and Warren intend to begin using Freeze+P in the near future.

Freeze+P is manufactured by Aerko International, 516 NE 34th Street, Fort Lauderdale, Florida. It is distributed locally through Aerko International Michigan Inc. by Mr. Richard Fassett.

The product is nonflammable containing a combination 1% CS (tear gas) and 1% OC (pepper spray). The CS and OC combine together to produce a better overall effect than would be the case if used separately. This synergism allows the manufacturer to use a relatively weaker solution of each agent.

Freeze+P contains CS crystals in liquid solution which enhances the evaporation rate. Because evaporation is accelerated, the effects of the CS agent rapidly dissipate. The other component, OC, also has a rapid dissipation time. As a result, Freeze+P's 2% total solution (as compared to the 5% to 10% solutions contained in pure OC products) allows for a shorter recovery time which minimizes health risks to exposed persons and reduces the risk of cross contamination to the officer.

Aerko Inc. claims that the product has been thoroughly tested by F.D.A. approved labs. The tests disclosed that, although the product causes minor non-persistent eye irritation, it is non-toxic and will not cause dermatitis. The company also claims that the product will not adversely affect the health of persons with heart or respiratory problems.

Freeze+P is an inhalation irritant designed to stimulate facial nerves to cause a feeling of a restricted airway but no danger exists for asphyxiation. A person exposed will feel an intense burning to exposed skin and pain to the mucous membranes of the mouth, nose, and bronchial tubes. The eyes will involuntarily swell and slam shut. The product is reportedly effective against animals and persons under the influence of drugs or alcohol as well as mentally disturbed individuals. The effects are expected to wear off in approximately 20 minutes.

The product also contains an ultra violet dye which is visible under an ultra violet light. The dye cannot be washed off for a period of time, making it possible to rule out false claims by identifying persons who have been exposed.

Aerko Inc. quoted a price of \$9.60 per 2 ounce canister of Freeze+P and \$14.50 for a basket weave leather holster; total cost per officer: \$24.10. It is unknown whether other manufacturers have comparable products or what Aerko's final cost will be after bidding.

Based on the above amounts, the initial cost to the department would be as follows:

The following:  
3,850 Officers @ \$24.10 each = \$92,785.00  
380 Replacement Units (10%) = 9,158.00  
1) A verbal 20 Ultraviolet Lamps = 360.00  
Total Initial Cost: \$102,303.00

2) Except as otherwise directed by the Mayor, the  
Therefore I recommend that the department adopt a chemical spray  
device as an intermediate nonlethal weapon to be issued to all  
members as department equipment.

3) Chemical devices will be authorized for use only for  
The device should contain 1% CS/1% OC with ultraviolet dye  
marker. The canister should contain 2 ounces of agent, utilize a  
streamer delivery system, be clearly marked "Detroit Police  
Department," and contain a non-repeating serial number for  
control purposes. The product "Freeze+P" manufactured by Aerko  
International meets the above criteria.

4) Chemical devices will be authorized for use only for  
Further, ultraviolet lighting equipment should be purchased to  
provide precincts and other specialized commands with the ability  
to screen persons alleging exposure. The ultraviolet light could  
also assist in evaluating instances where the chemical agent did  
not perform as expected since it would document whether there had  
been an adequate exposure.

5) Chemical devices will be authorized for use only for  
If you approve this recommendation, I will direct the appropriate  
departmental entities to prepare the necessary bid specifications  
and directives to implement the program. I also plan a training  
program and believe that a public relations program explaining  
these devices as well as our rationale for using them should be  
undertaken. Listed below are the proposed circumstances under  
which the chemical spray device is authorized:

- 1) Self defense or the defense of others;
- 2) To prevent an attempt, offer, or threat of physical harm with force and violence, where the person has an apparent present means of carrying out the attempt or threat (these elements comprise the crime of assault);
- 3) To effect the arrest of a person physically resisting lawful arrest;
- 4) To restrain a person attempting to flee from custody or to recapture one whom the officer has arrested;
- 5) To prevent a person from injuring him or herself;
- 6) To restore and maintain public order in crowd control situations when directed by competent authority;
- 7) To repel or control attacking or menacing animals.

The policy will also contain the following:

- 1) A verbal warning will be required prior to using the device, if feasible;
- 2) Except as otherwise directed by a ranking member, the person against whom the chemical device was intentionally directed will be arrested;
- 3) Chemical devices will be authorized for on-duty use only;
- 4) Department issued chemical devices will be carried by trained personnel only;
- 5) Only department issued or approved equipment, i.e., baton or chemical spray device, will be authorized for on-duty use. All other impact tools, i.e. blackjacks, sap gloves, etc., will be prohibited.
- 6) Generally, flashlights will be carried as illumination tools only. A flashlight shall not be used as an impact tool except in self defense or the defense of others and only under circumstances where there is a significant threat of serious personal injury.
- 7) Blows from an impact weapon shall not be intentionally directed to the head unless the officer would be justified in using fatal force under the circumstances.
- 8) Persons exposed to chemical sprays will not be routinely conveyed to a hospital for examination. First aid treatment procedures recommended by the manufacturer, i.e., fresh air, flushing with water, etc., will be utilized. If the symptoms persist longer than 45 minutes or if there are other unusual medical complaints or circumstances, the person will be conveyed to Detroit Receiving Hospital for professional medical treatment.
- 9) Members will prepare a preliminary complaint record whenever a chemical spray device is used. In addition, a "Use of Chemical Device Report" will be completed by a supervisor. Copies of both reports will be forwarded through channels to the Internal Affairs Section for retention.

However, should the person require hospitalization, in addition to preparing the "Use of Chemical Device Report," department procedures regarding injured prisoners will be followed.

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Based on direction from your office, I will submit the policy to the Law Department as well as the city's risk manager for review.

I will await your further direction prior to proceeding with this project. I have also enclosed for your information a copy of the committee report which discusses this subject in more detail. As always, I remain available to discuss this matter at your convenience.

Sincerely,

STANLEY KNOX  
Chief of Police

enclosure