



**League of Minnesota Cities  
Insurance Trust**

145 University Avenue West, St. Paul, MN 55103-2044  
(651) 281-1200 • (800) 925-1122  
Fax: (651) 281-1298 • TDD: (651) 281-1290  
www.lmnc.org

LMCIT RISK MANAGEMENT MEMO

**POLICE USE OF CONDUCTIVE ENERGY DEVICES  
(TASERS®)**

**Introduction**

Tasers® are a Conductive Energy Device (CED) manufactured by Taser International. This document is intended to provide information to police administrators and city officials who are deciding whether or not to equip their officers with CEDs, as well as suggestions for minimizing the risks if CEDs are going to be used.<sup>1</sup>

Used properly, CEDs provide police officers with a safe and effective tool for controlling dangerous behavior and overcoming resistance. CEDs have been used repeatedly to successfully resolve situations in which deadly force would have otherwise been authorized. CED use has resulted in a considerable reduction of arrest-related injuries to both officers and subjects. CEDs should be considered a lower level of force than impact weapons, but a slightly higher force option than chemical sprays.

**Description**

The CEDs discussed in this document are classified as 3<sup>rd</sup> and 4<sup>th</sup> generation conductive energy devices. 1<sup>st</sup> and 2<sup>nd</sup> generation stun systems, commonly referred to as “stun guns,” worked by transmitting pulses of electricity to the subject that acted on the sensory nervous system (the system that carries information from the body to the brain). These devices worked on the basis of pain compliance.

3<sup>rd</sup> and 4<sup>th</sup> generation CEDs use an advanced technology and do not work solely on the basis of pain compliance. These devices affect the central nervous system (the system for command and control). 3<sup>rd</sup> and 4<sup>th</sup> generation CEDs work by essentially hijacking away control of the subject’s muscles. Their electrical discharge overrides any commands issued by the central nervous system and causes contractions of the body’s muscle tissue. The net result is to take away the subject’s physical ability to resist or fight. The Taser® M26 is a 3<sup>rd</sup> generation system, and the X26 is a 4<sup>th</sup> generation system.

**Background**

There are two realities that drive the law enforcement profession’s continuing quest for the “perfect” technology to aid in subduing individuals. The first is that officers are sometimes bound by their duty to arrest and bring certain individuals into custody. The second is that some

<sup>1</sup> The term “conductive energy device” or “CED” is used to refer to the general class of electronic incapacitation devices. “Taser®” refers to CED products marketed by Taser, International. While LMCIT does not endorse any particular product, it bears emphasizing that the testing and studies to date have involved Taser® devices, and it may not be accurate to generalize these findings to CEDs marketed by other companies.

unknown percentage of those individuals will resist, either passively in an effort to make the arrest more difficult, or aggressively in an effort to harm the arresting officers. In simplest of terms, sometimes there is no alternative but to use force, and both officers and arrestees end up getting hurt as a result.<sup>2</sup>

CEDs are the latest advance in this quest for a safe and effective arrest technology. They have grown in popularity with law enforcement agencies across North America and throughout many parts of the world. This popularity is understandable because the devices are highly effective in helping officers achieve control over violent and resistive subjects while posing a very low risk of injury to the individual arrested. Law enforcement agencies have reported notable declines in injuries to officers and arrestees once CEDs are introduced.

There has, however, been no shortage of controversy surrounding the Taser's introduction. Reports in the media have been critical of the manufacturer's pre-market testing, Amnesty, International has weighed into the debate, and there have been claims that upwards of 70 deaths were "associated with" police use of the device.<sup>3</sup> Since those reports, however, detailed scientific and medical studies have been undertaken, and these studies have largely debunked claims that CED use has been a primary cause of death for individuals who have perished while in police custody. Rather, current scientific and medical research indicates that when used according to appropriate guidelines, CEDs generally present a very low risk of danger to the subject.

It is up to each city to decide whether or not to equip its officers with these devices. This document is intended to present objective information to aid in making that decision, and suggestions for managing the risk if your city elects to have CEDs. While this information provides a valuable framework and starting point, it is also important that agencies considering or already using CEDs remain watchful for further developments in the research. Additional studies are already underway, the results of which will likely deepen our understanding of the safety and effectiveness of these devices.

### **The framework for evaluating use of force tactics and technologies**

Each compliance option available to officers has two essential characteristics: Its effectiveness and its propensity for harm – stated differently – how much it helps the officer acquire control over the subject and how badly it harms the subject. Firearms are generally very effective in stopping a threat, yet this effectiveness comes combined with a very high propensity for causing death or serious injury. At the other end of the spectrum, efforts to talk someone into custody will not result in much harm, but will be entirely *ineffective* with a noncompliant individual. An

<sup>2</sup> From 2001 through 2004, LMCIT recorded 91 police injuries attributed to dealing with "persons in the act of a crime," costing Minnesota cities approximately \$2.35 million. This constitutes approximately 21% of all police injuries and 24% of all police workers' compensation loss costs for the period.

<sup>3</sup> It is very important to appreciate the exact terminology used in these claims. To say that CEDs were "associated" with deaths in police custody is *not* to say the devices *caused* deaths. Rather, "associated with" means that use of the device was one event occurring in the chain of events taking place prior to the death of an individual in police custody.

optimal tool for law enforcement is one that combines a high degree of effectiveness with a low propensity for injury. The issue of whether CEDs are a good idea for law enforcement thus boils down to a few basic questions. Are they effective? How much harm are they likely to cause to the subject? How do their characteristics for effectiveness and harm compare to other force options?

A review of several pilot studies of the Taser®, summarized below, indicates that these devices are generally very effective in helping officers achieve control over an arrestee. In many cases an officer's mere display of the device is sufficient to overcome an individual's willingness to fight or resist.

Reason suggests that CEDs may be the most effective means for dealing with individuals who are significantly less responsive (or non-responsive) to pain as a result of drugs, alcohol, or mental illness. Many intermediate force options currently available to police rely largely on the application of pain to overcome an individual's *will* to resist an officer. In other words, the reason people stop fighting or resisting – after being struck with a baton, hit with a bean bag round, or sprayed with a chemical agent – is because they can't think about much other than how badly they hurt, or because they want to avoid experiencing additional pain. But for individuals who are non-responsive to pain, the effectiveness/harm characteristics of pain-based techniques can become reversed; more and harder baton strikes will cause more injury without making a corresponding amount of headway toward achieving control. The advantage offered by CEDs rests on the fact that they are not dependent on pain response for their effectiveness. Rather, they override an individual's *physical ability* to resist.<sup>4</sup> Because CEDs are effective without regard to an individual's tolerance for pain, they fill an important void in the officer's tool kit.

There are two issues to consider under the heading of safety. The first is what might be termed "overall" safety. The pilot studies summarized below indicate that CED use reduces arrest related injuries to officers and subjects and has alleviated the need for deadly force in many encounters with armed individuals.

The second issue, despite the increase in overall safety, is whether CEDs pose a risk of serious "side effects" to some individuals some of the time. There has been (and perhaps never will be) a definitive scientific declaration that the devices are 100% safe. But current scientific and medical studies provide substantial evidence that the devices present a very low risk of danger to healthy individuals. Organizations have called for more research to determine whether drug impaired or mentally ill individuals are at greater risk, recognizing that there are still some unanswered questions in this area. Medical professionals who have thoroughly studied the issues believe that if these individuals are at heightened risk, the risk stems from multiple applications of electrical energy. To address this risk, law enforcement officers should generally limit the duration of electrical discharge cycles to no more than 15 or 20 seconds.

---

<sup>4</sup> Tasers® can also be used in a "stun" mode, in which they function as a pain compliance device.

## **Pilot study results**

This section summarizes the results of several pilot tests of CEDs conducted by law enforcement agencies and organizations.

### *Columbus Ohio Police Department (July 5, 2005)*

- 140 Taser® deployments in probe mode, 132 deployments in stun mode<sup>5</sup>
- Probes missed their target in 20 cases, most commonly when fired during foot chases
- In the 120 cases where the probes were on target, the device was 89.2% effective in bringing about control or resolution (in the other 10.8% of cases, thick clothing was cited as the reason for ineffectiveness)
- In 55% of the uses, the individual was emotionally disturbed or under the influence of drugs or alcohol
- Excessive force complaints declined 25.3% after implementation of the Taser® program
- Injuries to arrested subjects declined 24.1%
- Injuries to officers declined 23.4%
- The devices were used in 14 incidents in which deadly force would have been justified and were credited with preventing suicides in 12 of these

### *Seattle Washington Police Department (August 17, 2004 fact sheet)*

- 570 Taser® deployments
- Tasers® credited with achieving control or resolving the situation in 81% of the cases in which they were deployed
- “Injuries to subjects and officers are low in taser deployments when compared with other use of force situations”
- 71% of the people on whom Tasers® were used were impaired by alcohol, mental illness, or delusion
- 23% of the people on whom Tasers® were used were armed. Of those who were armed, 42% had knives, 17% had guns, and 41% had other weapons that included scissors, broken bottles, pipes, shovels, stakes, and hypodermic needles

### *Cincinnati Police Department (July 2004)*

- Over 300 Taser® deployments
- Arrest related injuries to officers down 70%
- Suspect injuries down 40%
- Use of force by other traditional means dropped 50%
- Decrease in citizen complaints arising from use of force

### *Madison Wisconsin Police Department (pilot program in summer of 2003)*

- 92 Taser® deployments
- Successful in producing incapacitation 77% of the time

---

<sup>5</sup> “Probe mode” means the officer fired the probes at the individual. “Drive stun mode” means the officer did not fire the probes, but rather manually brought the device into contact with the subject. Used in the probe mode, the device characteristically overrides the subject’s central nervous system. Used in the drive stun mode, however, the device functions essentially as a pain compliance tool.

- Taser® was used six times to subdue suspects whose actions would have justified the use of deadly force
- Reduced injuries to officers and subjects and reduced utilization of deadly force

*Toronto Police Service (pilot study April 1 to September 30, 2004)*

- Taser® was present and activated in 92 incidents during the six month study
- In 65% of all incidents, the presence of the device contributed to a successful resolution without being used
- The device was effective in 88% of the incidents in which it was actually used
- 34% of the incidents involved armed individuals (7 knives, 2 hammers, 1 axe, and 1 ice pick)

*Orange County Florida Sheriff's Office (with Florida Gulf Coast University)*

The focus of this study was to identify the effectiveness of lower lethality options and examine the potential for force escalation associated with each option.

- Bean-bag rounds produced injuries in 80% of deployments, mostly bruises and abrasions
- With bean bags, eight deaths in 373 employments
- Impact weapons (batons) produced blunt trauma injuries
- Very high potential for escalation of resistance if they were not immediately effective
- Chemical agents had very low associated injury rate
- Chemical agents had a reported failure rate of 12% in this study, which was lower than reported in other studies
- Conventional hand-to-hand techniques were ineffective 29% of the time
- These techniques resulted in the largest number of subject and officer injuries
- Taser® was effective 77-95% in of the cases studied
  - Failure rate with specialized units was 11%
  - Failure rate with patrol was 22%
  - Speculation – specialized units deployed Taser® earlier in an event, providing less opportunity for the subject to move out of range
- Taser® had the highest level of de-escalation (subjects were less likely to fight harder against an arrest after use)
- Taser® had the highest deterrent effect; people were less likely to resist or fight once they were aware the device might be used
- 50% decrease in workers' compensation claims relating to "arrest injuries"
- One death was "associated with" 870 deployments studied
- Taser® was used 18 times in a one-year period to subdue subjects in circumstances in which deadly force was warranted

Canadian Police Research Centre (August 22, 2005)

The Canadian Police Research Centre reports the following conclusions are typical for CED pilots:

- Reduced injuries to police officers
- Reduced injuries to persons who are resisting arrest
- Reduced use of lethal force
- Reduced use of other force options

The Canadian report summarizes these findings by saying that “[p]roper training and use of CED has [been] demonstrated to reduce the risk of harm to both police officers and suspects.”

### **Summary of medical and scientific research**

Some background is helpful to understand the recent focus of medical research on CEDs. Unlike a new drug or medical device that undergoes rigorous testing and evaluation under FDA standards, the most recent generation of CEDs arrived on the streets with a relatively scant resume of scientific and medical references. At the same time, the population of individuals whom the police are called upon to arrest has continued to include those who are already in a medical danger zone. Cocaine and methamphetamine are known to compromise cardiovascular function and can lead to a life-threatening cardiac event whether or not the police are involved. There is a growing understanding that excited delirium, a condition characterized by bizarre behavior, incoherent shouting, superhuman strength and imperviousness to pain, can result in death notwithstanding the tactics officers use to bring the subject under control.<sup>6</sup> Historically, in-custody deaths were occurring before the most recent generations of CEDs were introduced, and they have continued to occur since that time whether or not CEDs were used. Members of the scientific community have called for more study into the phenomenon of in-custody deaths, recognizing that despite the importance we have only a fledgling understanding of the issues.

With this as background, the most pressing question facing researchers has been whether CEDs were causing deaths. The first line of inquiry has been whether the devices deliver a heart-stopping electrical shock. The next area of inquiry is whether use of the devices causes or contributes to other medical complications.

The Canadian Police Research Centre (CPRC) and the British Columbia Office of the Police Complaints Commissioner both issued reports addressing the medical safety of CEDs in the summer of 2005. The CPRC report summarized the findings and opinions emanating from 15 medical and scientific studies of CED safety, concluding: “*Existing studies indicate that the risk of cardiac harm to subjects from a CED is very low,*” and that there is no “*definitive research or evidence*” indicating the use of CEDs have caused death.

There is general medical agreement that the effect is *immediate* when an individual comes into contact with a fatal electrical shock. It follows that when an in-custody death occurs minutes or

---

<sup>6</sup> For more information on this topic, please refer to “Law Enforcement Responses to Excited Delirium” (available at [www.lmnc.org/pdfs/LMCITMemos/ExcitedDelirium.pdf](http://www.lmnc.org/pdfs/LMCITMemos/ExcitedDelirium.pdf))

hours after a CED application, then death didn't occur as a result of a heart-stopping shock from a CED. Dr. John C. Butt, MD, who served on the Medical Review Panel for the British Columbia study, summarized the medical issues thusly:

There seems to be general agreement that in but one or two circumstances, most notably persons with pacemakers, the electrophysiology of the normal heart *would not* be affected by discharge of the Taser shock/energy when the weapon is used properly [emphasis in original].

The CPRC study concluded that the “[e]xisting studies indicate that risk of cardiac harm to subjects from a CED is very low.”

The next area of inquiry is whether CEDs cause or contribute to other medical complications. This question takes on importance when dealing with individuals whose systems are already compromised by excited delirium, drug use, or the exhaustion that follows from prolonged physical struggles. CEDs cause muscle contractions. It is theorized that discharging through probes placed at the upper torso interferes with normal respiration. Additionally, not unlike other intense physical activities, CED-induced muscle contractions produce physiological ripple effects in the body.

The question, as presently framed by researchers, is whether *multiple* CED applications might somehow contribute to a serious medical problem in individuals who are already medically compromised. The physiology and medical implications are not yet fully understood. While the medical issues may be complicated, the medically endorsed recommendations to mitigate this risk are straightforward: Limit the number of multiple applications. Unless there are compelling reasons to the contrary, CED use should not exceed fifteen to twenty seconds.

### **Placement of CEDs on the Force Continuum**

Force options are generally thought of as falling along a continuum from least severe to most severe.<sup>7</sup> Law, departmental policies, and societal expectations generally converge to prohibit officers from using more force than is reasonably necessary in the circumstances. How does one go about deciding whether option “A” constitutes “more force” than option “B?” Force options are ranked along this continuum by comparing how much harm they are likely to cause the subject. Thus it follows that shooting someone with a firearm is considered a more severe use of force than striking an individual with a baton, and a baton strike is considered a more severe use of force than spraying someone with a chemical agent. This ranking of options along the continuum does not answer the question of how much force an officer may lawfully use in a particular case. That question can only be answered through a detailed examination of all of the facts and circumstances. To summarize:

- The law says officers should use no more force than is reasonably necessary
- The force continuum helps answer which is more and which is less

---

<sup>7</sup> The force continuum is not a legal standard, but instead refers to a method for thinking about force options and responses and is commonly used in police officer training for those purposes.

- Officers must rely on their training and judgment to decide which force option is most appropriate in a particular situation. Attempting to use too little force can be futile and ultimately result in more injury to the officer or the subject, while using too much force can result in unnecessary injury and liability.
- Officers must often make the decision about how much force to use in circumstances that are tense, uncertain, and rapidly changing.

Law enforcement agencies should consider carefully where CEDs will be placed in their own force continuum. As an obvious starting point, CEDs are not likely to cause death or great bodily harm, and thus should not be classified as deadly force. The more interesting questions are how CEDs compare to other intermediate force options. By contrasting the harms caused by CEDs against other force options, one is able to approximate where CEDs should be placed on the continuum.

CEDs versus batons, impact weapons, and impact techniques. Baton strikes and bean bag rounds involve the application of blunt force trauma, as do kicks and punches delivered by police officers in hand-to-hand encounters. In the best of typical applications, (delivery to a muscular area of the body), one should expect that their use will cause injury in the form of substantial bruising at the impact site, with a recovery period measured in days or weeks. The Orange County study further indicates that if baton strikes are not immediately effective, there is a substantial possibility the subject will increase his or her level of resistance. The harm caused by CEDs will usually be substantially less. This strongly suggests that CEDs should be placed lower on the continuum than impact weapons and techniques.

CEDs versus chemical spray. When effective, chemical spray causes intense pain to the individual. The pain will persist until the contaminant is gone, which may take hours. By contrast, the disturbance caused by CEDs terminates substantially once the electrical discharge cycle is over. Although there is no basis for objectively comparing the amount or degree of pain or disturbance delivered by the two devices, the period of time over which the subject experiences intense pain will be substantially shorter with CEDs.

However, the August, 2005 report from the CPRC identifies an additional consideration that weighs in favor of classifying CEDs as a slightly higher level of force than chemical sprays. The CPRC reported that “[d]epending upon the time, duration, and skin type of the individual, second-degree burns are likely from a CED application. Research indicates that long-term superficial damage to skin (i.e. permanent scars, short-term burn marks) is possible, and this is more prevalent in dark-skinned individuals.” The conclusion this suggests is that CED use is more likely to result in demonstrable short-term injury and occasional long-term injury than chemical spray. The most prudent position would be to place CEDs slightly higher on the continuum than chemical spray.

It is imperative to note, however, that these one-dimensional comparisons *do not* answer the more pressing question of which use of force option an officer should use in a given set of circumstances. In considering the use of chemical spray, for instance, one must keep in mind



that there is a long list of potential contraindications including wind conditions, contamination of other officers, self-contamination, overspray onto other individuals, pain tolerance, etc.

### **Risk management considerations for CED use**

The following suggestions are offered to help cities minimize the risks of using CEDs:

1. Involve the city council in deciding whether the police department will have CEDs, or at least make sure the council is aware that CEDs are going to be acquired. This involvement on the front-end offers several benefits. First, the council can serve as a valuable barometer of community reaction. Second, it allows the council to weigh-in on CED issues while they are more abstract, rather than the council being confronted by CED issues for the first time after an emotionally charged incident has occurred. Finally, there is value in making sure that council members are fully informed and have a chance to have their questions and concerns addressed before they find themselves needing to respond to media or citizen inquiries about CEDs.
2. If opting for a Taser® product, strongly consider the X26 rather than the M26. The M26 uses 18-26 watts of power to incapacitate a subject. The X26 has a digital pulse controller and uses only 7-11 watts, thereby increasing the margin of electrical safety.
3. Training protocols should reflect that multiple applications, particularly continuous cycling for periods exceeding 15-20 seconds, may increase the risk to the subject and should be avoided when practical. (If the CED hasn't worked in achieving control after 15-20 seconds, the officer should reassess and consider another force option or disengagement.) On the other hand, continuous cycling may be a very prudent choice when the apparent alternative is escalation to force, likely to result in serious injury or death.
4. Policy and training should provide guidelines for when to use CEDs in the probe mode and when to use them in the drive stun mode.
5. If you're going to use a CED, do so before everyone is exhausted. At the outset, prolonged struggles heighten the risk to both the officer and the subject. One theory recently recognized as medically plausible is that CED use essentially accentuates the negative physiological effects of physical exhaustion. Additionally, discharging through probes on the upper torso could impair a subject's breathing, and respiratory impairment becomes of particular concern when CEDs are used during, or at the end, of a prolonged struggle. To minimize these risks, consider using a CED as soon as it becomes apparent that arrest needs to occur and that lower level force options are unlikely to work or are otherwise contraindicated.
6. Pregnancy contraindicates CED use because of the risk of miscarriage. With pregnancy, CED use is clearly preferable to a firearm if the situation warrants deadly force, but is less justifiable if the situation does not require a firearm.

7. Try to avoid discharging through probes placed on the head. There is some evidence to suggest that electrical outputs delivered to the head are capable of producing seizures.
8. Carefully consider the ramifications of CED use on children and the elderly. First, people with smaller bodies have a lower margin of safety with regard to electrical currents, although one animal study suggested there was still an ample safety margin even with a 66-pound body. Secondly, it would be imprudent to ignore the potential for public backlash if using the device against the very young or the very old. It may be more difficult to convince a judge or jury that CED use was reasonably necessary against an individual who appears to be physically frail or incapable of offering much resistance. On the other hand, blanket prohibitions may expose officers and others to unreasonable risks of danger due to the alternatives.
9. Carefully consider whether to use CEDs on officers as part of training. As observed above, CEDs reduce injuries in arrest situations. But officers have still reported occasional injuries as a result of CED discharges during training. On the other hand, there is also a rational argument to the contrary: Officers are better equipped to defend their use of the device on the witness stand if they have themselves experienced CED incapacitation. While there is no clear solution to this dilemma, it is nonetheless one that should be recognized and resolved thoughtfully.
10. As with other force transactions, it is imperative that officers prepare accurate and detailed reports of CED uses. Reports should document the circumstances leading to the CED use, including the failure or apparent futility of trying lower-level compliance options. Officers should document any verbal commands given, the subject's response, as well explaining why the CED was selected instead of other less severe force options. Reports should further detail where the probes struck the individual, an approximation of the number of cycles delivered, and how the situation was resolved.

### **Conclusion**

CEDs provide police officers with a safe and effective tool for controlling dangerous behavior and overcoming resistance, and using them has resulted in a considerable reduction of arrest-related injuries to both officers and subjects. For more information, contact the League of Minnesota Cities Insurance Trust, Bill Everett, at 651-281-1216.

William J. Everett 10/2005