



Bureau of Professional Development

AN OVERVIEW OF ELECTRONIC CONTROL DEVICES AND THEIR USE IN FLORIDA

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INTRODUCTION

Electronic Control Devices (ECDs) are commonly called tasers or stun guns. However, the name “Taser” is the brand name of weapons that immobilize a victim using short bursts of electricity via barbed darts on a wire that can extend up to 21 feet away. Holding down the trigger allows the user to deliver repeated shocks. “Tasers” also have a stun gun feature that requires removal of the dart cartridge and then holding the weapon directly against the victim. ECDs, in particular TasersTM, have become popular with law enforcement agencies because they allow officers to subdue a person from a distance and then ideally, capture the person without loss of life or injury to the officer or the person. Other terms used in reference to these devices are Electronic Control Weapons (ECW) and Electro-Muscular Disruption Technology (EMDT).

Throughout this report, the terms stun guns, TasersTM, ECDs, ECW and EMDT are used interchangeably.

PURPOSE AND SCOPE

Much controversy has surrounded TaserTM use and much has been written about the devices. In addition, information has been developed and presented at various professional law enforcement forums on the subject of TasersTM. The purpose of this document is to take a look at how Florida law enforcement agencies, Florida lawmakers and other professional organizations are trying to close the gap between safety expectations and the realities of stun gun or TaserTM use as a non-lethal alternative to force.

The scope of this ECD project is very broad because of the inter-related issues associated with the use of the devices. Because the myriad works are not identified and summarized in one place for easy reference, the intent of this work is to provide a quick and easy resource guide to the law enforcement community on Electronic Control Devices.

This document will list and briefly summarize the findings and recommendations of a significant number of studies and reports, and applicable case law. Also presented will be several recommendations or best practices of professional organizations and some new technology that is sure to be of interest to the law enforcement community.

METHODOLOGY

The information contained in this report was compiled after conducting extensive internet research and a review and summary of reports and studies, along with findings and recommendations. Included in the research effort were reviews of pending Florida legislation; daily newspaper articles on TasersTM; professional journals; and materials from the 2005 High Liability Trainers Conference including relevant court cases and citations, sample ECD policies and interviews with FDLE personnel involved with the development and delivery of the 2005 High Liability Conference.

FINDINGS

Generally speaking, all of the manufacturers take the position that their stun gun products are a non-lethal alternative to the use of deadly force by law enforcement officers. Each touts its product’s safety features

and competitive advantages and offers some type of training to accompany its wares. But, none have escaped the controversy that has surrounded stun gun use particularly with regard to risk factors and the circumstances that lend themselves appropriately to stun gun use. Several companies manufacture stun gun devices; they are described below.

TASER International

The company that has dominated the market among the law enforcement community is TASER International, Inc. based in Scottsdale, Arizona with its brand name TASER™. The TASER™ is a two-dart device which can also be used in the “touch stun” mode without firing the darts.¹ Several models are available however, two of the models are only available to law enforcement and the military.

TASER International describes all TASER™ brand devices to be “non-lethal” as defined by the Joint Concept for Non-lethal Weapons, United States Marine Corps.² Company publications refer to extensive testing of the devices citing particularly a study by the Human Effects Center of Excellence (HECO) which concluded that this technology is “generally effective without significant risk of unintended results”. Further, TASER, Inc. indicates that there has never been a published study that has conclusively linked TASER™ devices as the direct cause of a fatality.³

Law Enforcement Associates Corporation

Law Enforcement Associates, Inc. (LEA) headquartered in Youngsville, N.C., introduced its LEA Stun Pistol™ in March 2005.⁴ LEA Corporation is a surveillance and security technology company that unveiled the LEA Stun Pistol™ for sale only to law enforcement. Safety of the product relies principally on a technical report prepared by an engineering firm that concluded “shocks from the LEA Stun Pistol™ are well below the ventricular fibrillation threshold established by the International Electrotechnical Commission (IEC) standard 479-2”. The IEC establishes safety thresholds for shocks from manufactured equipment.⁵

Stinger Systems, Inc.

Stinger Systems, Inc. based in Tampa introduced a four-dart stun gun to law enforcement agencies called the STINGER™ in October 2005^{6, 7}.

¹ Florida Senate PCS/SB 214 “Dart Firing Stun Guns” Senate Staff Analysis and Economic Impact Statement [Online] 3 November 2005. URL <http://www.flsenate.gov/data/session/2006/Senate/bills/analysis/pdf/2006s0214-pcs.cj.pdf>.

² TASER (training) CD Version 12.0, TASER International, Inc. November 2004)

³ *TASER Medical Safety Information, TASER International, Introduction by Dr. Jeffrey Ho, Nov. 8, 2004)*

⁴ TMCnet News. “Law Enforcement Associates Successfully Introduces Its Production, Less Lethal STUN PISTOL at the Trexpro Conference”. [Online] 23 March 2005. . URL <http://www.tmcnet.com/usubmit/2005/Mar/1127855.htm>.

⁵ Felper, Jerry, *Comparison of Average Shock Value or LEA Stun Pistol to Applicable Safety Standard*. [Online] 25 March 2005. URL <http://www.leacorp.com/lesslethal.asp>.

⁶ *Stinger Systems Press Release: “Stinger Systems, Inc. Announces Initial Sales and Volume Production of the Stinger Projectile Stun Weapon”*. [Online] 10 October 2005. URL <http://www.stingersystems.com/press.htm>

⁷ Florida Senate PCS/SB 214 “Dart Firing Stun Guns” Senate Staff Analysis and Economic Impact Statement [Online] 3 November 2005. URL <http://www.flsenate.gov/data/session/2006/Senate/bills/analysis/pdf/2006s0214-pcs.cj.pdf>)

In addition to superior standard features including greater range, target attainment and price, Stinger, Inc. claims that a manual trigger allows an officer to maintain control during the entire arrest process. According to Stinger, the manual trigger may also limit liabilities departments potentially face because they no longer have to pass a current through a complying suspect for a predetermined length of time.

Stinger Systems, Inc. has commissioned independent medical studies of its products through Wayne State University. The studies will focus on cardio, pulmonary, lactic acid and drug induced states.⁸

What is the State of Florida doing to address the controversy surrounding the introduction of ECD technology into law enforcement agencies?

Because police are increasingly using ECDs as an alternative to other means to subdue suspects, the Florida law enforcement community and the Legislature have stepped up efforts to train officers, and to govern the use of this increasingly popular law enforcement tool.

Specifically, by mid 2006, Florida will have held two conferences on the subject in addition to passing legislation to govern the use of ECDs.

Conferences

- The 2005 High Liability Trainers Conference was presented in Orlando, FL in August 2005 and was sponsored by the Florida Criminal Justice Standards and Training Commission. This conference presented relevant court cases; the Sample ECD policy; Taser™, ECW or Use of Force policies of three Florida law enforcement agencies; and featured a presentation on Excited Delirium.⁹
- A Taser Symposium entitled “In-Custody Sudden Deaths” will be presented on June 1, 2006 in Orlando, FL featuring Dr. Vincent J.M. DiMiao, Chief Medical Examiner, Bexar County, San Antonio, TX; Theresa G. DiMaio, BSN, RN (author), Dr. Theodore Chan, Medical Director, Emergency Management, University of California and Metropolitan Strike Team Medical Director, County of San Diego, California; and other panelists from around the state of Florida. This symposium is being presented by the Florida Sheriffs Association in partnership with the Florida Department of Law Enforcement, and The Florida Police Chiefs Association.

Legislation

CS/CS/SB 214 (Passed the Legislature May, 2006)

- Deletes the term “remote stun gun” for the purposes of Ch 790, F.S. Defines the term “dart-firing stun gun” to mean “any device having one or more darts that are capable of delivering an electrical current”. (Ch. 790.001 (15) F.S.)
- Amends 790.01 and 790.053, F.S. conforming provisions to the change in definition made by the act to authorize the carrying of a dart-firing stun gun for purposes of lawful self-defense;
- Amends 790.054, F.S.; providing that it is a third-degree felony to use a dart-firing stun gun against an on-duty law enforcement officer;
- Sets forth the circumstances under which a law enforcement officer, correctional, or correctional probation officer may use a dart-firing stun gun; specifically requiring that the decision to use the device must involve an arrest or custodial situation during which the person who is the subject of the

⁸ Stinger Systems, Inc., *THE STINGER™ The Four Dart Hand-Held Projectile Stun Gun*. [Online] URL <<http://www.stingersystems.com/stinger.htm>

⁹ High Liability Conference 2005. [Online] August 2005
URL<http://www.fdle.state.fl.us/cjst/Training_Resources/Taskforces_Conf/presentation_materials/TaserMaterials.htm

arrest or custody escalates resistance to the officer from passive physical resistance to active physical resistance and, a) the person either has the apparent ability to physically threaten the officer or others, or b) is preparing or attempting to flee or escape.”

- Requires the Criminal Justice Standards and Training Commission to establish training standards for instruction on the use of the dart-firing stun guns; requires Basic Skills Training for a minimum of 4 hours in duration and annual training requirements for a minimum of 1 hour in duration.¹⁰

Policies

The Florida Taser Advisory Group developed a Sample ECD Policy to guide law enforcement agencies. The Orange County (FL) Sheriff’s Department developed an ECW Policy; the Miami Police Department developed a Taser Policy and the Leon County Sheriffs Department developed a Use of Force Policy that covers the use of Tasers™. These local agency policies were presented at the High Liability Conference in August 2005.¹¹

A work group was also commissioned by the Florida Police Chiefs Association to develop a model standard for police departments for the use of Electronic Control Devices (ECDs). The Recommended Standards for Electronic Control Device Policy was presented to the Executive Board in November 2005 and is published in the Florida Police Chief Magazine.¹²

Relevant Court Cases

The following court cases are cited on the website of the 2005 High Liability Trainers Conferences:¹³

Graham vs. Conner

In the case of Graham vs. Conner, 490 US 386 (1989), it was decided that all claims that law enforcement officers have used excessive force (deadly or not) in the course of an arrest, investigatory stop or other seizure are analyzed under the Fourth Amendment’s objective reasonableness standard.

Regarding the matter of objective reasonableness, the court will consider the following: The severity of the crime; whether the suspect poses an immediate threat to the safety of the officers or others; whether the suspect is actively resisting arrest or attempting to evade arrest by flight. In addition, the court acknowledges that the right to make an arrest carries with it the right to use some degree of physical coercion or threat thereof. Graham at page 396.

The calculus of reasonableness must embody allowance for the fact that police officers are often forced to make split second judgments in tense and uncertain and rapidly changing situations. Graham at page 396.

¹⁰ CS/CS/SB 214, 2nd Engrossed.

<http://www.myfloridahouse.gov/Sections/Bills/billsdetail.aspx?BillId=31685&SessionIndex=-1&SessionId=42&BillText=&BillNumber=&BillSponsorIndex=0&BillListIndex=0&BillStatuteText=&BillTypeIndex=0&BillReferredIndex=0&HouseChamber=H&BillSearchIndex=3>

¹¹ High Liability Conference 2005. [Online] August 2005 URL

http://www.fdle.state.fl.us/cjst/Training_Resources/Taskforces_Conf/presentation_materials/TaserMaterials.htm

¹² Sireci, Paul F., “Electronic Control Devices”. *The Florida Police Chief*. (Winter 2006-2006) 65-71

¹³ High Liability Conference 2005. [Online] August 2005 URL<

http://www.fdle.state.fl.us/cjst/Training_Resources/Taskforces_Conf/presentation_materials/TaserMaterials.htm

Draper vs. Reynolds

The 11th Circuit Court of Appeals has established law on use of the Taser™ in the case of Draper vs. Reynolds 369 F3d 1270 (11th Cir. 2004). This opinion is the first Taser case in the 11th Circuit and only deals with a one time shock with the Taser™. Other related situations are not clearly established by this case law.

The issue on appeal related to a traffic stop during which there was a need to handcuff the plaintiff. Regarding the reasonable application of force, the court noted that a number of facts should be examined including the following: the need for the application of force; the relationship between the need and the amount of force used; and the extent of injury inflicted. The Court concluded that without the use of the Taser™ during the traffic stop, the situation at hand would have escalated into a serious physical struggle.

Thornton vs. City of Macon

In the case of Thornton vs. City of Macon, 132 f3d 1400 (11th Circuit 1998), the court spoke to the entitlement of an officer to qualified immunity from suit if their actions were “objectively reasonable”. That is, if a reasonable officer in the same situation would have believed that the force used was not excessive.

Mitchell vs. Forsyth

In the case of Mitchell vs. Forsyth, 472 US 511 (1985), the court said even if the case factually shows a constitutional violation occurred, the officer or governmental actor still has qualified immunity unless they violated “clearly established” law.

Hope vs. Pelzer

In the matter of Hope vs. Pelzer, 536 US 730 (2002), the court said for the law to be considered “clearly established” its contours must be sufficiently clear that a reasonable law enforcement officer would understand that what he is doing violates the law

Studies Conducted on Use of Tasers™

- A. **Cardiac Safety of Neuromuscular Incapacitating Defensive Devices.**¹⁴ and ¹⁵. The study focused on the issue of ventricular fibrillation (VF) and the hypothesis of the researchers was that “the induction of VF would require significantly greater discharge levels than delivered by electrical NMI (neuromuscular incapacitation) devices fielded by law enforcement agencies.” The study utilized adult domestic pigs to simulate human body weights of 66 lbs.-265 lbs.

Findings of the study: The study confirmed the cardiac safety of an experimental NMI device emulating the performance of commercially used devices and demonstrated a safety index strongly correlated with increasing body weight.

This study was almost immediately called into question because one of the researchers, Dr. Stratbucker, was a medical advisor to Taser International.

- B. **Human Effectiveness and Risk Characterization (HERC) of the Electromuscular Incapacitation Device – A Limited Analysis of the TASER™.** This reflects the results of a three-workshop

¹⁴ PACING and CLINICAL ELECTROPHYSIOLOGY (PACE), Vol. 28, Number 1, January 2005

¹⁵ *Taser Technology Review - Final Report*, [Online] British Columbia Office of the Police Complaint Commissioner, OPCC File NO. 2474, June 14, 2005. URL <<http://www.iacp.org/research/rcdcuttingedgetech.htm>>

process with sequential workshops held for data gathering and sharing, peer consultation, and independent external review of the HERC document. The workshops included two devices manufactured by Taser International, the M26 and X26 Taser™.¹⁶

Findings/Recommendations of the study: Overall, the results support the conclusion that the M26 and X26 Tasers™ are generally effective for their intended use. However, they may cause several unintended effects, albeit with estimated low probabilities of occurrence.

- C. **PSDB Further Evaluation of the Taser Devices.** This technical report briefly outlines previous reviews and evaluations of the **M26** model of the Taser™ by the review committee for which it was concluded “that the risk of life-threatening or serious injuries from the **M26** Taser is very low”. After the introduction of the Taser model **X26**, the committee was asked to review and evaluate the new model.¹⁷

Findings of the study: 1) Throughout the testing it was found that the **X26** Taser™ performs marginally better than the **M26** in most areas; and, the **M26** is approximately half the cost of the **X26**. 2) When the medical implications of the use of the **X26** were examined, it was concluded that “the risk of a life-threatening event arising from the direct interaction of the currents of the **X26** Taser with the heart, is less than the already low risk of such an event from the **M26** Taser™”. 3) It was noted that if the **X26** is more effective than the **M26** in stimulating skeletal muscles, as claimed, then there will be a greater likelihood of head injury after contact with surfaces due to the less controlled fall. However, the risk of serious head injury is still considered to be low.

- D. **Efficacy and Safety of Electrical Stun Devices.** Although many law enforcement organizations believe stun gun technology to be safer than other non-lethal and even lethal alternatives, there remains legitimate concerns about the significant electrical surge produced by this technology and the effect it has on the body. This study was conducted to clarify issues of effectiveness and safety of current stun technology.¹⁸

Findings of the study: The study found direct and indirect evidence regarding the safety and effectiveness of stun technology:

Indirect Evidence of Efficacy

- Acquisition of stun devices by law enforcement agencies across the country is increasing substantially.
- Organizations other than traditional law enforcement agencies have actively voiced support for stun device use as a non-lethal option.

Direct Evidence of Efficacy

- Individual law enforcement agency reports offer statistics on situational use and employment results, and a compelling majority of these report favorable success rates, particularly as compared to other techniques and devices.

Indirect Evidence of Safety

- Available animal modeling results offer confirming scientific evidence that the employment of stun technology is relatively safe.

¹⁶ Human Effectiveness and Risk Characterization of the Electromuscular Incapacitation Device – A Limited Analysis of the TASER, Human Effects Center of Excellence, Abstract & Executive Summary. [Online] 1 March 2005 URL <<http://www.iacp.org/research/rcdcuttingedgetech.htm>, 10/11/2005

¹⁷ Wilkinson, David, PSDB Further Evaluation of the Taser Devices [Online] 2005, *Police Scientific Development Branch*. URL >http://www.taser.com/documents/UK_TASER_Report_March_05.pdf

¹⁸ McBride, Dennis K., et al, Efficacy and Safety of Electrical Stun Devices. [Online] Potomac Institute for Policy Studies, Arlington, VA, 29 March 2005) URL <<http://www.iacp.org/research/rcdcuttingedgetech.htm>, 10/11/2005

Direct Evidence of Safety

- Examination of the 72 mortality cases appearing in an Amnesty International 2004 report reveals that in no instance was stun gun employment singularly indicated or implicated as the specific cause of death, although the application of stun devices could not be ruled out as a possible contributing factor.
- Analysis of the 72 mortality cases showed that other contributing factors included pre-existing morbidity, such as heart disease; and other significant factors such as excessive drug ingestion, and multiple force applications (e.g., baton + wrestling + stun).

Recommendations of the study: The study strongly recommends that additional research be conducted at the organism, organ, tissue and cell levels.

- E. **Taser Technology Review & Interim Recommendations.** This interim report dealt with the use of a TASER™ by police in British Columbia. It included: 1) a review of TASER™ technology, focusing on the M26 and the X26 Models; 2) a review of TASER™ usage, in the context of the Canadian Use of Force Model; 3) a review of some of the relevant medical literature; and, 4) a review of restraint related death in British Columbia.¹⁹

Findings of the study: It was suggested that more could be done to ensure uniformity of training across the Province, to provide enhanced levels of accountability, and to decrease the risk to those groups most at risk from sudden and unexpected death associated with restraint, whether or not the TASER™ is used.

Recommendations of the study: Enhancements were recommended in the following areas:

1) *Training* via the creation of standardized lesson plans for users in British Columbia with a “core curriculum” delivered to all recruits and all in-service TASER™ users; 2) *Training* on Excited Delirium via the creation of a standardized lesson plan to be delivered to all recruits as well as all in-service members regardless of rank in the Province; 3) *Mandatory Reporting* via a Use of Force Report that captures relevant information after deployment of a TASER™ for statistical analysis; 4) *Restraint Protocols* in the Province that utilize a Hobble restraint, a wrap restraint or other similar devices instead of the maximum restraint position with handcuffs and ankles bound behind the back.

- F. **Taser Technology Review - Final Report.** Since the issuance of the Interim Report, the focus turned to providing suggested Course Training Standards in the areas of Conducted Energy Devices (CED), Excited Delirium (ED) and Restraint Protocols (RP). The Course Training Standards will be made available upon completion.²⁰

Findings/Recommendations of the study: Several studies were reviewed and certain points were emphasized in the Executive Summary. 1) A study conducted by the Air Force Laboratory (AFRL) is believed to provide support for the proposition that police should, where possible, be minimizing multiple Taser™ applications; 2) The effect that Taser™ application has on respiration remains an area of concern. Muscular tetany that impairs respiration may be an operative factor that has been previously unrecognized. This concern relates to the issue of multiple usages. 3) Life preservation and retrieval in situations where the individual is at high risk of death proximal to restraint requires changes not just to police protocols and procedures, but also the methods used by ambulance personnel and emergency room physicians. These changes require extensive research to ensure they are based on the best available information.

¹⁹ *Taser Technology Review & Interim Recommendations* [Online]. *British Columbia Office of the Police Complaint Commissioner, OPCC File NO. 2474*. September 2004 URL <<http://www.opcc.bc.ca/Reports/2004/Interim%20Taser%20Report%20and%20Recommendations.pdf>>

²⁰ *Taser Technology Review - Final Report*, [Online] *British Columbia Office of the Police Complaint Commissioner, OPCC File NO. 2474, June 14, 2005*. URL <<http://www.iacp.org/research/rcdcuttingedgetech.htm>, 10/11/2005

G. DSAC Sub-Committee Statement on the Medical Implications of the use of the M26 Advanced Taser, This is the first in a series of technical reports issued on Taser™ brand models of ECDs.²¹

Findings of the study: This British study concludes, among other things, that overall the risk of life-threatening or serious injuries from the M26 Advanced Taser™ appears to be very low.

H. DSAC Sub-Committee Statement on the Medical Implications of the use of the X26 Taser and the M26 Advanced Taser. This is another technical report (among a series of previous statements) which compares the outputs of the Taser models X26 and M26.²² and ²³

Findings of the study: The overall conclusion of this study was that the risk of a life-threatening event arising from the direct interaction of the currents of the X26 Taser™ with the heart is less than the already low risk of such an event from the M26 Advanced Taser™.

Recommendations of the study:

- Research should be undertaken to clarify the cardiac hazards associated with the use of the Taser on individuals who could be considered to have a greater risk of adverse effects....;
- Forensic Medical Examiners (FME) and appropriate clinical staff in the principal hospitals within the areas of police forces...should be briefed on the nature of the M26 Advanced Taser™, clinical and operational experiences from North America, and the presumed and known risk factors.

Reports & Papers

I. Excited Delirium and its Correlation to Sudden and Unexpected Death Proximal To Restraint.

The author of this report (a trained police investigator) gathered relevant scientific and medical literature in an effort to clarify issues surrounding an emotionally charged subject that makes it difficult for the general public to understand the cause and effect correlation of sudden unexpected death (during an arrest) and the use of specific force options used by police. Medical disciplines referenced in the report include Pathologists, Psychologists, Psychiatrists, Pharmacologists, Neurologists, Cardiac Electrical Physiologists, and Exercise Physiologists.²⁴

Findings/Recommendations of the report: 1) The causes of death attributed to Excited Delirium proximal to restraint are medically “multi-factoral”; 2) There is no “synthesis” of the scientific and medical opinion from a variety of differing specialties into one document. Each discipline holds a piece of the puzzle to understanding the phenomena of death associated with Excited Delirium; 3) Review of the literature reveals that all of the medical community agrees that Excited Delirium is a “medical emergency”; 4) ...understanding the processes that may be involved and communicating the information to police officers, paramedics and emergency medical teams may enable all to optimize the emergency systems responses to incidents involving people with Excite Delirium; 5) Others who interact with subjects experiencing Excited Delirium should develop protocols specific to Excited Delirium patients. 6) It is suggested that one goal of medical research into Excited Delirium could be to develop a standard protocol for after care with a relevant and needed data collection process, concurrent with developing an after care protocol for human life retrieval; 7) It is also suggested that

²¹ *DSAC Sub-Committee on the Medical Implications of Less-lethal Weapons*, United Kingdom Defence Scientific Advisory Council, December 2002.)

²² *DSAC Sub-Committee on the Medical Implications of Less-lethal Weapons* [Online] 7 March 2005
URL <<http://www.taser.com/documents/DSAC%20DOMILL%20X26%20Statement.pdf>

²³ <http://www.taser.com/documents/UK_DOMILL_med_statement.pdf

²⁴ *Excited Delirium and its Correlation to Sudden and Unexpected Death Proximal To Restraint*, Lauer, Sgt. Darren, Victoria Police Department, November 2004. [Online] November 2004. URL <<http://www.taser.com/documents/Sudden.pdf>

a cogent explanation based on lay terminology and delivered to the public might lessen speculation and mistrust.

- J. **Orange County, FL Sheriff's Office Taser Task Force Report.** The Taser Task Force Committee was comprised of twelve (12) members, five (5) of whom were medical experts who delivered presentations in their respective specialties. Before issuing the report, the committee followed a methodology which included the following: 1) acknowledging concerns voiced by the public by holding a public hearing; 2) seeking to understand Use of Force in criminal justice; 3) conducting concurrent reviews of literature published by other agencies; 4) seeking input from the public school district; 5) reviewing the training curricula for both Taser International and the Orange County Sheriff's Office; and, 6) reviewing and discussing statistical data since implementation of the Taser™ in the year 2000.²⁵

Findings of the report:

- The Human Resources Division reported nearly an eighty percent decrease in officer related injuries over a two year period of time for arrest situations.
- The medical evidence suggests that the Taser™ does not cause any permanent damage to an individual and the use of this particular weapon appears to be safer than that of other weapons commonly used by law enforcement (batons, sprays, and physical arrest techniques).
- Overall, the evidence is overwhelming that Tasers™ are a viable option for law enforcement. It does not suggest that it is impossible for a suspect to be injured in an incident in which a Taser™ is used or that being tased is a pleasant experience. However, the County Sheriff's Office has integrated additional protocols in an attempt to minimize injuries when possible.

Recommendations of the report: The Task Force Committee recommended enhancements in the following areas:

Training: 1) Educating the public regarding accurate facts and figures about taser™ use; 2) Enhancing the training curricula to cover such items as instructor certification, 3) Include use of force issues at re-certification, 4) minimum number of cartridges during "basic user" course, 5) a written examination with minimum 80% score; and, 6) increasing basic user course curricula to 8 hours.

Documentation: 1) capture data that shows how often a deputy pulls his issued Taser™ without utilizing it; 2) share documentation and annual reporting with the community and the agency.

Policy: 1) Develop a separate policy for Taser™ use. 2) Incorporate additional verbiage in the stand-alone policy to further guide deputies in their decision making process during physical encounters.

- K. **Cardiac Safety of High Voltage TASER X26 Waveform.** This paper covers the cardiac safety studies of a high voltage (TASER) less than lethal weapon and outlines the safety margin of the Taser X26.²⁶

Finding of the report: It was inferred from the tests that the risk of inducing ventricular fibrillation by the surface application of a TASER X26 to a human subject is very small.

²⁵ High Liability Conference 2005-Taser Forum. [Online] August 2005. URL

http://www.fdle.state.fl.us/cjst/Training_Resources/Taskforces_Conf/presentation_materials/TaserMaterials.htm

²⁶ Stratbucker, Robert, et al. [Online] 17-21 Sept 2003, Paper: *Cardiac Safety of High Voltage TASER X26 Waveform*, Engineering in Medicine and Biology Society, 2003. Proceedings of the 25th Annual International Conference of the IEEE. URL <
http://ieeexplore.ieee.org/xpl/abs_free.jsp?arNumber=1280839

- L. **Taser X-26 Safety Analysis.** This report should be read in conjunction with the September 2003 report entitled “Advanced Taser M26 Safety Analysis”. The report presents the results of the testing of a sample Taser unit supplied by Australian agents. The theoretical power output of the X26 was calculated and compared with previous results of the M26.²⁷

Findings of the report: 1) The current output of the X-26 is significantly below the fibrillation threshold set out in the Standard. 2) The shaped pulse technology produces an output that is at least equal to that of the M-26 in all cases, but with dramatically improved electrical efficiency compared to previous models. 3) From an electrical safety viewpoint, the device presents an acceptable risk when used by trained law enforcement officers in accordance with the manufacturer’s directions for use.

- M. **Advanced Taser M-26 Safety Analysis.** The Victoria Police commissioned The Alfred to perform an electrical safety analysis of the Advanced Taser M26 “stun gun”. The project was only to examine the electrical safety aspects of the Taser™ (and was not a product endorsement).²⁸

Findings of the report: The conclusion reached is that the current output of the Advanced Taser M26 is below the fibrillation threshold set out in the Standard. From an electrical safety viewpoint, the device presents an acceptable risk when used by trained law enforcement officers in accordance with the manufacturer’s directions for use.

- N. **Final Report of the Miami-Dade County Grand Jury, TASERS: Deadly Force?** The Grand Jury reviewed several questions that appeared to be of greatest concern to Miami-Dade County (FL) residents. The questions to be answered: 1) Were ECDs causing deaths? 2) Are they safe? 3) Have they been sufficiently tested? 4) What policies and guidelines are in place to govern the use of ECDs by law enforcement?²⁹

Findings of the report: Among other things, the grand Jury thinks:

- Given the choice between being stunned, getting up and walking away and being beaten with a baton and risk having bruises and possible broken bones, the use of ECD is the better alternative.
- There should be a ban on the use of ECDs on “small children”.
- Absent exigent circumstances, ECDs should not be used on vulnerable populations such as the elderly, the infirm and pregnant women.
- The Miami-Dade County Association of Chiefs of Police ECD policy is a model and incorporated it by reference in the report.
- To decrease deaths, the report points out an effective treatment option for suspects who are not easily subdued. The treatment is currently being studied and is a fast-acting hypnotic sedative called “Versed” (midazolam).
- Because the sedative qualities of the drug “Versed” may cause some subjects to experience difficulty breathing, fire rescue personnel and EMTs must be alert to this possibility and must be prepared to incubate the subject.

Recommendations of the report:

- That all police departments in Miami-Dade County adopt and enact an Electronic Control Device policy that is, at a minimum consistent with and, at a minimum as stringent as the Dade Chiefs Model Policy.

²⁷ *Taser X-26 Safety Analysis*, The Alfred Hospital, June 29, 2004.

²⁸ *Advanced Taser M-26 Safety Analysis*, The Alfred Hospital, Sept. 22, 2003.

²⁹ State Attorney Katherine Fernandez Rundle, et al, *Final Report of the Miami-Dade County Grand Jury, TASERS: Deadly Force?* SPRING TERM A.D. 2005, Filed February 2, 2006. [Online] [URL <http://miamisao.com/publications/grand_jury/2000s/gj2005s.pdf>](http://miamisao.com/publications/grand_jury/2000s/gj2005s.pdf)

- Whenever possible, Tasers™ should be employed by a team or pair of officers – one employing the ECD and the rest available to restrain the suspect.
- Police departments should continue with the deployment of Tasers™ and that officers receive adequate training on the proper use of Tasers™.
- All police departments in Miami-Dade County that issue Tasers™ adopt policies that require at a minimum:
 - a) Documentation/written reports of every discharge of a Taser™...
 - b) Random testing to ensure that officers are documenting all discharges of Tasers™;
 - c) Severe discipline for any inappropriate uses of a Taser or abusive behavior with the Taser™; and,
 - d) Specified guidelines on target populations for whom Tasers™ should not be used...
- Police officers, EMTs and other “first responders” should be trained to recognize the symptoms of Exited Delirium Syndrome...
- EMTs and Fire Rescue Personnel carry “iced saline” in their rescue vehicles...;
- Studies and testing be accelerated to develop the treatment option of administering Versed via nasal spray.
- Once studies and testing have concluded, EMTs and Fire Rescue Personnel should also have Versed available for use in situations where ECD is identified.
- Law enforcement agencies using Tasers™ and other ECDs demand rigorous independent testing of the devices;
- More scientific studies should be conducted to determine whether persons under the influence of drugs are more prone to suffer adverse and unintended consequences when ECDs are used on them;
- Training officers advise their police officers of the fact that many people who received repeated stuns from an ECD or were under the influence of drugs at the time they were stunned died shortly thereafter.

O. **The Advanced Taser: A Medical Review.** This paper reviews the available relevant literature on electrical injury and describes the likely injury potential of the Advanced Taser™, drawing conclusions on the device’s relative safety and identifies potential medical issues in deploying this product.³⁰

Findings of the report:

- The medical risks of electronic weaponry compare favorably with those of more conventional methods of controlling non-compliant and violent subjects.
- It has been impossible to accurately calculate how much electrical energy the Advanced Taser™ delivers into the body.
- There exists no convincing evidence directly implicating Taser™ weaponry in deaths of subjects in over 25 years experience in America.
- Risk factors for death in ‘tasered’ subjects appear to be no different from known risk factors for death in custody (drugs, exhaustion, bizarre behavior leading to arrest, etc.).
- The risk of harm might well be higher for using the devices on patients with pre-existing heart and neurological diseases; although these risks are largely theoretical and have not been demonstrated in field application or laboratory testing to date.
- The risk to patients with implanted pacemakers and defibrillators are probably quite small.
- The potential for significant injury exists for Taser™ barbs striking the eye, open mouth, neck, genitals, and large blood vessels in the groin.
- The Taser is most unlikely to cause any permanent physical problems in healthy individuals.
- Based on available medical literature to date, there is no solid basis for potential claimants to pursue successful litigation with the exception of post traumatic stress disorder.

³⁰ Bleetman, Anthony, et al, The Advanced Taser: A Medical Review, United Kingdom, April 27, 2003.

Recommendations of the report:

- More work is required to record the effects of the Taser™ in physiological variables and ECG tracings.

- P. **Use of Tasers by Selected Law Enforcement Agencies.** This was a two-fold study which focused on 1) policies and procedures related to the issues of “use of force”, training, operations, and safety for selected law enforcement agencies that have purchased and used Tasers; and, 2) federal, state and local laws that specifically address Tasers™.³¹ The seven selected agencies included: Austin, TX Police Department, Ohio Highway Patrol, Orange County, FL Sheriff’s Office, Phoenix, AZ. Police Department, Sacramento, CA Police Department, Sacramento, CA Sheriff’s Office and the San Jose, CA Police Department.

Findings/Recommendations of the report: The seven agencies have established use-of-force policies, training requirements, operational protocols, and safety procedures to help ensure the proper use of Tasers™. Taser™ training is required for officers who use the weapons.

Operational protocols require that Tasers™ be visually inspected daily, appropriately safeguarded, and in some cases, tested weekly or at the beginning of an officer’s shift. Safety procedures require that Tasers™ not be used on children, pregnant suspects, near bystanders or flammable liquids; and that individuals hit in specific body areas with the Taser™ barbs, such as the neck or face, be examined by a physician.

With regard to federal, state and local laws that address Tasers™, it was found that some jurisdictions have laws but the requirements differ.

- Q. **Comparison of Average Shock Value or LEA Stun Pistol to Applicable Safety Standard**³².

Findings of the report: The report concluded that “shocks from the LEA Stun Pistol™ are well below the ventricular fibrillation threshold established by the International Electrotechnical Commission (IEC) standard 479-2”. The IEC establishes safety thresholds for shocks from manufactured equipment. The author stated that considering standard engineering tolerances for manufacture of circuits like the LEA stun pistol’s shock generator and the possibility of a person’s pulse exceeding a pulse rate of 150 under stress to a theoretical maximum potential human heart rate estimated at 220 pulses per minute, he further recommended that LEA never manufacture a stun pistol shocking at an rms current exceeding 15% of the ...fibrillation threshold for such shocks established by the IEC 479-2.

- R. **Air Force Research Laboratory Study** was reported by CBS News in February 2005 to prove that repeated TASER shocks led to heart damage in pigs. The claim was based on findings (by Dr. James Jauchem) that the pigs experienced a rise in blood acid levels and the enzyme Troponin T, which is a marker used by physicians in diagnosing acute myocardial infarction and other acute coronary syndromes. CBS quoted a Georgetown University Hospital Cardiologist (Dr. Charles Rackley) with respect to the significance of the findings.

The pigs in the study were shocked 18 times, when the majority of field exposures by humans are far less and, none of the pigs died. This report generated immediate controversy and was forcefully

³¹ GAO, Use of Tasers by Selected Law Enforcement Agencies. [Online], May 2005 URL <<http://www.iacp.org/research/rcdcuttingedgetech.htm>, 10/11/2005

³² Felper, Jerry, Comparison of Average Shock Value or LEA Stun Pistol to Applicable Safety Standard [Online] 25 March 2005. URL <<http://www.leacorp.com/lesslethal.asp>.

denounced by Taser International by the production of a contrary opinion from Dr. Jeffery Ho , an Assistant Professor of Emergency Medicine at the University of Minnesota School of Medicine.³³

- S. **The Amnesty International Report** was released in the fall of 2004 entitled “*Excessive and Lethal force? Amnesty International’s Concerns About Deaths and Ill-treatment Involving Police Use of TASERS™*”. The report documents AI’s concerns about the TASER™ and the potential for misuse and focuses attention on what AI believes is one of the most critical issues: a precise delineation of when it is appropriate for police to deploy a CED.

Recommendations of the report:

The report calls for law enforcement agencies to suspend the use of the electro-shock devices pending an independent inquiry into their use and effects. Where agencies decline to suspend using the devices, AI recommends that the use of Tasers™ be strictly limited to situations where the only other force option is deadly force.³⁴

- T. **Madison Police Department TASER Report:** This report was produced at the conclusion of a pilot program that saw TASERS™ introduced into the inventory of the Madison, WI Police Department (MPD) in the summer of 2003.³⁵

Findings of the report: The key findings were: 1) MPD’s deployment of the TASER™ reduced injuries to officers and suspects resulting from use-of-force encounters; 2) MPD’s deployment of the TASER™ reduced MPD’s utilization of deadly force; 3) The TASER™ proved to be a safe and effective use-of –force tool; and, 4) MPD officers are deploying the TASER™ in an appropriate manner.

- U. **Lethality of TASERS** was presented at the Annual Meeting of the American Academy of Forensic Sciences on February 25, 2005 by James Ruggieri.³⁶

Findings of the report: Mr Ruggieri reported that a review of available documents had led him to conclude that there were critical technical errors made by Taser International in their assessment of electrical risk. Among other things, he opined that the devices were indeed capable of killing people and that the electrical charge from the M26 fell into the zone that the International Electrical Commission (IEC) standards described as causing ventricular fibrillation (VF) 50% of the time.

J. Reilly, the author of the book entitled Applied Bioelectricity was frequently referred to during the presentation and was contacted for his views on Ruggieri’s assertions. Reilly was a participant in the HECO Study, which had concluded that the risk of VF in a healthy population was very low. In his formal response to the inquiry, Reilly concluded...and, was “not aware of scientific investigations of Taser™ safety in potentially sensitive people (e.g., the ill or under the influence of drugs).”

³³ *Taser Technology Review - Final Report*, [Online] British Columbia Office of the Police Complaint Commissioner, OPCC File NO. 2474, June 14, 2005. URL <<http://www.iacp.org/research/rcdcuttingedgetech.htm>, 10/11/2005

³⁴ *Taser Technology Review - Final Report*, [Online] British Columbia Office of the Police Complaint Commissioner, OPCC File NO. 2474, June 14, 2005. URL <<http://www.iacp.org/research/rcdcuttingedgetech.htm>, 10/11/2005

³⁵ *Taser Technology Review - Final Report*, [Online] British Columbia Office of the Police Complaint Commissioner, OPCC File NO. 2474, June 14, 2005. URL <<http://www.iacp.org/research/rcdcuttingedgetech.htm>, 10/11/2005

³⁶ *Taser Technology Review - Final Report*, [Online] British Columbia Office of the Police Complaint Commissioner, OPCC File NO. 2474, June 14, 2005. URL <<http://www.iacp.org/research/rcdcuttingedgetech.htm>, 10/11/2005

Taser International also responded to Ruggieri's statements by asserting that he had wrongly applied the IEC standards...

Studies Currently Underway (and soon to be released):³⁷

- V. **National Institute of Justice** is funding two programs that are relevant to CEDs. The first study is utilizing twelve different cities as study sites where emergency room physicians will assess and report on injuries related to lower lethality weapons deployment. This is the first epidemiology study of its kind. Wake Forest University Baptist Medical Center is receiving \$140,000 from NIJ under the direction of Dr. William Bozeman.
- W. The second study being funded by the **National Institute of Justice** is being conducted at the University of Wisconsin and is focusing on mapping the path of TASER™ current in the body. The results of the research are expected in mid-2007.

Recommendations by Professional Organizations

The International Association of Chiefs of Police (IACP)

The International Association of Chiefs of Police (IACP) refers to Electro-Muscular Disruption Technology (EMDT). EMDT is defined as a group of devices that use a high-voltage, low power charge of electricity to induce involuntary muscle contractions that cause temporary incapacitation. Recognizing that the increased use of these weapons has raised concerns about their safety, as well as concerns about liability and risks associated with deployment of the products, the IACP developed an Executive Brief to inform law enforcement leadership about the challenges surrounding this technology.³⁸ The Executive Brief is a step by step guide to aid law enforcement agencies in selecting, acquiring and using EMDT. The Executive Brief is intended to help law enforcement leadership develop policies, procedures, and training curricula that are responsive and relevant to the needs of the communities they serve by taking nine steps toward EMDT deployment:

1. Build the Leadership Team
2. Place EMDT on the Use-of-Force Continuum
3. Assess the Costs and Benefits of using EMDT
4. Identify Roles and Responsibilities for EMDT Deployment
5. Engage in Community Outreach
6. Develop Policies and Procedures for EMDT
7. Create a Comprehensive Training Program for EMDT Deployment
8. Use A Phased Deployment Approach for EMDT
9. Assess EMDT Use and Determine Next Steps

³⁷ *Taser Technology Review - Final Report*, [Online] *British Columbia Office of the Police Complaint Commissioner, OPCC File NO. 2474, June 14, 2005. URL <<http://www.iacp.org/research/rcdcuttingedgetech.htm>, 10/11/2005*

³⁸ **IACP, Electro-Muscular Disruption Technology 'A Nine-Step Strategy for Effective Deployment'**, [Online] *URL <<http://www.iacp.org/research/rcdcuttingedgetech.htm>, 10/11/2005*

The Police Executive Research Forum (PERF)

The Police Executive Research Forum (PERF) recently developed and published 50 training guidelines regarding the use of CEDs.³⁹ The guidelines are based on information gathered from police chiefs and other subject matter experts, two national surveys involving more than 130 law enforcement agencies, reports on CED research findings and agency policies collected for the purpose of preparing the recommendations. The first ten guidelines are:

1. CEDs should only be used against persons who are actively resisting or exhibiting active aggression, or to prevent individuals from harming themselves or others. CEDs should not be used against a passive suspect.
2. No more than one officer should activate a CED against a person at a time.
3. When activating a CED, law enforcement officers should use it for one standard cycle and stop to evaluate the situation (a standard cycle is five seconds). If subsequent cycles are necessary, agency policy should restrict the number and duration of these cycles to the minimum activations necessary to place the subject in custody.
4. Training protocols should emphasize that multiple activations and continuous cycling of a CED appear to increase the risk of death or serious injury and should be avoided where practical.
5. Training should include recognizing the limitations of CED activation and being prepared to transition to other force options as needed.
6. That a subject is fleeing should not be the sole justification for police use of a CED. Severity of offense and other circumstances should be considered before officers use a CED on a subject.
7. CEDs should not generally be used against pregnant women, elderly persons, young children, and visibly frail persons unless exigent circumstances exist.
8. CEDs should not be used on handcuffed persons unless they are actively revisiting or exhibiting active aggression, and/or to prevent individuals from harming themselves or others.
9. CEDs should not generally be used when a subject is in a location where a fall may cause substantial injury or death.
10. When a subject is armed with a CED and attacks or threatens a police officer, the officer may defend him- or herself to avoid becoming incapacitated and risking the possibility that the subject could gain control of the officer's firearm. When possible, officers should attempt to move outside the device's range (approximately 21 feet) and seek cover, as well as request back-up officers to mitigate the danger.

According to PERF, all 50 of the guidelines represent the best thinking of all contributors and are worthy of consideration. The remaining guidelines can be viewed at PERF's website.

New Technology

- To help examine how Tasers™ are used, and to add another layer of accountability in case of abuse of the weapon, Taser International, Inc. has developed a **Taser™ Cam**.⁴⁰ It is a detachable audio-video

³⁹ *PERF Conducted Energy Device Policy and Training Guidelines for Consideration* [Online] URL <http://www.policeforum.org/upload/PERF-CED-Guidelines-Updated-10-25-05%5B1%5D_715866088_1230200514040.pdf

⁴⁰ *Seattle Post-Intelligencer*, "Taser to offer stun gun cameras". [Online] 6 November 2005. URL <http://seattlepi.nwsourc.com/business/1310AP_Taser_Cam.html.

recorder that records in black and white and is equipped with infrared technology to record in very low light. A representative of Taser International advises that the Taser™ Cam is still being beta tested but will be available soon.

The **STINGER™** by Stinger Systems, Inc. can also be equipped with an audio-video recorder.

- Taser International plans to introduce the **Extended Range Electro-Muscular Projectile (XREP)** which can be fired out of a shotgun.⁴¹ Formal product launch is expected to occur in 2007.
- Taser International has introduced the Taser X26c specifically designed for the personal safety of civilians.⁴²

CONCLUSION

A review of all the materials summarized in this document indicates that it is not unreasonable to conclude that of all less than lethal alternatives, ECD devices are not likely to cause serious injury or loss of life for suspects or law enforcement officers, except in situations where certain medical conditions and drug use are factors. However, more research should be done on the overall safety of such devices. Agencies are well advised to consider best practices when developing policy and should recognize that “clearly established law” changes with each newly-issued court holding or with each new statutory revision.

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⁴¹ [Online] *A Taser Shotgun for long-range electrifying*. February 14, 2006.
URL <http://news.com.com/A+Taser+shotgun+for+long-range+electrifying/2100-1008_3-6039508.html>

⁴² [Online] *Taser International Presents Taser X26c Citizen Defense System*. April 13, 2006.
URL <<http://www.primezone.com/newsroom/news.html?d=97380>>