

**CAN THE FABRIC YOU WEAR HELP SAVE YOUR LIFE?**

**A New Standard of Safety for the Police Uniform**

**by**

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**July 2012**

**COMMAND COLLEGE CLASS 51**

The Command College Futures Study Project is a FUTURES study of a particular emerging issue of relevance to law enforcement. Its purpose is NOT to predict the future; rather, to project a variety of possible scenarios useful for strategic planning in anticipation of the emerging landscape facing policing organizations.

This journal article was created using the futures forecasting process of Command College and its outcomes. Defining the future differs from analyzing the past, because it has not yet happened. In this article, methodologies have been used to discern useful alternatives to enhance the success of planners and leaders in their response to a range of possible future environments.

Managing the future means influencing it—creating, constraining and adapting to emerging trends and events in a way that optimizes the opportunities and minimizes the threats of relevance to the profession.

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## **CAN THE FABRIC YOU WEAR HELP SAVE YOUR LIFE? A New Standard of Safety for the Police Uniform**

Fifty-Seven Thousand! That number may not sound like a lot when you are talking about million dollar budgets, or purchasing a major equipment upgrade for your department, but then again we are not talking about money here. 57,000 is the average number of law enforcement officers assaulted each year in the United States, according to FBI statistics dating back to 2005. As a Commander of a small department, I am always looking for creative ways to provide the best equipment to our personnel. Sure, we have special cameras, MDCs, Tasers and other technology, but what should we really be improving? How about our uniforms?

How can we take a standard uniform, be it blue, black, green or tan, and improve those articles of clothing worn by law enforcement personnel while on duty? Currently the uniforms worn in law enforcement agencies around the country work well and look professional, otherwise we probably wouldn't be wearing them. What if we could get professional looking uniforms; however, that have improved safety and versatility for the men and women wearing them? Would you be interested in making those uniforms available to your personnel?

There are three important issues facing law enforcement leaders when considering such a large change. First, is such a change necessary? When reviewing statistical data from the Federal Bureau of Investigation's Uniform Crime Report on Law Enforcement Officers Killed and Assaulted, 2010, specifically the Officers Assaulted category, we see there were thousands of police officers assaulted in 2010; with over 2,500 either stabbed or shot (FBI UCR 2010 Officers Assaulted, 2011, Lines 59 & 60). Second, where can we get such technology? The best place to look is the United States Military. The Military has experience with learning how to protect soldiers on the battlefield, and they have technologies that can aid law enforcement in the

development of new uniforms. Third, and probably the biggest issue for every agency, is funding. How do we pay for this technology? How much will these uniforms cost and what will be the recurring costs for cleaning and replacements?

### **A Possible Future**

Imagine, if you will, this possible future... As law enforcement agencies better prepare for terrorist attacks in the United States, each officer is issued ballistic uniforms. Issued as a standard uniform, each police officer now wears a fully ballistic set of trousers and uniform shirt. The ballistic stopping power of the uniform is consistent with the National Institute of Justice standards for a Level IIA vest. Since the ballistic material is added to the uniform's fabric, it is much more versatile and more comfortable than expected. Then one day it happens.

A terrorist organization sets off an explosive device in your city that sends shrapnel through a crowd of citizens. As police officers from around the region respond to the disaster, a second device is detonated some 10 minutes later. The second device is meant to hurt first responders who are arriving to help those wounded by the first device. Some emergency responders are injured, but none are killed. The new ballistic uniforms have proven their value and saved the lives of multiple officers who would have otherwise been killed by the secondary explosion.

Unrealistic? Far-fetched? Not quite. Remember Eric Rudolph, best known as the Olympic Park Bomber, for the 1996 Summer Olympics in Atlanta, Georgia. Rudolph was responsible for bombings at abortion clinics, a gay bar and the Olympic Park between 1996 and 1998. He was responsible for killing two people, one of them being Birmingham Police Officer Robert Sanderson, and injuring over 100 others, including several first responders in Sandy Springs, Georgia (Staff, 2005, par. 2, 4-6, 8 ). The bombing in Sandy Springs was a double

explosion, with the secondary blast occurring some 45 minutes later, injuring law enforcement officers and rescue workers nearby. Eric Rudolph was one person, not nearly as sophisticated as the terrorist and extremist groups that law enforcement will see in the future. Rudolph showed us that law enforcement officers need better ballistic capabilities built into their uniforms to further help them survive the assaults that will undoubtedly continue to plague our society.

### **Statistically Speaking**

When reviewing the need for improved uniform protection for law enforcement officers, the best place to start is with the Federal Bureau of Investigation's 2010 Law Enforcement Officers Killed and Assaulted (LEOKA) reports (which can be found at <http://www.fbi.gov/about-us/cjis/ucr/leoka/leoka-2010/about-leoka>). These extensive reports provide information about officers who were killed, feloniously or accidentally, and those officers who were assaulted while performing their duties. The data is collected through the Uniform Crime Reporting Program. Each year a report is compiled that outlines the location, criteria, summaries, and methodology of each assault or death.

According to the FBI's 2010 statistics, there are more than 530,000 peace officers in the United States. The rate of officers assaulted was 10 for every 100 officers. A majority of assaults on law enforcement officers occurred with a personal weapon such as hands, fists or feet. More than 1,800 officers, though, were assaulted with a firearm; almost 900 officers were assaulted with a knife or other cutting instruments. In 2010, the highest numbers of officers assaulted occurred while they were responding to disturbance calls. (FBI UCR 2010 Officers Assaulted, 2011, Line 31) The highest number of officers killed occurred by ambush while the second highest occurred when officers were attempting an arrest (FBI UCR 2010 Officers Killed, 2011, Lines 25 & 26). The ambush statistic is alarming because it has more than doubled since 2008. In

both 2009 and 2010, the ambush was the leading cause of officers being feloniously killed in the United States.

Thirty-four percent of law enforcement officers that were feloniously shot and killed in 2010 were shot in the torso, back or below their ballistic vest. Perhaps, with stronger and more versatile ballistic materials utilized in law enforcement uniforms, that number could have been reduced and those officers might have sustained minor to moderate injuries rather than fatal wounds. It is important that law enforcement organizations, both governmental and fraternal, explore the safety of our uniforms with companies that provide our soldiers on the battlefield with the latest state of the art ballistic protections. The safer we can make the law enforcement uniform, the better chance of survival our protectors will have.

### **The Military Experience**

Over the last two decades, the United States Military has been involved in several different armed conflicts around the world. These wars, although unfortunate in their mere existence, have afforded opportunities to develop technology that can improve the lives of people around the world. Research facilities such as the Natick Soldier Research, Development and Engineering Center located in Natick, Massachusetts employ scientists, engineers, textile technologists, clothing designers, and retired military specialists to design, develop and test everything a soldier can wear in the field (Reinert, 2011, par. 1-2). Their research and development has led to improved technologies being utilized on the battlefield.

An example of this technology is the “ballistic underwear” the US Marine Corps issues to each Marine deployed to the war in Afghanistan. According to Marine Corps Systems Command officials, “what the garment does is more wound mitigation.” The tier 1 ballistic underwear is manufactured from scientifically-tested ballistic silk material that provides an initial level of

protection against the effects of IED blasts (Mancha, 2011, par. 4). According to BBC News, “The underpants are coated in an anti-microbial agent which protect against infections, and they come in a range of sizes, while the tier 2 protection is a unisex one-size-fits-all.” (Mancha, 2011 par.5). The ballistic underwear helps protect the femoral artery located around the inner thighs (Mancha, 2011, par. 10). This concept is not limited to undergarments, but is expanding to comprise the entire uniform.

In May 2011, Amendment II, an American Combat Apparel Company, released a new version of a combat uniform. The Combat Ready Uniform<sup>TM</sup> known as the CRU Guardian<sup>TM</sup> is a blend of the best ballistic-resistant fibers available, all of which surpass the National Institute of Justice’s (NIJ) Level II Body Armor Classification (Administrator, 2011, par. 3). In a recent demonstration, the newly developed uniform easily stopped a 9 mm, .40 S&W and .45 S&W bullet impact from 15 feet (Administrator, 2011, par. 3). Amendment II's CRU will enable soldiers to have more protection against shrapnel from IEDs that are injuring and killing them (Administrator, 2011, par. 8).

Another ballistic protection product that Amendment II is offering is called RynoHide<sup>TM</sup>. RynoHide<sup>TM</sup> is a Carbon Nanotube compound that was developed in cooperation with the University of Utah’s Nano Institute, to help improve the ballistic capabilities of protection equipment while making it lightweight and flexible. RynoHide<sup>TM</sup> works in conjunction with traditional soft body armor to help minimize the amount of back-face deformation on a ballistic vest. “Back-face deformation is the bulge that occurs in the back of the armor from a projectile hitting the front without passing completely through.” (PRWEB, 2012, par.5)

The acceptable back-face deformation limit for body armor, as set by the National Institute of Justice, is 44mm, or nearly two inches. RynoHide helps body armor achieve a back-

face deformation level in the low 30's, without increasing the weight of the armor. Less back-face deformation means less hurt on the body (PRWEB, 2012, par. 6). According to R.G. Craig, President of Amendment II, "That's a huge advantage for the user of the armor if they get hit. It could be the difference between a stay in the hospital or simply going home at the end of the day to your family." (PRWEB, 2012, Par. 7)

Recently, researchers at the United States Army Research Laboratory and the University of Delaware have been experimenting with a new form of "liquid body armor" called a shear-thickening fluid (STF) (Wilson, 2011, par. 5, 8). The shear-thickening fluid is made of silica particles suspended in polyethylene glycol. The fluid is diluted in ethanol and then used to saturate Kevlar panels. The saturated panels are then placed in an oven to evaporate the ethanol. The shear-thickening fluid permeates the Kevlar and Kevlar strands hold the particle-filled fluid in place. When an object strikes or stabs the Kevlar, the fluid immediately hardens, making the Kevlar stronger. After the strike, the fluid returns to a flexible state again.

In laboratory tests, STF-treated Kevlar is as flexible as plain, or neat, Kevlar. The difference is that it's stronger, so armor using STF requires fewer layers of material. Four layers of STF-treated Kevlar can dissipate the same amount of energy as 14 layers of neat Kevlar. In addition, STF-treated fibers don't stretch as far on impact as ordinary fibers, meaning that bullets don't penetrate as deeply into the armor or a person's tissue underneath. The researchers theorize that this is because it takes more energy for the bullet to stretch the STF-treated fibers (Wilson, 2011, par. 7). One can easily imagine a uniform quite similar to that worn by today's police officers, only with STF-treated fibers, becoming the first generation of full-body armor for an officer in the field.

Private corporations, such as Amendment II, have realized there is a market in the military, law enforcement and executive protection area to provide better ballistic capable materials. The lighter and more protectant the material the bigger the profits can be. Scott Van Der Veer, President of BulletProofShop.com, who sells ballistic armor such as those developed by Amendment II, said in an conversation that these new materials "...will change the entire industry. To have this type of protection and the flexibility to go with it is a major step towards hidden protection without hindering the person from movement."

### **The Money Game**

When discussing the financial burden of trying to fund such a major change in uniforms you really have to think outside the box. In addition to existing funds budgeted for uniform replacement, the ideal way to fund such a project would be through a federal, state or local grant. This would limit the impact on agency budgets while accomplishing the goal of improving officer safety. One of the best known places for grant opportunities is with the United States Department of Justice. The DOJ has grant programs under several offices such as the Office of Justice Programs, the Bureau of Justice Assistance and the Community Oriented Policing Services Office. State grants can be found through your respective State's Department of Justice programs.

Another source of funding, depending on the legal standards for your jurisdiction, would be the use of asset forfeiture funds. Utilizing asset forfeiture funds to purchase protective equipment may be permissible depending on the statutes affecting your organization's use of such funds. Law enforcement agencies around the country have utilized asset forfeiture funds to purchase bullet resistant vests, surveillance equipment, firearms and specialty vehicles. Although asset forfeiture funds are helpful they may not always be available. Asset forfeiture funding

really depends on the level of seizures so those avenues of funding should not be relied upon for a consistent revenue source.

A third source of funding can come from private investments or donations. Agencies that have non-profit advisory councils that can raise funds for supplemental law enforcement needs would be able to help offset the costs of purchasing the new uniforms. An Advisory Council (commonly named a Police Council) are non-profit organizations that support the law enforcement agency by purchasing equipment or training for the men and women of the agency over and above what the department's operating budget allows. Such councils are commonly made of a citizen board of directors that follow an established set of by-laws in order to conduct fundraising events for the police department.

For instance, the San Luis Obispo County Sheriff's Office in San Luis Obispo, California has a Sheriff's Advisory Council. Their council was started in 1988 and has over 100 active members. Since 1988, the Advisory Council has provided equipment and training for the Sheriff's Posse, Search and Rescue Team, Dive Team and Volunteer Patrols. Sheriff's Advisory Council Chairman James Brabeck says, "We assist the Sheriff's Office with providing financial support for those programs and projects that don't qualify for conventional funding". In the past year the Sheriff's Advisory Council has provided nearly \$60,000 to purchase new equipment for the Coroner's Office, provide training for fire related death investigators from around the world and provided materials to county wide K9 enforcement teams. Mr. Brabeck says that even though the economy has been difficult in recent years, he has found that corporate donations and contributions from community members have not diminished.

## **Conclusion**

Law enforcement organizations need to look at the safety and versatility of their duty uniforms to determine how they can make the uniform more suitable to the performance measures of the patrol position. The most important factor is the safety of the uniform. If there are fabrics in use by the military that provide ballistic protection, then law enforcement agencies around the country should explore their uses in the patrol uniform

The uniform is sometimes taken for granted, not just by the officer, but also by the public as well. Typically, an officer wears their patrol uniform from eight to twelve hours each day. Some days it may be even longer depending on the circumstances. What most people may see as simple articles of clothing, psychologically, the criminal element sees the law enforcement uniform as a threat; a threat to their existence and their ability to steal, rob, assault and prey on society's most vulnerable. Rather than a mere item of clothing, the police see the uniform as the first level of their personal security

Certainly, violence against law enforcement officers will continue into the future. With the threat of terrorist attacks and extremist groups growing in the United States, it is imperative that law enforcement agencies adapt to the latest technology to protect their front line responders. These protections will come from advancements in uniform fabrics, ballistic protections, technological attachments and weaponry. The law enforcement officer of the future will need extra protection built into the very symbol of security they wear...the uniform.

## REFERENCES

- (2011, October). Law Enforcement Officers Killed and Assaulted 2010. *Department of Justice, Federal Bureau of Investigation*. Retrieved July 7, 2012, from <http://www.fbi.gov/about-us/cjis/ucr/leoka/leoka-2010/officers-assaulted/officers-assaulted>
- (2011, October). Law Enforcement Officers Killed and Assaulted 2010. *Department of Justice, Federal Bureau of Investigation*. Retrieved July 7, 2012, from <http://www.fbi.gov/about-us/cjis/ucr/leoka/leoka-2010/officers-feloniously-killed/felonious-2010.pdf>
- (2011, October). Law Enforcement Officers Killed and Assaulted 2010. *Department of Justice, Federal Bureau of Investigation*. Retrieved July 7, 2012, from <http://www.fbi.gov/about-us/cjis/ucr/leoka/leoka-2010/officers-assaulted/assaults-2010.pdf>
- Administrator (2011, May 13). Bulletproof Combat Ready Uniform (CRU). *Uniform Market News*. Retrieved August 22, 2011, from <http://www.uniformmarketnews.com/component/content/article/34-militarynews/1224-amendment-ii-announces-the-availability-of-worlds-first-bulletproof-combat-ready-uniform-cru.html>
- Staff (2005, April 19). Rudolph Reveals Motives. *CNN Justice*. Retrieved July 7, 2012, from [http://articles.cnn.com/2005-04-13/justice/eric.rudolph\\_1\\_emily-lyons-pipe-bomb-attack-eric-robert-rudolph?\\_s=PM:LAW](http://articles.cnn.com/2005-04-13/justice/eric.rudolph_1_emily-lyons-pipe-bomb-attack-eric-robert-rudolph?_s=PM:LAW)
- Staff (2012, April 24). Amendment II Release RynoHide - The World's First Carbon Nanotube Armor for Bulletproof Vests and Other Military, Law Enforcement, and Personal Protective Tactical Gear. *PRWEB*. Retrieved July 14, 2012, from <http://www.prweb.com/releases/2012/4/prweb9433273.htm>
- Gibson, T. (2012, January 12). ARL: Shear Thickening Fluid. *DVIDS - Defense Video Imagery Distribution System*. Retrieved July 6, 2012, from <http://www.dvidshub.net/video/134802/arl-shear-thickening-fluid>
- Mancha, M. (2011, June 22). Ballistic Underwear Make Their Way to Marines in Afghanistan. *DVIDS - Defense Video Imagery Distribution System*. Retrieved August 22, 2011, from <http://www.dvidshub.net/news/72521/ballistic-underwear-make-their-way-marines-afghanistan>
- Reinert, B. (2011, October 13). Experts Improve Function, Durability, Comfort of Soldier Apparel. *Fort Hood Sentinel*. Retrieved July 7, 2012, from <http://www.forthoodsentinel.com/story.php?id=7688>
- Wilson, T. (2007, February 26). How Liquid Body Armor Works. *HowStuffWorks.com*. Retrieved July 7, 2012, from <http://science.howstuffworks.com/liquid-body-armor.htm>