

New Technologies Protect Officers and Inmates

By Cason Lane

Imagine being able to subdue an inmate by lighting up a cell with bright green lasers from a handheld flashlight. Picture yourself temporarily disabling an inmate with an electric shock from 30 feet away, or firing a projectile that combines the sting power of blunt impact and a cloud of pepper powder.

These capabilities may be closer than you think. They are "less-than-lethal" technologies currently being developed by the National Institute of Justice (NIJ). A division of the U.S. Department of Justice, NIJ's Office of Science and Technology funds research and development in science and technology specifically for both state and local law enforcement and corrections.

Less-than-lethal weapons are designed to minimize the risk of death and injury to correctional and law enforcement officers, inmates, suspects and the public. From blunt-impact projectiles to baton-launched nets, less-than-lethal technologies enable correctional officers to temporarily disable inmates while increasing stand-off distance and buying a few precious seconds to gain control of a situation. Less-than-lethal technologies also help correctional officers deal with low-level threats before they get out of control, and may reduce the threat of lawsuits.

"When you consider the alternative might be a 9 mm, less-than-lethal is definitely the way to go," says Jim Mahan, senior technologist for the Federal Bureau of Prisons (BOP). Less-than-lethal technologies are typically in development for 2 to 5 years. The following is a preview of some of the projects currently in the works.

Laser Dazzler

The laser dazzler looks like a heavy-duty flashlight. Powered by standard AA rechargeable batteries, it functions like one, too. The difference is that it shines a green laser, flashing at rapid random intervals to disorient and distract an inmate. It can work in daylight or darkness, with a beam that can cover hundreds of yards.

A handheld device, the laser dazzler is designed to subdue offenders by creating an impenetrable "optical wall" of flashbulb effects, separating the officer from the inmate while hampering the inmate's use of a weapon, and giving the officer more time to react.

The laser dazzler increases stand-off distance by distracting a subject at long range. The farther the officer is from the target, the bigger the beam of pulsating light. However, unlike a regular flashlight, the laser dazzler can be adjusted to remain focused on the target at short and long ranges. The tool does not cause bodily harm and is intended to be eye-safe at all distances.

It could be used to light up a prison cell from just a few yards away, to help extract an inmate. Or, the laser dazzler could help deter groups of people in a riot situation, or illu-

minate targets — To identify a single offender, for example, in a throng of people.

"The beauty of lasers is that they work at long ranges," says Richard Nelson, senior engineer for LE Systems in Glastonbury, Conn., which is developing the prototype for NIJ. "Even the best flashlights start to lose their effect after 40 or 50 feet. With the laser, we can go out to half a kilometer." The laser dazzler seeks to improve existing red-laser technology, which also distracts subjects with glaring and flashing light, but at shorter ranges. Compared with red light, green light is about 25 times as bright during the day and thousands of times brighter at night.

Developers are considering a device that would combine both red and green lasers to further enhance the disorienting effect. Also on the drawing board is a "perimeter defense" laser unit, which is a spotlight-like laser device mounted at an elevated position that could flood a large area, such as a recreation yard, with pulsating light.

LE Systems hopes to release the laser dazzler, at just less than \$1,000 per unit, by the end of the year. The device is being tested for eye safety by the U.S. Air Force Research Laboratory.

Sticky Shocker®

The Sticky Shocker® is a wireless projectile, named for its ability to both adhere to a human target and deliver an electrical, temporarily disabling shock. The projectile is a 4-inch-long cylinder fired from a handheld launcher. Armed with glue or with short barbs that attach to clothing, the projectile shocks the target with 10 to 15 high-voltage pulses per second, for 6 to 8 seconds. Power is supplied by batteries and electronics contained in the projectile.

Extending the range of traditional electrical stun guns from arm's length to about 10 meters, the Sticky Shocker® allows an officer to temporarily disable a subject at a safe stand-off distance. The projectile travels 10 meters in about one-third of a second. "The Sticky Shocker® is one of the few less-than-lethal projectiles that works at short stand-off distances without putting the officer at risk," says Lt. Sid Heal, of the Technological Exploration Unit at the Los Angeles Sheriff's Department, a pilot site for many less-than-lethal technologies. The short-range effectiveness should make it useful in removing inmates from their cells.

"The advantages are that you can engage at closer ranges; it isolates a single individual; and it's environmentally benign. You don't have to contaminate a whole area to use it," Heal says. Additionally, Mahan indicates that after repeated use, inmates may try to block the shock by insulating themselves with materials such as newspapers and towels. "Inmates have already learned to dodge the effect of pepper spray by holding up a mattress," Mahan says, adding "they are very adaptive. As technologists, we have to be cognizant of that."

The Sticky Shocker® immobilizes a subject for several minutes. Future prototypes may include a remote-control feature that lets the officer deliver a second series of shocks if necessary. Jaycor, a private high-tech company in San Diego, developed the current prototype, which has been demonstrated on dummies. A health risk assessment was conducted during the development of the product. NJ is working with researchers at Pennsylvania State University to assess the health effects of the Sticky Shocker® based on information provided by the developer.

Ring Airfoil Projectile

The Ring Airfoil Projectile (RAP) is a doughnut-shaped rubber projectile that combines accuracy and speed to "sting" a subject up to 40 meters away. Flying straight with a flat trajectory, the 2.5-inch ring travels at 185 feet per second, hitting the target with about 39 foot pounds of energy. Through an NJ grant, the developer is working on a way to incorporate oleoresin capsicum (OC), or pepper spray, into the RAP to help ensure temporary incapacitation.

"We have an understanding of how OC spray is absorbed into the body," says Sandy Newett, program manager at NJ. "But when you make it into a powder, it can be absorbed differently. We have to research that."

RAP was developed more than 20 years ago for the military but was never used. Since it was designed to be launched from the not readily available M-16A1, NJ funded the development of a prototype handheld device. The completed weapon may have a collapsible stock and optional laser for aiming. NJ has provided a grant to Guilford Engineering Inc., in Guilford, Conn., to develop the prototype.

Most weapons that fire projectiles have danger zones, ranges in which serious injury or death could occur. RAP, however, is nonlethal at close range. It also is effective up to 40 meters, which would allow its use in larger spaces.

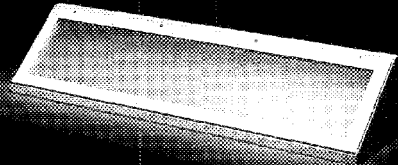
Contraband Detection

NJ also is working with BOP in the area of contraband detection. Although this has always been a priority for prison and jail administrators, work in the detection of weapons and contraband was accelerated at BOP when, in 1997, a staffer in the mail room at the Leavenworth, Kan., federal penitentiary spotted a suspicious envelope. The local bomb squad was immediately contacted; X-rays of the envelope revealed an explosive device. Similar devices were intercepted at the Leavenworth post office and the Washington, D.C., office of *El Hayat*, a Saudi Arabian newspaper.

BOP's Office of Security Technology (OST) responded to the incident by investigating mail-screening technologies that could complement its existing mail X-ray procedures. During its research, OST discovered SCANMAIL 10K, a device manufactured in England. SCANMAIL finds metal objects in letters, magazines, padded mailers, newspapers, books and catalogs. The scanner provides visual and audio alarms when metal is detected, while ignoring normal items such as staples and paper clips.

BOP tested the device at the Metropolitan Corrections Center in New York. Nine test pieces were concealed among inmate and staff mail, including: a blank .22-caliber bullet;

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a utility knife; a razor blade; a 3-inch piece of a hacksaw blade; a handcuff key; a penny; a small 1.5 volt battery; a blank 9 mm bullet; a small, gold, foil-lined computer chip; and an electronic greeting card with wires and a battery.

SCANMAIL didn't miss anything. The test pieces were detected with 100 percent accuracy, as was a padded mailer with five magazines with the test pieces in the middle magazine, and a padded mailer with three paperback books inside. BOP officials conducted additional tests, concealing metallic objects in clothes, shampoo bottles, baby powder and soap bars.

BOP also identified a technology that would provide immediate, reliable, nonintrusive and noncontact screening of inmates for small weapons and/or metallic contraband concealed in body cavities. The Body Orifice Security Scanner (BOSS) is a metal detector chair that incorporates nonmotion static detection and has two independent sensors: one mounted in the seat for rectal and vaginal region detection and a second countertop sensor mounted on the side of the chair for oral region detection. When the inmate sits in the chair or places his/her chin on the oral scanner, audio and visual alarms alert the staff if there is a hidden metallic object in the scanned orifice. The detectors are sensitive enough to detect a handcuff key 6-inches from the sensor surface.

BOP put BOSS chairs in four of its facilities for 90-day evaluations. During that time, the devices detected two contraband items that were not discovered by handheld metal detectors: a razor blade and a gold chain with a medallion. Both items had been wrapped in tape, placed in the cut-off finger of a rubber glove, and concealed in the inmate's rectum. Also, shrapnel and dental work that went undetected by metal detectors and were not visible through normal visual search procedures were detected by BOSS and later verified through medical and dental X-ray records. According to Karen Hogsten, acting chief of OST, BOP staff indicated much more confidence in conducting visual searches after using the BOSS chair. Both SCANMAIL and BOSS have been installed in numerous federal facilities. "These are just two examples of products or their equivalents that meet or exceed BOP specifications," Hogsten added. "Other products may be available that meet or exceed these specifications."

Conclusion

The development and implementation of new technologies is not meant to be a silver bullet for corrections. Instead, technologies such as these act as a complement to the existing resources of the nation's prisons and jails, allowing corrections officials to provide a safe environment for both inmates and staff.

Cason Lane is a freelance writer for Wings Publishing in Spring, Texas, a company contracted by NJ. For more information on any of these technologies, call Sandy Newett, NJ, at (202) 616-1471, or BOP's Office of Security Technology at (202) 307-3191.

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approved by the superintendent, who has the authority to approve, deny, suspend or terminate visits.

The policy further prevents "maximum, close custody and death row offenders" from participating in the program and restricts any offenders who have a documented history of domestic violence against anyone. Additionally, the directive provides that only those spouses who were legally married to offenders prior to incarceration for their current crime(s) are eligible for EFV.

The court reasoned that, with respect to inmates married after incarceration, such as Daniel, there is no existing family relationship for the prison to attempt to preserve.

On Feb. 25, 1995, the new EFV directive, as well as a policy statement governing its implementation, was issued. One of the implementation guidelines allows the superintendent discretion to approve EFV for any inmates who had: 1) either already been participating in the program or had applied to the program prior to Jan. 10, 1995; and 2) were determined not to present safety or security concerns for the program or the participants.

In Daniel's case, the superintendent stated that Daniel was not eligible for the "grand fathering" exception because his marriage took place while he was incarcerated and because he had not previously participated in the EFV program.

When Daniel sued, claiming a 14th Amendment Equal Protection violation, the court held in favor of the prison officials. The court reasoned that, with respect to inmates married after incarceration, such as Daniel, there is no existing family relationship for the prison to attempt to preserve. Given the safety risks inherent in the EFV program and the deference afforded prison officials in their decisions concerning safety risks, the superintendent's decision was a rational one. The court also took notice of the superintendent's judgment that most of the marriages that occur after incarceration follow a "pen-pal" courtship. Thus, the spouse is not familiar with the inmate's behavior and may not be aware of the inmate's full criminal history.

Therefore, the superintendent concluded that the potential for violence against an unknowing spouse was a safety risk the prison was not willing to assume.

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