Military readies directed-energy weapons

(AP) -- A few months from now, Peter Anthony Schlesinger hopes to zap a laser beam at a couple of chickens or other animals in a cage a few dozen yards away.

If all goes as planned, the chickens will be frozen in mid-cluck, their leg and wing muscles paralyzed by an electrical charge created by the beam, even as their heart and lungs function normally.

Among those most interested in the outcome will be officials at the Pentagon, who helped fund Schlesinger's work and are looking at this type of device to do a lot more than just zap a chicken.

Devices like these, known as directed-energy weapons, could be used to fight wars in coming years.

"When you can do things at the speed of light, all sorts of new capabilities are there," said Delores Etter, a former undersecretary of defense for science and technology and an advocate of directed-energy weapons.

Directed energy could bring numerous advantages to the battlefield in places like Iraq and Afghanistan, where U.S. troops have had to deal with hostile but unarmed crowds as well as dangerous insurgents.

Aside from paralyzing potential attackers or noncombatants like a long-range stun gun, directed-energy weapons could fry the electronics of missiles and roadside bombs, developers say, or even disable a vehicle in a high-speed chase.

The most ambitious program is the Air Force's Airborne Laser, a plan to mount a laser on a modified Boeing 747 and use it to shoot down missiles.

At the same Air Force Research Laboratory in New Mexico, researchers working with Raytheon Co. have developed a weapon called the Active Denial System, which repels adversaries by heating the water molecules in their skin with microwave energy. The pain is so great that people flee immediately.

"It just feels like your skin is on fire," said Rich Garcia, a spokesman for the laboratory who, as a test subject, has felt the Active Denial System's heat. "When you get out of the path of the beam, or shut off the beam, everything goes back to normal. There's no residual pain."

A Humvee-mounted Active Denial weapon is expected to be given to all services by the end of this year for evaluation, with a decision about deployment expected by the end of 2005.

But the idea of using directed energy against humans is creating debate fueled by deaths allegedly caused by Taser stun guns and the alleged abuse of Iraqi prisoners -- which put the military's respect for human rights under a microscope.

Some experts believe the use of directed energy will be limited by international law and treaties.

"Although it seems like it would be more desirable to disable rather than to kill them, the problem is there are all sorts of treaties in place that limit how you can disable noncombatants," said Loren Thompson of the Lexington Institute, a defense think tank. "It's kind of perverse, but sometimes the backlog of old laws can get in the way of being humane."

Military officials believe the intended uses of the Active Denial System do not violate any international laws or treaties and do not cause any permanent health problems.

"You can rest assured that with this system, when it finally is deployed, we will be very, very clear about what the intended uses are and what is clearly outside of bounds," said Marine Corps Capt. Daniel McSweeney, spokesman for the Joint Non-Lethal Weapons Directorate. "It's not intended to be used as a torture device. That goes against all the design intentions and parameters."

Research into side effects of weaponized directed energy began in the late 1990s at the Air Force's Brooks City-Base in San Antonio. Researchers began by reviewing studies of radio-frequency energy involved in military communications, radar and other technologies, officials say.

Human testing of the Active Denial System began after researchers concluded it could be used without permanent harm. More than 200 volunteers -- including some in their 70s -- from various military branches and government agencies were zapped with the system, on average about three times each.

The results showed no lingering health problems, officials say.

"This type of device doesn't penetrate very far," said Lt. Col. William Roach, chief of the radio frequency branch of the Air Force Research Laboratory.

But the fact that studies on directed energy's human effects haven't been released to the public has some outside the government worried.

Dominique Loye of the International Committee of the Red Cross has pleaded for more disclosure of directed-energy research and independent investigation into possible side effects.

Directed energy may cause "new types of injuries we're not aware of and may not be capable of taking care of," Loye said. "The message we try to put across is: 'We understand some companies are investing money, so maybe it will be worthwhile for you to start the investigation as early as possible and not to invest millions and millions and then 10 years down the line find out your weapon will be illegal.'"

The weapons' developers, on the other hand, pitch them for their lifesaving potential.

The pinpoint accuracy of a laser could eliminate collateral damage caused by missile explosions, the argument goes, and stun gun-like weapons could save lives in hostage or bomb-threat situations. Directed energy also has the potential to explode roadside bombs or mines from a distance.

"You're dealing with the ability to pre-detonate the majority of improvised explosives that are used right now," said Pete Bitar, president of Xtreme Alternative Defense Systems, an Anderson, Ind., company that is developing a rifle-sized directed-energy gun for the Marines.

The device works by creating an electrical charge through a stream of ionized gas, or plasma.

Bitar says it could be tuned to target the electronics of a vehicle or explosive device, or tuned to temporarily paralyze voluntary muscles, such as those that control arms and legs. The involuntary muscles, like heart and lungs, operate at a different frequency.

So far, this and a handful of similar weapons are only in the prototype stage. Production models, if approved by the military, would not be ready for a few years.

The device being developed by Schlesinger's company, HSV Technologies Inc. of San Diego, will operate similarly to Bitar's, except the electrical charge will be created by an ultraviolet laser beam, rather than plasma. He, too, says the device is designed for non-lethal purposes only.

"Later on, as certain agencies or law enforcement gets involved in this, and they see the need for lethality, I'm sure that can be developed later," Schlesinger said. "It could induce cardiac arrest, for example. But that is not our patent, and not our intent."

Still, that potential is sure to make opponents of directed energy skeptical.

"It's encouraging that the U.S. is searching for more humane weapons," said the Lexington Institute's Thompson. "But it's very hard to convince other countries that our goals are ethical."

Find this article at:
http://www.cnn.com/2004/TECH/science/08/02/directedenergyweapons.ap/index.html

☐ Check the box to include the list of links referenced in the article.