

ARDEC engineers develop Solid State Active Denial Technology for non-lethal crowd control

By Lauren Poindexter, Picatinny Arsenal Public Affairs October 12, 2016



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PICATINNY ARSENAL, N.J. -- Engineers at Picatinny Arsenal are developing technology for non-lethal crowd control designed to help protect Soldiers while minimizing collateral

damage and preventing any permanent physical harm.

Engineers believe that the Solid State Active Denial Technology or SS-ADT, is highly promising for crowd dispersal, checkpoint security, perimeter security, and port protection from both mobile and fixed site applications. Other potential applications include static defense, suppression of vehicle and vessel operators or occupants, along with critical asset protection.

"The work over the last few years resulted in a working prototype that is planned for use in Military Utility Assessments," said Thomas Shadis, chief of the Directed Energy and Non-Lethal Branch, which is part of the U.S. Armament Research, Development and Engineering Center or ARDEC.

"The team continues to work on further reducing the size, weight and power of the technology to enable integration on tactical vehicles," Shadis continued.

SS-ADT is a directed energy weapon that uses radio frequency or RF, millimeter waves at 95 GHz traveling at the speed of light to create a brief intolerable heating sensation on the person's skin at tactically useful ranges. The heat sensation propels persons to instinctively move to escape the energy.

A Soldier is "in the loop" while operating the system, which automatically times out in a few seconds to limit exposure and renders the technology safe. The beam of RF energy created by the technology is invisible, silent, and can penetrate glass and clothing.

There is minimal risk of injury due to the shallow energy penetration, resulting in only about 1/64th of an inch into the skin. The effects begin instantaneously, causing the skin to heat quickly, reaching an intolerable effect level and forcing a response such as a flinch or flee.

"It feels like an intense heating sensation similar to opening an oven door and a burst of heat instinctively makes you move away," said Edward Robinson, the ARDEC project officer.

The effects stop when the adversary moves away from the beam.

According to Robinson, the technology has undergone a full legal and treaty review and is compliant with the international legal obligations of the United States.

These obligations include the law of war treaties and arms control agreements to which the United States is a party. The technology is also consistent with customary international law, domestic law and U.S. policy.

These reviews have determined there are no legal prohibitions to the development and use of this technology when used properly and in accordance with appropriate tactics, techniques and procedures.

Solid state active denial technology is designed to give the warfighter a non-lethal weapon system to enhance both base protection and mounted vehicle applications.

The technology can be used without adverse environmental impacts and provides minimal risk of injury. With the ability to stop, deter and turn back an advancing adversary, the technology is an alternative to lethal force.

TECHNOLOGY BENEFITS:

- SS-ADT only requires a recharging of the battery and thermal management system.
- Reduces logistics/resupply burden: existing conventional non-lethal systems require a resupply of munitions once the basic load is consumed.
- Lightweight, small footprint that is suitable for vehicle mounting or hard stand.

This is a joint Army ARDEC S&T project.

The U.S. Army Armament Research, Development and Engineering Center is part of the U.S. Army Research, Development and Engineering Command, which has the mission to ensure decisive overmatch for unified land operations to empower the Army, the joint warfighter and our nation. RDECOM is a major subordinate command of the U.S. Army Materiel Command.