

# **Non-Lethal Weapons Concepts of Operations Using a New Type of Sensor Fence**

Dr. Nicholas C. Nicholas and Dr. David C. Swanson

*The Applied Research Laboratory of the Pennsylvania State University*

Perimeter defense is a major security problem. Many restricted facilities are surrounded by civilian areas where the use of lethal weapons to enforce perimeter security could risk injury or death to innocents. Current sensor systems are unreliable and very expensive to maintain because of their nature.

A new type of sensor fence has been patented by the Pennsylvania State University in the names of the authors of this paper. It is easy to install on any existing chain link fence, requires almost no maintenance, and can be linked to non-lethal weapons. The sensor fence detects and localizes attempts to climb, cut, or lift the fence on which the sensor system is installed. Nodes transmit the detection and localization data real time to security centers for action. For example, our prototype fence has been operating for more than two years with no maintenance and points a TV camera at points of attempted penetration.

This paper describes the new type of sensor fence and several concepts of operation that employ non-lethal weapons.