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Innovative UV-based bioterror protection device

Published 23 June 2006

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Another CCAT-supported promising solution: Novatron developed a UV-based protective system against bioterror agents; the military is already interested, and non-military markets may soon warm up to the solution

In 1996 the U.S. Army wanted to have a system developed which protects personnel in Army tanks against airborne biological threats such as microbes and viruses. The Army was interested in using intense ultra violet (UV) rays to prevent such biological agents from infiltrating the interior of the tank. A team led by Dr. Wayne Clark worked on the project and in 1998 proved that the technology was successful in killing microorganisms in blowing air. The one problem: The system required a lot of energy to perform the operation.

In 2000 Clark started his own company, Novatron, in San Diego, California, and later that year the company received its first contract to develop and test technology for a pulsing UV device to be used in a building's ventilation system to kill biological terror agents such as anthrax spores, ricin, or smallpox but also other organisms, such as a cold or flu viruses. The device the company built was called Advanced UV System (AUVS).

The concept behind the solution called for installing intense UV air sterilization equipment in the building's heating, ventilation and air conditioning (HVAC) system to kill microorganisms in flowing air. Novatron submitted a proposal to the Defense Advanced Research Projects Agency (DARPA) which provided the company with \$4.5 million in funding as part of their Immune Building Technology Development Program.

To address the energy consumption problem of the solution, Clark and his team initially developed a technology, based on creating very intense short-duration pulse UV, which allowed for the intensification of the UV by large factors without having additional energy sources. The company's researchers soon found, however, that continuous UV was just as effective if the intensity required could be produced, and that one way to do this was by using a cavity technique in which the intensity is multiplied with reflections within the cavity.

In fall 2002 Novatron applied to the Department of Defense (DoD)-supported Center for Commercialization of Advanced Technology (CCAT) for support in developing the new approach.

CCAT's market study confirmed that there would be a market for the technology in government applications, but also that other markets would be interested in AUVS.

With CCAT support the company continued to perfect its cavity technique, including controlling the air flow and finding the right reflective materials within the cavity. In late 2004 the AUVS prototype was completed. The AUVS boasts high reliability at a low cost, and the cavity design allows the system to consume less power than the original pulsing technology. The new design consumed only about 1,500 watts of operating power for 2,000 cubic square feet per minute air flow capacity, which is about the same amount as a standard hair dryer.

In May 2005 Novatron was selected to be part of a Department of Defense's Collective Protection Technology Readiness Evaluation program. In June 2005 a representative from the Pentagon Force Protection Agency called to discuss having Novatron install an AUVS (now called the BioProtector) unit. After the company provided more information to the Pentagon, DoD decided to contract the company to build a system and send it to the Pentagon in September. Installation was completed in early December 2005 and the system became operational on the same day.

Now that DoD has shown its interest, the company is looking to offer its technology in the medical markets and technical "clean rooms." It is not unreasonable to assume that as concerns about bio-terrorism increase, states and localities may sooner rather than later require the installation of Novatron — and Novatron-like — solutions in the HVAC systems of public buildings.

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