Sandia Decon Formulation for Mitigation and Decontamination of Chemical and Biological Warfare Agents, Chemical Toxins, and Biological Pathogens

Overview

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Sandia National Laboratories

Technology Need

A complete national program for protection against the chemical and biological warfare (CBW) threat must include elements for rapid response to such a threat. In the event of a domestic CBW attack, technologies to quickly decontaminate the area are necessary for two main reasons. First, the initial responders to the scene must be able to quickly decontaminate the area to a safe level to that casualties can be treated and evacuated. Second, a rapid, and complete restoration of the affected facilities is necessary so that they can be readied for re-use in a timely manner without loss of critical and expensive equipment. Sandia National Laboratories (SNL) has responded to this national initiative to combat the domestic CBW threat by developing an aqueous decon formulation.

Project Description

SNL has developed a nontoxic, noncorrosive aqueous formulation—Sandia Decon Formulation—for the rapid mitigation and decontamination of CBW agents. Sandia Decon Formulation can be deployed as a foam, liquid spray, or fog. Potentially, the formulation can be used by first responders to the scene of a domestic CBW attack and by personnel assigned to restoration of an affected facility after an attack. Experimental results on chemical and biological (CB) simulants and live CB agents indicate that the formulation works quickly, is effective against both chemical and biological agents, and does not generate toxic by-products (see also Sandia Decon Formulation Test Results fact sheet). The formulation is also highly effective against many classes of toxic industrial chemicals and a wide spectrum of biological pathogens, making its potential use applicable to a variety of hazard response scenarios and commercial applications. The U.S. military has also expressed considerable interest in the use of the Sandia Decon Formulation based on favorable test results and ease of logistical factors such as storage and deployment.

Variety of Deployment Methods

The formulation can be incorporated into a wide variety of carriers and deployed with various devices, depending on whether it is used as a foam, liquid spray, or fog. This diversity satisfies a wide range of operational objectives. For foams, depending on the volume of use, Sandia Decon Formulation has been successfully deployed by means of small handheld devices, similar to extinguishers, and in large-scale foam-generating devices (Figure 1). The formulation as liquid spray can be disseminated by means of commercially available paint sprayers. Commercially available cold foggers work well when deploying the formulation as a fog.

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NNSA
National Nuclear Security Administration

Figure 1. Large-scale foam deployment from Intelagard Falcon™ Fixed Site Decon System.

Significant Events

An earlier version (DF100) of the Sandia Decon Formulation was available for use during high-profile events such as the 2000 Democratic National Convention in Los Angeles, CA, the 3rd Presidential Debate in St. Louis, MO (October 2000), and the 2002 Winter Olympics in Salt Lake City, UT.

The DF100 formulation was successfully deployed as a foam to decontaminate anthrax in Congressional office buildings in Washington, D.C., and in commercial office buildings (where the formulation was deployed as a fog) in New York City in October and November 2001. The U.S. Military procured and fielded several hundred thousand gallons of the enhanced DF200 formulation in the Iraqi theater for potential use during Operation Iraqi Freedom during 2002 and 2003.

Advantages

- Decontaminates and mitigates both chemical and biological weapons agents, chemical toxins, and biological pathogens
- General disinfectant for bacterial spores, viruses, fungi, and vegetative cells
- Requires minimal logistical support
- Works quickly
- Can be deployed as foam, liquid, or fog
- Does not produce toxic by-products
- Environmentally friendly
- Easy cleanup

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

Patent Issued

U.S. patent number 6,566,574 B1 was granted on May 20, 2003. Additional U.S. and international patent applications are pending. The U.S. Government retains the technology for U.S. Government use. The U.S. Government has granted SNL the right to license and commercialize the technology.

Commercial Partners

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