

Chem/Bio Program

Fact Sheet

Building on its systems integration strengths, Sandia National Laboratories has developed a comprehensive Chem/Bio program to meet objectives in national homeland security and defense. Specifically, the program develops, demonstrates, and delivers technologies to mitigate the impact of chemical or biological attacks.

The broad program, underway since 1996, employs our unique capabilities to analyze, create, and integrate defensive systems. Capabilities in chemical and biological defense span training facilities for public health and emergency responders; expertise in computing, systems analysis, and engineering; and basic investigations in biology and sensing.



A Sandia researcher examines two petri dishes: one with a simulant of anthrax growing in it (left) the other treated with a new decontaminating foam developed at Sandia (right).

Systems analysis helps set direction for the overall program and individual technology areas. To understand the best uses of technology to address the chemical and biological threat, systems analysts

established a framework for assessing the value of technology within an overall defense system. Sandians have applied their expertise to projects addressing sensing, restoration, facility hardening, training scenarios, and enhanced exchange of public health data.

New approaches to civilian defense

R&D programs pursue new approaches to counter chemical and biological attacks. Researchers have advanced capabilities in agent detection, decontamination, modeling and prediction, and emergency response. For instance, Sandia researchers are prototyping a complete analytical "lab on a chip," μ ChemLabTM, that places detection of chemical or biological agents in the hands of a trained emergency responder. They are also supporting enhanced public health intervention through realistic training simulations and refined surveillance networks. Other researchers are elucidating insights into the underlying biology of toxicology and cellular response.

Sandia has developed a single decontamination foam that has rendered all typical chemical and biological agents harmless. It was already used to help eliminate anthrax in the Hart, Dirksen, and Ford buildings on Capitol Hill, and at contaminated sites in New York and in the Postal Service. The foam has been licensed to firms that are developing it for use in mass decontamination, spills, and hospitals. Small systems that look like a twin canister fire extinguisher are on the market, and may become standard issue for police, fire and emergency vehicles.

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.

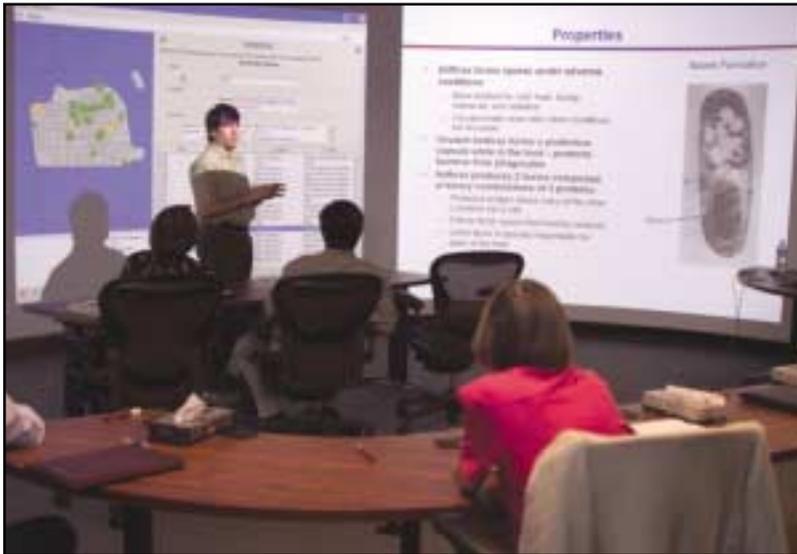


Chem/Bio program

Transit facility protection

A chemical sensor testbed and emergency response plan developed by Sandia and Argonne National Laboratory in 1997 to demonstrate an early warning system at the Washington, D.C. Metro recently went online as part of the subway's ongoing emergency preparedness operations. The sensor network is running at multiple Metro stations, and is now being expanded to other subway systems.

Meanwhile, both chemical detectors and prototype biological detectors have been fielded at the San Francisco International Airport as components of a future integrated monitoring system. Combined with guidance from researchers about emergency response options and facilities protection measures, that ongoing research is designed to provide a model to protect the nation's airports. The research team has also tested operational response strategies to known attacks to further mitigate the consequences of chemical or biological attack.



WMD-DAC demonstration in Visualization Design Center (VDC)
Bio-Defense Initiative

Emergency response analysis and training

Sandia has established a training and assessment capability at our California site that simulates the consequences of an attack on urban centers, the Weapons of Mass Destruction-Decision Analysis Center (WMD-DAC). The center allows participants to role-play decisions based on individual responsibilities and observe the impact. The simulation can assess the effectiveness of different defense system features, such as various sensor arrays, to define and test alternative large-scale defensive architectures.

Public health monitoring

Another Sandia software application is an Internet interface for medical surveillance, the Rapid Syndrome Validation Project (RSVP™). On RSVP, physicians report infectious disease signs and symptoms and receive current public health status information. The system maps the progression and state of infectious disease outbreaks before relatively slow laboratory confirmation. Installed in New Mexico, Texas, and California, RSVP™ provides early detection and warning of a bioterror attack or a naturally occurring public health problem. RSVP™ is being expanded to other states and countries.

Continuing efforts

These, and other projects, form a framework and foundation for continued and expanded efforts to provide integrated technical solutions for some of the nation's most pressing problems in homeland security and defense.

For more information contact
Sandia National Laboratories
Duane Lindner at (925) 294-3306
dllindn@sandia.gov