



PROTECT

(Program for Response Options and Technology Enhancements for Chemical/Biological Terrorism)



“Together, we will confront the threat of terrorism. We will take strong precautions aimed at preventing terrorist attacks and prepare to respond effectively if they might come again.”

—President George W. Bush
Swearing-in of Governor Tom Ridge as the
Director of Homeland Security
October 8, 2001

Citizens gathered in subways, airports, office buildings, and other interior spaces are an attractive target for chemical or biological attack, as highlighted by the 1995 Tokyo subway attack. The PROTECT program, under the National Nuclear Security Administration's Chemical and Biological National Security Program (CBNP), is addressing the unique challenges of protecting these populations by developing prototype warning and response systems that exploit advances in technology and existing infrastructure.

The PROTECT concept will provide first responders and law enforcement authorities with timely and accurate information about airborne chemical, and eventually biological, attacks in large public interior spaces. This information, and the crisis management tools PROTECT also provides, can combine to save lives by alerting responders, guiding their response, and facilitating rapid restoration of operations. The goal of PROTECT is to develop and demonstrate a prototype integrated, automated early warning and response system for key facilities. The PROTECT early warning system will detect and identify chemical aerosols, map contaminated areas, and assist responders in managing and mitigating the crisis.

Collaboration with users is vital for eventual integration of the PROTECT system into facility operation. Toward this goal, the Department of Energy has formed partnerships with the Department of Transportation and subway and airport authorities, as well as collaborating with representatives from industry and the first responder community.

PROTECT draws on existing fire and smoke emergency preparedness capabilities in developing response and mitigation plans for chemical and biological protection. The PROTECT effort currently includes exercises led by facility operators, training, and tool development (hardware and software) to assist in the management of a chemical crisis.

Subway Program

In partnership with the Washington Metropolitan Area Transit Authority, the Federal Transit Administration, and the National Institute of Justice, the PROTECT concept is being applied in the Washington, D.C. subway system. Smoke tests have been conducted to characterize and model airflow, and a detector testbed has been installed to evaluate detector performance in the harsh subway environment. In parallel, work is proceeding to develop tools to identify hazard zones below and above ground, and to recommend response strategies such as how to direct train traffic and conduct emergency control of ventilation systems. After a demonstration of the PROTECT concept in one station of the Washington, D.C. Metro in late 2001, a multi-station system demonstration is planned for 2003. Once the prototype system demonstration is completed, the technologies can be disseminated and could be commercialized for the Metro and other subway systems.



responders and the incident commander.



PROTECT has joined with the Washington Metropolitan Area Transit Authority to develop and demonstrate this technology on the Washington, D.C. Metro in the event of a chemical crisis.



Airport Program

NNSA is also working with the Federal Aviation Administration and airport authorities to apply the PROTECT concept to the defense of airports against chemical and biological attack. Field tests in June 2000 in a large U.S. airport terminal characterized the potential effectiveness of operational responses to such attacks. Appropriate airflow control (using HVAC air handlers) coupled with well-chosen personnel evacuation routes were shown to significantly reduce expected casualties. Tools and experience gained from the subway testbed are being used to design detection systems that enable these life-saving responses. An integrated demonstration of such a warning and response system is planned in an airport facility in 2002.

About the Chemical and Biological National Security Program

The Chemical and Biological National Security Program (CBNP) in the National Nuclear Security Administration (NNSA) Office of Nonproliferation Research and Engineering aims to develop, demonstrate, and deliver technologies and systems to improve the U.S. capability to prepare for and respond to chemical and biological attacks against civilian populations. The CBNP is structured to efficiently develop capabilities, both near- and far-term, that can have a major impact on defense against chemical and biological attacks. A key part of this strategy are Domestic Demonstration and Application Programs (DDAPs) such as PROTECT, which seek to combine advanced technologies with commercially available technologies to field capable, prototype operational systems in the 2-3 year time-frame. Such a systems approach is essential to fully illustrate, evaluate, and incorporate emerging technologies.

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