

## PROTECT Chemical Agent Detection & Response System

Proven Early Detection and Response Management for Chemical Agent Releases in Urban Infrastructures

### APPLICATIONS

#### Permanent Installations:

- Mass transit subway/ pedway tunnels
- Single- or multimodal transportation facilities (airports, bus terminals, etc.)
- Lower-level entrances and concourses
- High-value buildings and event facilities

#### Temporary Installations:

- High-threat events and remote locations

### BENEFITS

- Automated surveillance and alarm eliminates need for continuous operator supervision
- Customizable for accurate detection in dense urban infrastructures
- Quickly pinpoints release area(s) and projected dispersion zone(s) for faster response and containment
- Low false-positive rate backed by closed-circuit TV for fast verification
- Compatibility with many detector types

**PROTECT** is an automated hardware/software system that integrates chemical detectors, closed-circuit TV (CCTV), dispersion modeling, and optimal response protocols to improve detection and reaction to complex terrorist attacks involving chemical agents. The system provides accurate, early detection and verification in confined spaces within densely populated areas, such as in city buildings and urban transportation systems. Alarm and response management capabilities assist infrastructure operators and first responders by pinpointing release areas and projected dispersion zones and then recommending appropriate, predetermined response scenarios.



The **PROTECT** system has been successfully demonstrated for over one year in a major U.S. metropolitan transit system and is now being applied in other locations. Its surveillance components are also proven useful in responding to non-terrorist incidents involving fire, smoke, unknown substances, and a wide range of criminal activities.

Since each application is unique, each **PROTECT** installation is custom-designed and includes: (1) scenario analysis, (2) air-flow analysis, (3) detection and alarm, (4) responder information feed, (5) population and system flow

## LINKS TO ONLINE INFORMATION

[http://www.anl.gov/Media\\_Center/Frontiers/2003/b5excell.html](http://www.anl.gov/Media_Center/Frontiers/2003/b5excell.html)

## CONTACT INFORMATION

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## ABOUT ARGONNE TECHNOLOGY TRANSFER

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control management, (6) crisis management strategies and tools, (7) decontamination procedures, and (7) training and exercises.

In a subway application, for instance, **PROTECT** tracks changing chemical concentrations at every detector, individual train movements, and real-time meteorological conditions to calculate the transport and dispersion of a chemical vapor as it moves throughout the subway and up to street level. It can identify tunnel and station areas that are potentially hazardous and calculate above-ground hazard zones by estimating emission rates to the outdoors from vent shafts and station entrances.

An information management system integrates data from the chemical detectors, trains, CCTV cameras, and outside meteorological sensors. The information is available to the infrastructure operators on control room monitors and to outside first responders via the cables and laptop computers provided to them during their **PROTECT** training.

**PROTECT** recommends predetermined optimal response strategies to support emergency managers and personnel in the event of an attack. These strategies are based on the best scientific information available combined with the best operational procedures employed by each particular transit system. Standard operating procedures for hazardous chemical response using **PROTECT** are also incorporated into the information management system for quick reference. Procedures for outside responders are also revised to take **PROTECT** technology into consideration.

Training and exercises are provided to ensure transit or other infrastructure personnel and outside first responders are adequately trained and familiar with the technology and interfaces. Guidebooks, reference cards, and other materials are provided for initial training and follow-up use.



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