

EPA Recognized for Research on Reducing Risks to Drinking Water Systems

Threat Ensemble Vulnerability Assessment (TEVA) among finalists for Edelman Award

On February 7, 2008, the Institute for Operations Research and the Management Sciences (INFORMS® of Hanover, MD) announced that a TEVA research project is one of six finalists vying for this year's prestigious Franz Edelman Award. The project is called "Reducing Security Risks in American Drinking Water Systems."

Edelman Award Information

This is the thirty-seventh year of the Edelman competition. Every year, the competition recognizes outstanding operations research-based projects that transform companies, entire industries, and people's lives. Operations research uses advanced analytical methods to make optimal decisions in order to solve complex problems. The winner of the award will be announced in mid-April 2008.

Past Edelman Award finalists include Travelocity; IBM; Merrill Lynch; the Memorial Sloan-Kettering Cancer Center; and Georgia Tech. The winning team for 2007 reduced both patient suffering and health care costs from the treatment of prostate and breast cancer. The Edelman competition attests to the contributions of operations research in the profit and nonprofit sectors. It is estimated that the cumulative dollar benefits from Edelman finalist projects between 1984 and 2006 reached the \$100 billion mark.

EPA's National Homeland Security Research Center (NHSRC) develops products based on scientific research and technology evaluations. Our products and expertise are widely used in preventing, preparing for, and recovering from public health and environmental emergencies that arise from terrorist attacks. Our research and products address biological, radiological, or chemical warfare agents that could affect indoor areas, outdoor areas, or water infrastructures. NHSRC provides these products, technical assistance, and expertise in response to Homeland Security Presidential Directives (HSPDs) 7 and 9. HSPD 7 designates EPA as the lead agency for protecting water resources; HSPD 9 directs EPA to develop a robust surveillance program to provide early warning in the event of a terrorist attack. These HSPDs have led NHSRC to develop support systems, response plans, and contingency planning tools to enhance the safety of water treatment, distribution, and disposal processes.



TEVA Research Program

The TEVA research program has focused on reducing the security risks to drinking water systems. Addressing this issue is important because the physical layout of drinking water systems makes them inherently vulnerable to terrorist incidents. These incidents could involve contamination with deadly agents, resulting in large numbers of casualties and high economic costs.

In collaboration with the University of Cincinnati, Sandia National Laboratories, and Argonne National Laboratory, EPA has developed the Sensor Placement Optimization Tool (TEVA-SPOT) to quickly

detect contamination incidents and reduce the overall impact of terrorist attacks. The key component of the project is the TEVA-SPOT software program which uses algorithms to determine the number and location of sensors needed to support a contamination warning system, a system that integrates monitoring and surveillance data from multiple detection streams. The location of these online sensors is optimized to detect contamination incidents in time to mitigate both economic and public health consequences.

By partnering with member utilities of the American Water Works Association, EPA has made the TEVA-SPOT software tool available to many of the largest utilities across the country and has designed contamination warning systems for nine utilities to date. For even the largest municipalities that serve over a million customers, the tool is capable of running on desktop computers and achieving results in minutes to hours. Well-designed contamination warning systems may reduce the health impacts of terrorist attacks by 90 percent and reduce the economic consequences by billions of dollars.

For more information, visit the NHSRC Web site at www.epa.gov/nhsrc and the TEVA Research Program site at <http://www.epa.gov/nhsrc/water/teva.html>.

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