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By Pat West

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When a fire or explosion occurs at a chemical plant, refinery or other site involving any of the thousands of dangerous chemicals and hazardous materials used and transported across America every day, firefighters need a great deal of information fast. The problem is, they often don't have it.

Although Tier II forms provide responders with emergency contacts and the types and quantities of hazardous materials on the site and their hazard characteristics, they often are missing in action or out of date.



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According to a 2003 survey by the University of Texas at Dallas, Texas fire departments said they had only 30% to 70% of the Tier II forms they needed on hand. Worse yet, research by Corpus Christi Fire Chief Michael Hernandez found that about 93% of major metropolitan U.S. fire departments had never used Tier II forms during an emergency. The reason? The forms were not "readily available," despite laws requiring them to be filed with fire departments, local emergency planning committees and various state authorities.

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E-Plan, a new federally sponsored Internet-accessible repository for hazmat response information, is a major effort to change that. E-Plan is capable of providing a wealth of critical information in hazmat incidents at no charge to authorized emergency response personnel. With about \$3 million in funding from the U.S. Environmental Protection Agency, E-Plan has been developed through a cooperative agreement with the EPA, the Texas Council on Environmental Quality and UT-Dallas.

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Improved data flow

E-Plan began to evolve in 1997, when EPA Region VI, headquartered in Dallas, organized a volunteer task force of first responders, local emergency managers, academics, EPA staff members, and representatives of the chemical and transportation industries to figure out how to overcome the data speed bumps to emergency response at hazmat incidents.

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"The task force developed system specifications for an emergency information system that relied on existing sources of information, used simple user interfaces designed specifically for first responders, and was secure, reliable and broadly available," says James Staves, E-Plan's administrator and director of the Emergency Preparedness Center of the CyberSecurity and Emergency Preparedness Institute at UT-Dallas.

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The system is designed to resolve the breakdowns in the data flow to emergency response organizations that often occur because of various gaps and voids in filing requirements and a lack of interagency coordination. But the most common cause of the problem is paper. Traditionally a lot of the information has been submitted on paper, "where it remains, in static form, in file storage areas," says Staves. "Not only does paper prevent effective file-sharing with emergency responders, it also imposes a significant reporting burden on the industry."

Fire departments also face a considerable amount of paper-pushing to maintain records for hazmat response. Many departments carry huge, unwieldy notebooks of Tier II forms and Material Safety Data Sheets, which consume valuable department time and resources to update. Even departments that have the information stored electronically often must invest significant time to keep it updated.

Growing problem

Hazmat emergencies are a growing problem. "In 2001, the [EPA's] National Response Center took nearly 34,000 calls reporting accidental oil or hazardous substance releases," says Staves. "During the same year, the Agency for Toxic Substances and Disease Registry examined 8,978 significant hazardous substances emergency events, not including the World Trade Center disaster."

E-Plan bears similarities to another federally supported hazmat information system: OREIS. The Operation Respond Emergency Information System is software that provides first responders with access to real-time data about hazardous materials moving through the transportation industry.

Both systems share the goal of improving the flow of hazmat information to first responders at emergencies, but OREIS mainly provides information about hazardous materials in U.S. railways, trucking and ports, while E-Plan concentrates on hazmat information in fixed facilities.

"We have the same philosophy as OREIS," says Staves. "Our goal is to provide information free of charge — information that should be provided to fire departments anyway." He frequently mentions OREIS when speaking to fire departments about E-Plan, a comparison that highlights the growing number and use of hazardous materials in fixed facilities.

"Most people assume that transportation accidents are the major concern for injuries and health consequences," Staves says. "However, 6,736 of these events — 75% — occurred at fixed facilities." According to ATSDR, 1,920 people suffered injuries as a result of hazmat releases in 2001 at fixed facilities such as chemical plants, refineries and warehouses. Of those injured, 227 were first responders. Transportation accidents injured 247 people, 47 of whom were first responders.

As for OREIS and E-Plan merging into a single portal to hazmat response information, Staves says that could happen somewhere down the line: "I would certainly welcome the opportunity to collaborate in a formal way with OREIS so that a single login and password would give users access to information from both systems." But the national policy to support merging to the two efforts, however, hasn't developed yet.

User-friendly interface

E-Plan allows users to log on through a Web site at <http://erplan.net> for instant access to data stored in a secure online database that contains records for more than 20,000 facilities and 21,000 chemicals. Each record is hyperlinked to Department of Transportation Emergency Response Guides; Material Safety Data Sheets; and CHRIS, the Chemical Hazards Response Information System. Currently E-Plan maintains Tier II data sheets for all facilities in

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Arkansas, Louisiana and Texas.

If an incident occurs at a facility in an E-Plan-covered area, whether it be a water treatment plant, a chemical plant, a poultry plant or a refinery, the dispatcher or emergency responder can navigate directly to the facility's Tier II data. Clicking on the name of a chemical brings up its associated DOT Emergency Response Guide. With another click, responders can pull up MSDS, chemical profiles and data from the U.S. Coast Guard's hazmat response information system.

The system also has many hyperlinks to other Web sites with vast amounts of supporting resources, including the EPA, CAMEO, the U.S. National Response Team, the U.S. Fire Administration, the NIOSH Pocket Guide to Chemical Hazards, Geographic Information Systems mapping and weather information.

The threat of terrorists breaching the system to do harm with the information stored in E-Plan means Internet security must be a top priority. E-Plan uses 128-bit encryption, firewalls, a secure socket layer and other state-of-the-art technologies. Uninterruptible power supplies and redundant T1 connections to the Internet help ensure the system's reliability.

E-Plan also has hardened physical security. The system's data is stored in redundant servers, housed in "locked, shielded and secure locations," says Staves. Written and video records are maintained of all personnel that gain access to the storage location.

Only authorized users can access E-Plan. To become authorized, local county officials must approve response personnel. Once the user's identity is authenticated, the E-Plan administrator sets up an account with a unique user name and password.

Anyone with access to the Web, however, can take a demo tour of system with the user name "Demo-IM" and password "training." Only select demo pages are available, including the data for fictitious companies Ispec, Igno and Distill.

Navigation through the system is designed to be intuitive. "This was done by involving many first responders in the design process, until the format and content were deemed to be easiest for them to read and understand at times of extreme pressure," says Staves.

Real-world examples

E-Plan is used in 21 locations in the EPA's Region VI, which covers Texas, Arkansas, Louisiana, Oklahoma and New Mexico. Staves says that more than 700 emergency personnel have been trained as authorized E-Plan users in Texas, Arkansas and Louisiana.

As a beta-testing site in Collin County, Texas, Plano Fire-Rescue has had E-Plan in its dispatch center for four or five years, says Plano Bttm. Chief Phil Hamilton: "If necessary, we can access it from the stations, or have the dispatch center access it."

E-Plan pools a lot of information that's available from other sources. "It enhances what's already out there," Hamilton says. "It brings several things together." It has helped his department eliminate all the Tier II form paper-pushing and massive paper references on trucks for hazmat incident response.

It also helps keep him updated on the chemical hazards in his district. "It gives you the opportunity to go directly to a chemical database as you're looking at a business in your district, and [if] you see something there that you don't recognize, you can click on the chemical database and get that information within seconds, versus having to call CHEMTREC and get their information,"

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he says.

Plano hasn't had to use E-Plan yet, Hamilton says, but he's glad it's available: "We have some major thoroughfares running through town, and always having the tools gives you a little bit of relief. You know that you're preparing yourself for an incident that may happen, but we hope never happens."

Cities and counties in North Carolina, Ohio and New York are planning to go online this year. With support from a 2004 FIRE Grant, the Hickory (N.C.) Fire Department is planning to go online with E-Plan in wireless mobile data units on its fleet in June.

Asst. Chief Greg A. Rohr recommended E-Plan to his department after evaluating it as part of his October 2003 applied research project for the National Fire Academy's Executive Fire Officer Program. He looked at five computer-based electronic records-management systems for hazmat incident pre-planning and response.

"E-Plan is easy to use and provides information in a clear and concise manner," Rohr wrote in his research report. "It allows quick access to information that a first-arriving engine company would need about hazardous materials and provides more complex and detailed information that would be needed to manage a large hazardous materials incident. Navigating between screens is easy, the grouping of information is conducive to decision making and the information is to the point and easy to read."

Rohr was impressed with the way E-Plan parsed information: "Although someone may argue that there is no such thing as too much information, if the information is not properly organized it can be overwhelming. This program does an excellent job of organizing a tremendous amount of information in a manner that can be utilized by units responding to an emergency."

Rohr says that another advantage of E-Plan is that allows incident commanders to expand into CAMEO if the incident warrants it, providing access to real-time plume dispersion modeling software. The fire department has selected 12 Motorola laptops that will require fingerprint scans for login, further restricting unauthorized access to E-Plan information.

National rollout

The EPA is currently reviewing a strategy for national implementation that may extend E-Plan to other states across the nation soon. Staves is looking for a dependable source of long-term funding to support the national expansion of E-Plan.

"We are preparing a draft national strategy to provide EPA's Office of Emergency Management," says Staves. "We also believe that obviously this would be a good tool to assist the Department of Homeland Security in accomplishing its mission, so we would also like to find a way to work more closely with DHS."

Staves says continued funding is needed basically only to pay for system administration. Like most electronic ventures, most of E-Plan's cost was in its development. The system expanded initially in EPA Region VI because it was the initial source of funding, but with the support of a multi-year contract, Staves feels it's ready for national rollout. He envisions expansion on a voluntary state-by-state basis.

"Which [federal] region the states are in is really not important. What is important is that states have a strategy for accepting electronic filing of their Tier II forms and have databases set up to handle their forms," Staves says. "It really takes very little time and expense to bring a new state into the system."