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Homeland Security Interoperability·Today

A RESOURCE FOR THE PUBLIC SAFETY COMMUNITY

INTEROPERABILITY INSIGHTS

Digital Television Means More Spectrum

A law that requires television broadcasters to convert to digital television in 2009 will free up broadcast spectrum for public safety use, markedly improving communications for the Nation's first responders.

The legislation, the Digital Television Transition and Public Safety Act of 2005, is part of a broad deficit-reduction bill passed by Congress and signed by the President into law earlier this year. It requires television stations to complete the transition from analog to digital television by February 17, 2009, which will release valuable radio spectrum in the 700-MHz band for public safety and commercial use.

Twenty-four MHz of the spectrum in the 700-MHz band is allocated for use by public safety agencies (channels 63, 64, 68, and 69). Licenses for the rest of the recovered spectrum will be issued for commercial use through auction by the Federal Communications Commission (FCC). Of the estimated $10 billion or more the auction is expected to generate, $1 billion will be used to fund a grant program for interoperable communications systems for public safety.

Digital television is more efficient than analog television technology. It allows the same number of television stations to broadcast program material using less radio spectrum, freeing up that spectrum for other uses.

The Time Has Come

The FCC allocated the 24 MHz of spectrum to public safety in 1998. Television broadcasters continued using those channels because the law allowed them to stay in the 700-MHz band until the later of two dates—December 31, 2006, or when 85 percent of television households in their market areas could receive digital transmissions. The public safety community has pressed for the setting of a firm date for when it would have access to this spectrum and the elimination of the 85-percent provision.

"We've been working for a long time to establish a hard date because the 85-percent provision created a huge loophole," says Bob Gurss, Director of Legal and Government Affairs for the Association of Public-Safety Communications Officials-International (APCO). "This is a very positive step, in addition to providing funding, which is important."

"The effort to get a firm date for broadcasters to vacate the spectrum has been led by a number of national organizations representing public safety and local government," says Harlin McEwen, Chairman of the Communications and Technology Committee of the International Association of Chiefs of Police (IACP). McEwen, a retired police chief from Ithaca, New York, also serves as communications adviser to the Major Cities Police Chiefs Association (MCC), National Sheriffs' Association (NSA), and the Major County Sheriffs' Association (MCSA). The principle organizations involved in the effort to clear the television spectrum are APCO, IACP, MCC, NSA, MCSA, the Congressional Fire Services Institute, International Association of Fire Chiefs (IAFC), National Association of Counties, and National League of Cities.

Enhanced Public Safety Communications

Public safety agencies operate in assigned frequencies across 10 disparate bands scattered across the radio spectrum, which affects public safety agencies' ability to communicate across agencies and jurisdictions. Access and reliability in communications are critical to public safety operations.

The release of the spectrum will alleviate serious congestion along public safety airwaves by adding capacity for operations. "It will help agencies communicate with their own people by getting rid of crowded channels," Gurss says. The additional spectrum also will enable public safety agencies to

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DIRECTOR'S MESSAGE

SAFECOM and Disaster Management Team Up

Interoperability is more than just communication between different radio systems. Successful interoperability requires integration of all aspects of public safety response, including but not limited to voice and data communications.

That is why it is important for the Office for Interoperability and Compatibility (OIC) to address all aspects of interoperability. The December 2005 transfer of the Disaster Management (DM) E-Gov Initiative from the Federal Emergency Management Agency (FEMA) to OIC is an important part of that effort.

"Our major focus is developing and implementing information exchange standards for the emergency response community," says Chip Hines, DM Program Manager. "Disaster Management aligns very well with OIC's interoperability mission by complementing SAFECOM, OIC's voice interoperability program, with a data interoperability and information-sharing component."

The program, Hines says, has four components: the DM Messaging Standards Initiative, which facilitates the development of data messaging and information-sharing standards; Disaster Management Interoperability Services (DMIS), a Web-enabled tool that provides the public safety community with basic incident management tools; the Open Platform for Emergency Networks (OPEN), the supporting infrastructure necessary to share information; and Disasterhelp.gov (*www.disasterhelp.gov*), a Web portal that contains disaster-related information and services for citizens and public safety organizations.

DM Messaging Standards Initiative

The development of data exchange standards is critical to the public safety community. Uniform data exchange standards enable communities to share data across disparate information systems. The public safety community drives the process and development of these standards. After a standard is approved, the messaging standards initiative works directly with private industry to encourage the standard's implementation into information systems and products. This public-private collaboration ensures standards will be integrated into products used by the public safety community.

DMIS

Many organizations lack the tools needed to share information between members of the public safety community. DMIS is a free, Web-enabled software product that provides the capability for the public safety community to share data and communicate before, during, and after an incident. Although DMIS is Web-enabled, it is not browser-based; therefore, if connectivity is lost, responders can continue to work until connectivity is regained, and the information will be synchronized. The

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About Interoperability • Today

The Department of Homeland Security (DHS) established the Office for Interoperability and Compatibility (OIC) in 2004 to strengthen and integrate interoperability and compatibility efforts to improve local, tribal, state, and federal public safety preparedness and response. Managed by the Science and Technology Directorate's Office of Systems Engineering and Development, OIC's mission is to facilitate the coordination of interoperability efforts across DHS. OIC, as a practitioner-driven office, is strengthening public safety's ability to work together to protect lives and property. SAFECOM, a communications program of OIC, works with its federal partners to provide research, development, testing, evaluation, guidance, tools, and templates on communications-related issues to local, state, and federal public safety agencies.

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SAFECOM

Homeland Security

UPCOMING

Events & Conferences

This listing provides information about upcoming events and conferences pertaining to interoperability.

International Wireless Communications Expo (IWCE)
May 17–19, 2006
Las Vegas, NV
www.iwceexpo.com

Association of Public Safety Communications Officers - International, Inc. (APCO) Annual Conference & Exhibition
August 7–9, 2006
www.apco2006.org

INTEROPERABILITY INSIGHTS • *continued from page 1*

use technologies such as data system communications tools to transmit data and video back and forth, and it will greatly enhance interoperability.

"It offers the potential for the use of advanced technologies such as wideband data, additional voice channels, and interoperability channels," says Tom Chirhart, Spectrum Program Manager for SAFECOM. "It will enhance interoperability since the new band includes specific interoperability channels."

The additional spectrum will allow dual-band capability because of the close proximity of the 800-MHz and 700-MHz bands. "Interoperability benefits flow a couple of ways," Gurss says. "A lot of public safety systems today are in the 800-MHz band [which is adjacent to the 700-MHz band]. The additional spectrum will facilitate interoperability between those bands."

It will allow public safety agencies to replace aging communications systems. "There are legacy systems out there that have outlived their life cycles," says Alan Caldwell, senior adviser on government relations to IAFC. "Virtually no spectrum is available in the 10 bands in use now, so new communications requirements are difficult to meet without the new spectrum."

Although the spectrum is available in some areas, most metropolitan areas cannot use the spectrum until television stations vacate. With a clear date for release of the additional spectrum, public safety and industry can move forward with planning for implementation.

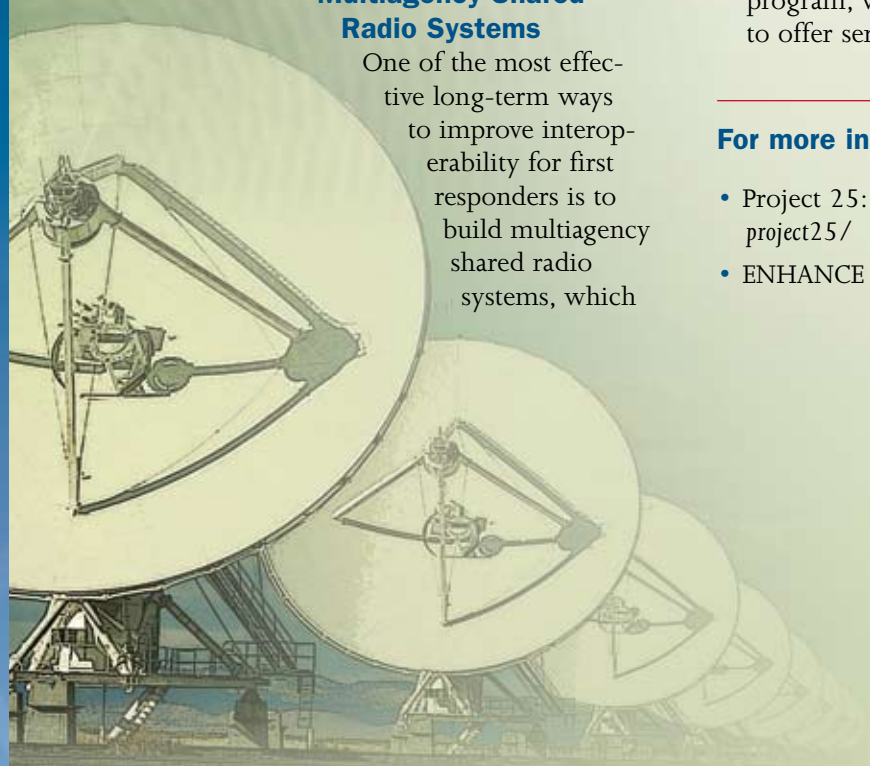
"With the firm date set, public safety can begin identifying the resources and funding to begin planning, design, development, and implementation of new systems using licensing in the 700-MHz band," Chirhart says. "It also gives manufacturers a timeframe of how soon they will need to have products available that will operate in this band, including dual-band capable equipment [700/800 MHz]. There is a limited amount of equipment available now that will operate in both bands."

"Knowing the firm date is really everything because only when we know that we have something, not just a promise, can local governments begin planning," Caldwell says. "Money has to be raised and plans have to be made. No jurisdiction is going to begin a planning process for something that we don't know is real, so making this date certain is terribly important for planning purposes."

FCC rules for the 700-MHz band ensure that radios operating within the 700-MHz band include designated interoperability channels. A digital interoperability suite of standards, Project 25, ensures that radios from different manufacturers can communicate in a digital environment.

Multiagency Shared Radio Systems

One of the most effective long-term ways to improve interoperability for first responders is to build multiagency shared radio systems, which require spectrum. The addition of 700-MHz band spectrum will allow for new and expanded multiagency communications systems. The FCC rules for the 700-MHz band encourage but do not require countywide and regionwide networks.



Fifty-five regional planning committees across the country are responsible for managing the portion of the 700-MHz public safety spectrum designated for general use by local, regional, and state users. Each region is required to develop a plan and submit it to the FCC for approval.

Since 1998, when the FCC took action to allocate additional spectrum to public safety, "a lot of work has been done to develop rules and procedures for using these bands, so that people will be able to start using them fairly soon once they have funding and planning in place," Gurss says.

The spectrum licenses that will be auctioned off are in demand by equipment, telecommunications, and software companies that could offer expanded and advanced wireless and broadband services.

Most of the $10 billion expected to be generated by the auctioning off of the spectrum for commercial use will go toward reducing the federal deficit ($7.3 billion). In addition to the $1 billion for public safety interoperability communications grants, the legislation includes the following allocations of interest to the public safety community:

- $156 million for a modern national hazards alert and warning program for natural disasters (including tsunamis), manmade accidents, and terrorist incidents. The program will encourage the use of new technologies such as wireless communications devices, satellite radios, and personal computers to enhance the Nation's current emergency warning capability.
- $43.5 million for grants to implement the ENHANCE 911 Act of 2004. The grants can be used to enhance 911 communications systems to enable emergency communications centers to know the location of emergency callers who telephone 911.

Also included are the following:

- $30 million for New York City broadcasters to build interim facilities to ensure that the New York metropolitan area can receive an adequate digital broadcast signal until new facilities atop the Freedom Tower are completed. The Freedom Tower will be built at the site of the World Trade Center, which was destroyed in the September 11, 2001, terrorist attacks.
- Up to $1.5 billion for a program to help households with analog television sets purchase converter boxes so they can receive digital signals.
- $65 million for a program to convert low-power television stations and television translator stations from analog to digital transmissions.
- $30 million in grants for the Essential Air Service program, which provides subsidies to air carriers to offer service at small airports.

For more information:

- Project 25: *www.apcointl.org/frequency/project25/*
- ENHANCE 911 Act of 2004: *www.nena.org*

INDUSTRY REPORT

NIST Pushes Progress in Standards Development

The Department of Commerce's National Institute of Standards and Technology (NIST) is driving progress in standards development. By using its expertise in measurement, standards, and technology, NIST is helping to equip first responders with systems aligned with critical interoperable communication needs. NIST's Office of Law Enforcement Standards (OLES) serves as the technical and standards lead for the Office for Interoperability and Compatibility's (OIC's) SAFECOM Program.

To identify first-responder needs and advance standards necessary for wireless interoperability, NIST works with the public safety community, private organizations, and federal, state, and local governments. In validating users' requirements, NIST considers both technical and operational needs and evaluates factors internal and external to the public safety community that might hamper standardization efforts. NIST also characterizes current and emerging technologies and provides engineering support for standards efforts.

According to Dereck Orr, Program Manager for Public Safety Communications Systems at OLES, such standards development efforts are pivotal to advancing interoperability.

"Achieving interoperability is not possible without the existence of standards that define how the various components of a public safety communications system will interoperate, regardless of manufacturer," Orr says. "The public safety community expects that interoperability will be available using equipment from multiple manufacturers that is transparent to the user, requires little or no special knowledge of the system, and is not dependent on common frequency assignments."

Last year was marked by progress, and, as Orr says, "We have seen significant progress over the last several months, and I am confident that we will see further progress over the next 12–18 months."

Project 25 Progress

One suite of standards that has seen significant progress over the past year is Project 25 (P25). Launched in 1989, P25 is intended to provide detailed criteria for the design of public safety land mobile radio communications systems so that communications equipment will be interoperable, regardless of the manufacturer.

In October 2005, the P25 suite of standards adopted two new interfaces. The *fixed station interface* describes the signaling and messages between the radio frequency scanning system (RFSS) and the fixed station. The *console interface* defines all signaling and messages between the RFSS and the console, the position a dispatcher would occupy when providing commands and support to personnel in the field. Within a month, public safety agencies referenced these two standards in procurement requests and vendors were building new products to meet the standards, Orr said.

Orr expects P25 to adopt a third standard, the *inter-RF subsystem interface* (ISSI), by March 2006. ISSI is considered among the most important standards because it enables users to communicate across jurisdictions and disciplines.

To improve the rate of P25 compliance, NIST is working with OIC and other federal partners to develop a P25 conformity assessment program. The program will ensure that public safety agencies purchasing wireless devices and systems designated as P25-compliant can be confident that the purchased equipment actually meets P25 standards.

P25 Conformity Assessment Program

Components of the conformity assessment program will include:

- SAFECOM grant guidance requiring that P25 products purchased with federal funds meet the requirements of the conformity assessment program.
- Third-party testing by NIST-accredited independent laboratories to evaluate compliance with P25 standards.
- Establishment of a formal suppliers' "declaration of conformity" to P25 requirements, with results made available to the public safety community.

NIST expects to complete preliminary implementation of the program by the end of 2006.

For more information:

- Project 25: *www.apcointl.org/frequency/project25/*
- Office of Law Enforcement Standards: *www.eeel.nist.gov/oles*
- National Institute of Standards and Technology: *www.nist.gov*

DIRECTOR'S MESSAGE • *continued from page 1*

public safety community can register a user group and receive the basic DMIS incident management toolset by logging on to *www.dmi-services.org*. Each user group has the ability to include any and all emergency response organizations within the city, region, or county. Charlottesville, Virginia, Fire Chief Charles Werner says, "DMIS offers a disaster interoperability/management solution that can be used by all—big and small—and best of all, it's free, so it addresses the need of even the smallest agencies with very limited financial resources."

DMIS provides users with:

- The ability to send and receive emergency alerts and need requests (supported by the Common Alerting Protocol standard).
- A comprehensive mapping tool that displays incident-critical information including incident, triage, and shelter location.
- A tactical information exchange that allows users to track and share situational awareness of an incident.

OPEN

OPEN is an interoperability backbone and infrastructure with common service functions that allow for the exchange of incident-related information between multiple responders and vendors, regardless of the incident management system they use. The DM program provides OPEN so that vendors and other response organizations using proprietary systems can still share information with each other securely.

DisasterHelp.gov

DisasterHelp.gov, a Web-based collaborative effort of local, tribal, state, federal, and related nongovernmental organizations, provides citizens and public safety organizations with a unified point of access to disaster-related information. Members of the public safety community and the general public can register as verified users to search and view disaster-related information.

Disasterhelp.gov provides:

- A unified access point to nationwide disaster-related information, including news headlines and notifications.
- Community pages that allow users to display external Web pages, updates, and alerts; a shared calendar; and links to disaster-related resources.
- Enterprise Collaboration Centers to quickly and easily share files with authorized users.
- A Readiness Assessment Tool that allows organizations to self-assess, track, and report on preparedness levels.
- Personalized Web pages and calendars that enable users to tailor searches and information displays.

Other Standards Initiatives

The public safety community is also using a Department of Justice (DOJ)-sponsored initiative known as the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM). Global JXDM includes a data model, a data dictionary, and an XML schema. More information and existing implementations can be found at *www.it.ojp.gov*.

Global JXDM is the base technology for the National Information Exchange Model (NIEM), which is cosponsored by the U.S. Departments of Justice (DOJ) and Homeland Security (DHS). Through NIEM, DOJ and DHS aim to provide the groundwork for national interoperable information sharing and data exchange. NIEM has involved the collaborative work of DM representatives, the Global JXDM initiative, and other local, tribal, state, and federal agencies. More information about this initiative can be found at *www.niem.gov*.

Together Again

Both SAFECOM and DM were housed in FEMA as a joint program office in 2003. DM's move to OIC rejoins the two programs in the effort to improve communications within the public safety community.

OIC, along with the DM program and its partners within the practitioner and business communities, strives to develop new tools and methods that will help the public safety community be better informed, safer, and more effective in responding to disasters.

Technology: Silicon Valley

Pushing Progress: The Interoperability Continuum is featured in every issue of Interoperability Today. It showcases the achievements of organizations working to advance interoperable communications and demonstrates how these groups are progressing along the lanes of the Interoperability Continuum, SAFECOM's framework for promoting and evaluating interoperability improvements. This issue addresses technology in Silicon Valley, California.

The technology supporting California's emergency responders in the Silicon Valley has advanced leaps and bounds beyond the patchwork of radio frequencies and equipment that once supported the region's public safety operations.

The region's progress in interoperable communications gained momentum in 1998 when, at the direction of the Santa Clara County/Cities Managers' Association, the Santa Clara County Police and Fire Chiefs associations established two working groups to study the region's interoperability issues. These working groups later merged under a joint agreement between 18 Santa Clara County jurisdictions representing some 30 law enforcement, fire, and emergency medical services agencies to form the Silicon Valley Regional Interoperability Project (SVRIP).

SVRIP aims to strengthen interagency coordination and enable the region's first responders to exchange critical information and resources in real time by:

- Establishing seamless voice and data interoperability between emergency responder agencies throughout the Silicon Valley and the surrounding region.
- Enhancing dramatically the information management and information-sharing capabilities of incident commanders and emergency responders.
- Assisting law enforcement agencies in leveraging intelligence and information-sharing capabilities to combat terrorism threats and provide a portal to share information with other regions and state and federal law enforcement officials as they combat terrorist threats.
- Improving the response quality and overall interaction among federal, state, and local incident commanders and emergency responders.

Focus on Existing Systems

SVRIP's approach to technology solutions has proven invaluable to advancing these aims. Rather than concentrating efforts on acquiring new hardware and software, SVRIP is focusing the majority of its efforts on engineering technology solutions using existing systems.

As Gilroy Fire Chief Dale Foster notes, "The easy answer, the quick-fix-it answer, is to buy all new stuff. But all new stuff is not going to help me communicate with the fire department in the neighboring jurisdiction. The focus needs to be on engineering solutions. We have to make the distinction between interoperability and buying a new radio."

To ensure that technologies provide long-term solutions, SVRIP sought an independent technical assessment of its projects and design specifications from the Interoperable Communications Technical Assistance Program (ICTAP) of the Office of Grants and Training. SVRIP further strengthens the longevity of its solutions by engineering processes that build on existing, off-the-shelf technologies, use a systems integrator, and are based on industry standards.

Guided by these principles, SVRIP took advantage of Silicon Valley's legendary technological vision to engineer ambitious technology solutions, including the:

- Bay Area Mutual Aid Communications System (BayMACS).
- Voice over Internet protocol (VoIP).
- Emergency communications (E-Comm) Regional Microwave Network.
- Private broadband wireless network.
- Computer-aided dispatch (CAD)-to-CAD system.
- Records management system (RMS)-to-RMS system, otherwise referred to as the "Regional Interoperability Information Broker" (RIIB).

To improve communications between Silicon Valley's public safety agencies operating on four different radio spectrums, SVRIP used FY 2001 State Domestic Preparedness Program funds, granted by the Emergency Preparedness Council, to establish the region's first interoperability channel. On September 11, 2003, the BayMACS channel went live, and for the first time, Silicon Valley's emergency responders—regardless of discipline or jurisdictional boundary—could effectively and seamlessly communicate with each other.

SVRIP is seeking funding to implement the project's network-based VoIP/radio solution, which will operate as an extension of existing interoperability channels, interconnecting voice communications via internet protocol (IP). The engineered technology uses standard IP networking equipment and standards-based control applications. The base station and console voice outputs are digitized for network transmission, and the interoperability is managed by software application. Redundancy in network control will ensure reliability.

In October 2003, SVRIP received $3.7 million (augmenting the $6-million project) to build a regional microwave network that would serve as the backbone for future voice and data communications needs. The resulting infrastructure, E-Comm Regional Microwave System, serves as the regional digital microwave-based "information highway," enabling Silicon Valley emergency responders to securely exchange and share voice and data. E-Comm is robust enough to allow other existing systems to use it, resulting in significant cost savings for public safety agencies.

San Jose State University Demonstration Project

SVRIP is completing the installation of a private broadband wireless network at San Jose State University using a licensed spectrum (2.5 GHz). The network is intended to serve the university's campus police, local law enforcement, and local fire departments as a testing ground for applications, including:

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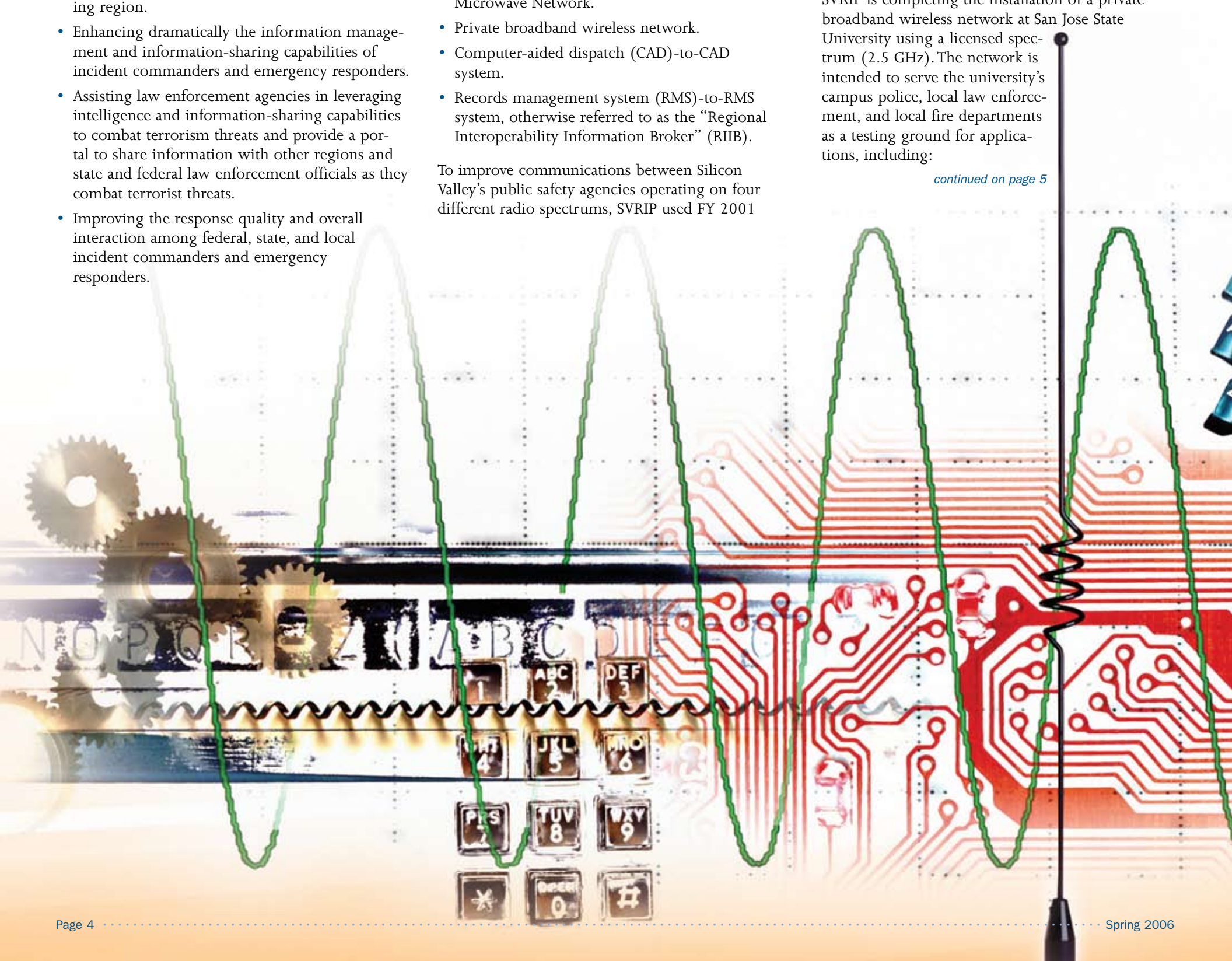

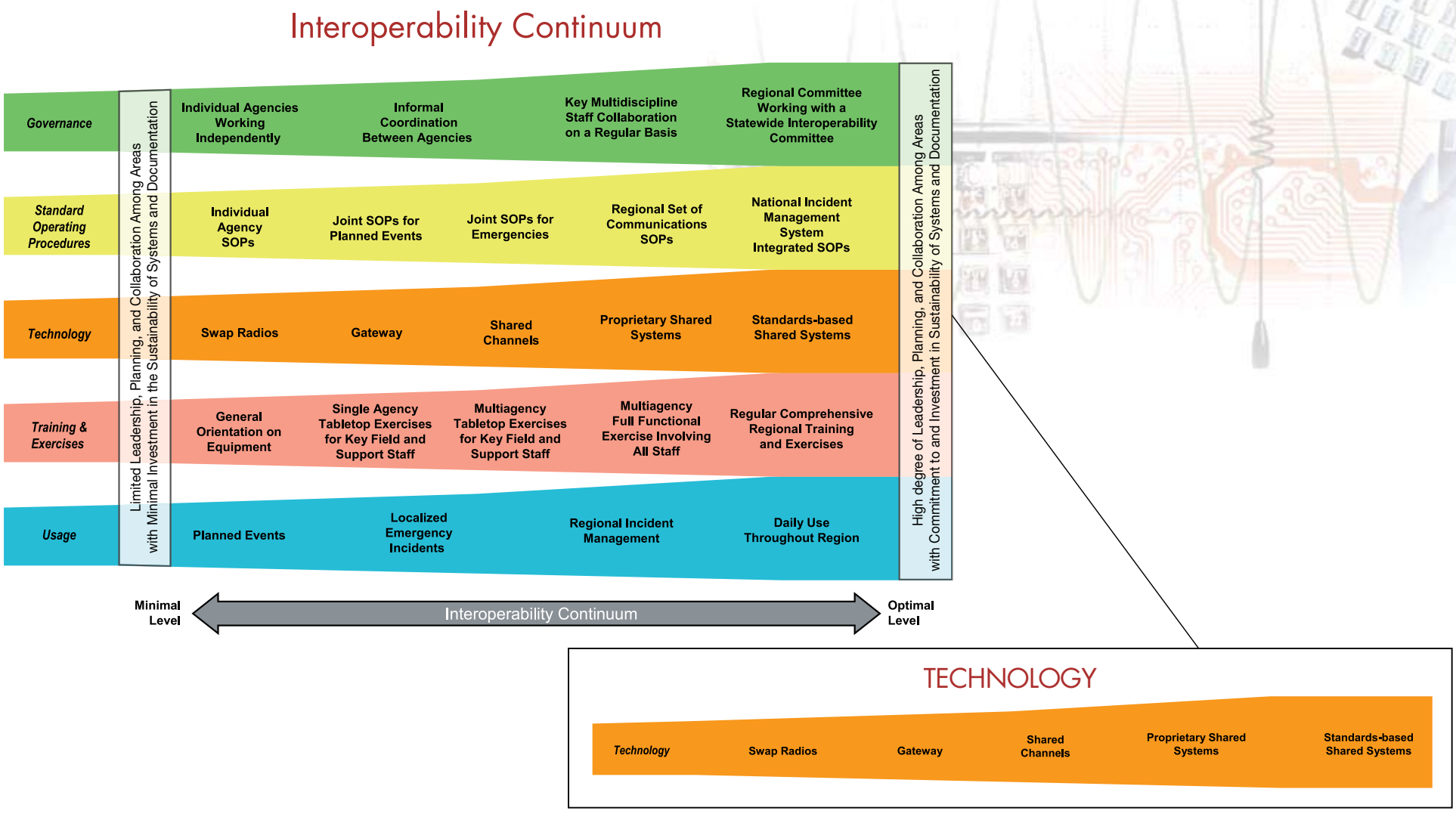

PUSHING PROGRESS • *continued from page 4*

- Biometrics.
- Photo transmission.
- Missing-student search coordination.
- CalPHOTO, the state's central repository for law enforcement records and identification information.
- CalGANG, a database of information collected on gang members and their crimes and affiliations.
- Technology to Recover Abducted Kids.
- Automated vehicle location.
- Local criminal offender information.

In 2003, SVRIP contracted with an outside firm to serve as its systems integrator to design a roadmap for interoperability predicated on an IP-based data communications network. Using digital microwave, fiber optic lines, land mobile radio systems, and commercial and private wireless technologies, the system will deliver services for voice and data communication and sharing. Its RIIB technology combines IPs, database technologies, and access control and sharing logic to connect regional command and control (dispatch) systems' databases and to facilitate navigation and pertinent information extraction and sharing.

SVRIP's "CAD-to-CAD RIIB" is a data integration solution that allows multiple disparate CAD systems to exchange and share information. The system will facilitate efficient communication and exchange of information among communication centers and first responders. SVRIP will implement the CAD-to-CAD system once funding is secured.

The "RMS-to-RMS RIIB" is a regionalized integrated data solution designed to exchange and share critical intelligence information between multiple disparate RMS applications. Once funding is secured for its implementation, the system will assist in the prevention of criminal activity and facilitate communication and exchange of information across disciplines and jurisdictions.

Miles Ahead

These technologies have had a significant impact on the Silicon Valley's emergency responder community.

"Today we're miles ahead of where we were in 1998. Today I can pick up a radio and talk to the [City of Gilroy] fire chief. I couldn't do that seven years ago," says Stephen D. Lodge, Chief of the Santa Clara Police Department, who currently serves as the chair for the project's Executive Oversight Committee.

"Every single after-action report for disasters—natural and manmade—talks about how many lives were lost because first responders couldn't talk to each other. The value of these technological advances is tremendous. When 'the earthquake' occurs in the Silicon Valley, our after-action report won't say that lives were lost due to lack of communication between the first responders. At the same time, we recognize that this achievement is but one step in a large process."

SVRIP leaders are quick to note that although technology is a critical tool for improving interoperability, it is highly dependent on sound governance.

TECHNOLOGY TIPS

Silicon Valley Regional Interoperability Project

- Thoroughly assess technologies to ensure that those purchased or engineered effectively meet the needs of the region and its emergency responder community. What works for region X may not work for region Y.
- Use current capabilities of existing infrastructure.
- Concentrate efforts on technologies with high reliability and demonstrated performance rather than quick-fix purchases.
- Use open, nonproprietary technology solutions whenever possible.
- Obtain a third-party, independent assessment of technology solutions and design specifications. The ICTAP program and its engineering and program experts are an invaluable resource to emergency responder agencies working on interoperability initiatives. More information about ICTAP can be found at *http://www.ojp.usdoj.gov/odp/ta_ictap.htm.*
- Unify local leadership and clearly define the mission and scope of governing bodies.
- Support interoperability progress nationwide by sharing best practices with other communities.

"Implementing and purchasing technology requires solid governance," says Sheryl A. Contois, Director of the Technical Services Division of the City of Palo Alto Police Department, who serves as vice-chair on the project.

SVRIP's unified local leadership has proven essential to the region's technological progress along the Interoperability Continuum.

"The project maintains a relationship between the local jurisdictions," Foster says. "It creates a regional cooperative arrangement that fuels an interest in and focus on working through these interoperability challenges together and improving these systems as opposed to throwing our hands up in the air and just looking to the federal government to fix our problems for us."

STATE REPORT

Maryland's Interoperability Efforts Extend Beyond State Borders

The impact of interoperability initiatives in Maryland's Anne Arundel County reaches well beyond the national capital area.

Last September, Anne Arundel County deployed one of the Nation's first-ever totally interoperable mobile command and communications units (MCCU-1) to the gulf coast, where it provided a vital link for emergency personnel responding to Hurricane Katrina.

For more than two weeks, MCCU-1's interoperable communications network helped save lives by successfully connecting Louisiana authorities, the Maryland National Guard, emergency medical personnel, and multiple public safety agencies. The mobile unit provided medical communications support for more than 6,000 people by enabling emergency responders to coordinate the dispatch of emergency medical technicians to temporary clinics positioned throughout Jefferson Parish, Louisiana. "It exceeded expectations. This unit has helped us save lives," County Executive Janet S. Owens says.

New Technology Put to the Test

Anne Arundel County dispatched the 40-foot, 27-ton MCCU-1 to Louisiana just weeks after unveiling the vehicle as part of the county's efforts to achieve interoperability across multiple public safety agencies during emergencies.

The MCCU-1 is equipped with a new technology system, designed and integrated by an Annapolis, Maryland-based company that links emergency radio systems, telephones, wireless systems, and data networks. By digitizing signals from any connected device into a common Internet protocol (IP), the IP architecture allows the technology to connect virtually any communications devices. A satellite connection also allows video teleconferencing and real-time remote video surveillance.

Anne Arundel County Fire Chief Ronald D. Blackwell was both excited and skeptical when the county used a state-administered homeland security grant to purchase the mobile unit. As someone involved with emergency responders on a daily basis, he saw the need for the technology and, at the same time, was anxious to see the MCCU-1 perform in the field. "It passed the Katrina test," Blackwell says.

Within 24 hours of setting up its central communications site at the evacuated Meadowcrest Hospital, the MCCU-1 crew of fire personnel, county electricians, and company representatives teamed up to link dozens of separate radio systems being used by emergency responders in the New Orleans area.

By its second day, the MCCU-1 crew had integrated and programmed several different mobile and portable radios obtained from public safety and federal agencies. Using these units, MCCU-1 began to operate as a dispatch and monitoring station for emergency medical services personnel, state police, National Guard units, and the Jefferson Parish Emergency Management Office in the field and at clinics. A built-in generator kept MCCU-1 running throughout the operations.

County Plays Role in National Security

The addition of the MCCU-1 to Anne Arundel County's emergency response fleet is part of the county's robust interoperability agenda. Astounded by the communications breakdowns on September 11, 2001, County Executive Owens has made advancing interoperable communications one of her top priorities. "If our brave first responders can't communicate, they can't respond to our citizens, and they put their own lives at risk."

In January 2002, Owens introduced legislation enacted by the county council to halt radio interference caused by cell towers. In 2003, the county further bolstered its interoperability capacity by purchasing an 800-MHz public safety radio system to improve communications reliability for the county police and fire departments.

These interoperability initiatives are critical to Anne Arundel County's emergency responders, as interoperable communication in the county has national implications. Anne Arundel County oversees a considerable share of critical national infrastructure including the National Security Agency, the United States Naval Academy, the Chesapeake Bay Bridge, the Baltimore/Washington International Thurgood Marshall Airport, and more than 500 miles of the Chesapeake shoreline. The county is also home to Annapolis, the state's capital.

Anne Arundel County will likely use the MCCU-1 as a primary operations center in emergencies. Owens and Blackwell agreed that the mobile unit is a tremendous emergency response asset that can be used in national disasters beyond Maryland's borders.

SPOTLIGHT

Mountains and Backcountry: Idaho's Interoperability Challenge

Dirk Kempthorne, Governor of Idaho, grew up in Spokane and is intimately familiar with the mountainous backcountry terrain that creates a unique interoperability challenge for his western state. Previously serving in the U.S. Senate and as Mayor of Boise, the second-term Governor says he never considered any career other than serving as a public servant in some capacity, because "there is no greater honor."

"The trust shown to me by the voters of Boise and Idaho through 20 years of public service provided the best incentive to be as prepared as possible for all situations," Kempthorne says. "A day hasn't gone by that I haven't sought out the knowledge I needed to make the right decisions on behalf of the people of Idaho."

The Kempthorne administration plans to meet the interoperability challenge by keeping the communications equipment that we all rely on as modern and up to date as possible, "so that the advantages of technology are working for us, rather than being satisfied with the status quo or equipment that is merely adequate."

Q&A With Governor Dirk Kempthorne

Q. What have you learned from your job about the importance of interoperability for first responders?

A. Idaho's rugged topography and remoteness present great challenges for first responder agencies. Getting timely information from the site of an incident is key to the response our public safety agencies are able to make. Often, our first responders are our eyes and ears on the ground.

Q. When did you first realize the importance of interoperable communications to first responders?

A. September 11 made governors across the Nation aware of our responsibility to ensure that first responders can communicate. As a state, we have been fortunate to avoid natural disasters such as Hurricane Katrina, but there is no way to predict when such a major disaster may strike. We must be as prepared as possible.

Q. What type of interoperability challenges do Idaho's first responder's face?

A. The state's emergency communications equipment, including repeater sites, are aging. This affects urban and rural public safety communications reliability. Cities and counties across the state are currently seeking and receiving public safety communications funding without the benefit of overall planning and coordination. Policy and planning must be developed to address these issues.

Additional challenges to interoperability in Idaho come from three different areas: disparate frequency use, topographical challenges, and land ownership.

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IN YOUR OWN WORDS

1401: A Program Whose Time Has Come

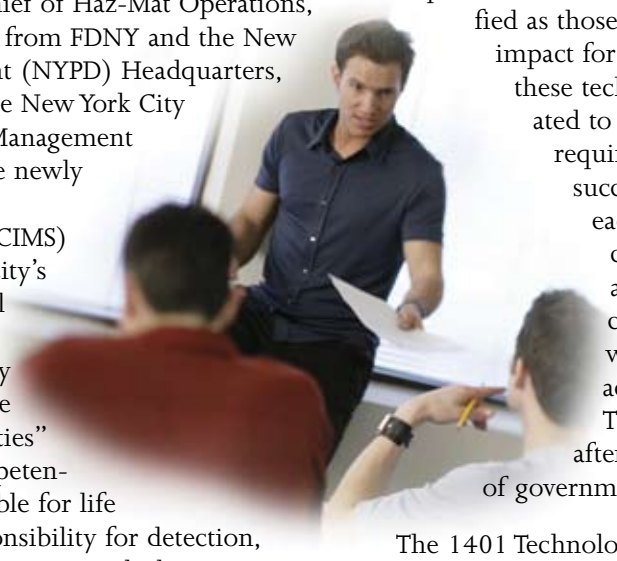
By Battalion Chief Robert J. Ingram and Captain Vincent J. Doherty, FDNY, Haz-Mat Operations

In this article, the authors use a hypothetical scenario to introduce the advantages that HAZMAT units may someday be able to deploy through the 1401 Technology Transfer Program.

It is a clear crisp morning in the future. The temperature is in the high 60s and the sun is shining brightly. I am on the apparatus floor of Haz-Mat 1, the premier hazardous materials (HAZMAT) response and mitigation company of New York City and the Fire Department of New York (FDNY). I am holding rollcall with the members and entering my marks into the company journal, which is basically the log of the firehouse: a day-by-day, hour-by-hour history of events.

The Chiefs Gather

Today is a special day. The members are busy training with and preparing some recently acquired equipment that will raise even higher our capability to detect, identify, and properly mitigate known and unknown HAZMAT releases for a high-level demonstration. Later today, barring any major incident, we will host "the Chief," as we call Robert Ingram, Chief of Haz-Mat Operations, along with staff chiefs from FDNY and the New York Police Department (NYPD) Headquarters, and personnel from the New York City Office of Emergency Management (NYCOEM). Under the newly updated City Incident Management System (CIMS) protocols (New York City's version of the National Incident Management System [NIMS]) all city response agencies share "response responsibilities" within their core competencies. FDNY is responsible for life safety and shares responsibility for detection, identification, and mitigation with the Department of Environmental Protection, whereas the NYPD conducts terrorism scene assessment and crime scene protocols, if and when necessary.



I am the Captain of Haz-Mat 1, the only HAZMAT response unit in the fire service that is 100 percent dedicated to respond to and mitigate HAZMAT incidents. We are the specialists in HAZMAT response for the city because of our advanced training, and we respond to an average 1,000–1,200 natural, accidental, or intentional HAZMAT release incidents a year. Because of this specialty, we are also in the forefront of terrorism response, because, in essence, chemical, biological, and radiological agents are just another "HAZMAT with an attitude."

Expansion Through Technology Transfer

The Chief and I procured cutting-edge technologies for the unit through a new program from the U.S. Department of Defense (DoD) in coordination with other federal departments known as the 1401 Technology Transfer Program. A year ago we were privileged to attend a "coming out event," along with a dozen other practitioners from various disciplines, for three technologies that the U.S. Department of Homeland Security and DoD identified as those most likely to make a positive impact for first responders. Each one of these technologies was adapted or created to fill military, mission-specific requirements and has enjoyed great success. We were asked to evaluate each technology and offer our comments about their viability and usefulness for the response community. Needless to say, we were favorably impressed and acquired them for Haz-Mat 1. They finally arrived this week after great anticipation—the wheels of government move slowly but deliberately.

The 1401 Technology Transfer Program seeks to transfer new technologies to the Nation's emergency responders in an efficient, effective, and consistent manner to improve the preparedness, response, and safety of the responder community. This practitioner-driven approach ensures that technologies selected for transfer meet the needs of the targeted user community.

One of the "toys" we received was a spectrometer using laser-induced breakdown spectroscopy (LIBS) that has both point detection and standoff capability. This instrument is capable of real-time identification and analysis of unknown materials. It requires no sample preparation and comes in various configurations (e.g., packed into a portable case or in a wearable backpack unit that is basically "firefighter proof").

Haz-Mat 1 presently is using three other spectrometers as front-line, down-range, unknown material identifiers. One technology uses a gas chromatograph and a small separation column that fractionates samples in tandem with a mass spectrometer to produce spectra for liquid and gaseous unknowns. The second uses an infrared beam to excite molecules in both solid and liquid samples to produce spectra. The third uses Raman

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Frequency Use

- The state has 170 fire service districts and 60 emergency medical service providers operating on the VHF frequency.
- Idaho has 44 county sheriffs' offices, 88 local police departments, and the Idaho State Police operating on the UHF frequency.
- Tribal governments are operating on both UHF and VHF frequencies.
- Two-thirds of local emergency service providers have interoperability problems within their own jurisdictions, particularly in mutual aid response from surrounding counties.

Topographical Challenges

- One-third of the state is mountainous terrain, causing a multitude of challenges for radio communication.

Land Ownership

- In Idaho, 65 percent of land is federally owned.
- The state has 2.4 million acres of land designated as wilderness areas.
- Private property makes up 20 percent of sites leased by the state, counties, and cities.

Q. Can you describe interoperability-related initiatives that you are currently leading?

A. In 2003, I signed an executive order creating Idaho's Statewide Interoperability Executive Council (SIEC). I asked this council, which is made up of local, state, and federal stakeholders, to provide policy-level direction and promote efficient and effective use of resources for matters related to public safety wireless radio interoperability. The SIEC has proven to be one of the most dynamic and effective councils within state government, primarily because SIEC members are so passionate and dedicated to improving the safety of the citizens of Idaho by ensuring that first responders are able to communicate. Whether it's a car accident on one of Idaho's rural highways, a large-scale forest fire, or a major natural disaster, citizens have an expectation that help is on the way.

Idaho has been fortunate to be one of five states selected to participate in the National Governors Association Interoperability Policy Academy. Through this process, our state has developed a radio interoperability concept entitled I-C-A-WIN (Idaho Cooperative Agencies' Wireless Interoperable Network). From my perspective, this concept is truly a model for the rest of the Nation.

The SIEC has developed the I-C-A-WIN Concept as a first step in the development of a statewide system that will meet the demands of today and take Idaho's emergency communications system into the future. The citizens of our great state expect help to be there when they need it. Radio communication must work for all responders because when a person's life is at stake, the ability to talk may mean the difference between life and death. (More information about the I-C-A-WIN Concept can be found at */www.nga.org/Files/pdf/0508ICAWIN.PDF.*)

Q. What is the value of interoperable communications to Idaho's first responders? To the Nation?

A. On local, regional, and national levels, communications with first responders are critical to assessing the extent of a disaster, whether manmade or natural, and the ability of government to respond to it. Again, we are asking our first responders to be our eyes and ears on the ground. We must give them the tools to do their job, so the rest of government can respond in kind.

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spectrometry, which uses a laser as the power to excite the molecules of solid, liquid, and dissolved solids in liquids. Each has its own value and complements the other.

The addition of LIBS technology extends our capability and freedom to quickly identify materials using minute samples and gives real-time results from down-range operations. The suite of sensors available with this instrument makes biological and explosive real-time identification a reality. The members have been using this instrument all over the firehouse, identifying household cleaning supplies and other chemical concoctions present in the firehouse—some that you may not want to know about. This is real "field" testing!

The next piece of technology, from the U.S. Navy, is a fine-water mist system that atomizes water under low pressure to maximize the surface area of the water. This process allows the firefighter to use less water, which can be very important in HAZMAT applications as well as in reducing property water damage. Also, because a smaller diameter hose is used, it reduces firefighter fatigue. Both our firehouse brother units, Squad 288 and Haz-Mat 1, received a nozzle system and are currently field evaluating the technology, both for fire-ground use and decontamination operations. We have high hopes for this particular piece of technology to reduce our decon "gray water" runoff and for possible use at metal and electrical fires.

The final technology that Haz-Mat 1 and our field communications unit received from the Technology Transfer Program is a multiple technology communications system that operates in a 900-MHz, GPS-denied environment. The system incorporates a wireless communications network, wearable situational awareness sensors, and a mobile command system. This system and parts of it have multiple applications in our line of work. We are anxious to adapt this technology to our in-suit communications procedures, but it is initially intended for, and is excellent in, underground tunnel and subway incidents along with high-rise applications.

Real-Life Field Test

The chiefs and special guests arrive and my firefighters go into high gear, actually using the equipment and demonstrating its many attributes. There are multiple side discussions between the chiefs and others, which I interpret as positive vibrations from the small group. I can see ideas developing. These are the incident commanders that will have to order the deployment of this equipment. In doing so, they need to have a working understanding of its capability so they can coordinate it into their operational tactics.

Suddenly, the inevitable happens. The department radio (which we maintain within ear shot throughout the firehouse, scanning all five boroughs, all the time) increased in chatter on the Manhattan frequency. Our house tone alert sounded. The house watch announced Box 9999, Grand Central Station, 10-60, 10-80. The house watch echoed the box number followed by the words: Haz-Mat 1, squad turnout, everybody goes!

I yell to the members to put everything on the rig, bid the chiefs goodbye with a shrug, and turned toward the rig. Instinctively, scenarios roll through my head. A Manhattan job with squad and Haz-Mat 1 response can't be good. I sensed that it was big, because Squad 288 was assigned on the same box. Rarely do the "Mat" and "the Squad" respond out-of-borough together. My ears tune to the apparatus department radio for further information.

The dispatcher calls Squad 288 over the voice alarm. The chauffeur grabs the voice piece, "Squad 288, K."

"Squad 288," screeches the voice alarm, "respond with the second piece."

"Squad 288, 10-4," responds the chauffeur.

"Squad 288," chirps the voice alarm. "Squad 288, have the Haz-Mat 1 Chief respond and activate his department phone."

"Squad 288, 10-4," replies the chauffeur over the voice box. "Chief, you guys go too, and the dispatcher wants to talk to you over your cell phone."

It takes six to eight minutes for us to arrive in Manhattan, sometimes longer, depending on traffic. During response we accumulate information by monitoring the operations. We had multiple civilian casualties in Grand Central Station. From the reports, first-due units responded to an explosion on level two, the main concourse. Thousands of people pass through this area every minute. This is not good. Reports continue about a noxious cloud migrating through the station as units entered.

Battalion 8 calls for the 10-60, 10-80, and requests multiple ambulances to treat the injured and

exposed. The facts run through my head and I develop possible scenarios and how I will handle them. A tunnel, a wide area, the obvious need for decon, and an unknown that needs to be identified sooner rather than later so that the victims could be properly treated. This is the "perfect storm" of incidents that plays right to our capabilities.

I radio the members in the back. "Did we get all that new 'tech transfer' equipment back on the rig?"

"10-4 Cap, we got it safe and sound," chatters the radio.

I turn my attention to the response and smile. I know my team will be able to handle anything. "Bring it on!"

About the authors: Battalion Chief Robert Ingram is a 24-year veteran of the FDNY, the Chief of HAZMAT Operations, and the Chair of the Interagency Board (IAB) for Equipment Standardization and Interoperability. Captain Vincent Doherty is a 24-year veteran of the FDNY, former Captain of Haz-Mat 1, co-chair of the IAB Science and Technology subgroup, and presently a fellow through the Naval Postgraduate School at the U.S. Department of Homeland Security's Directorate for Preparedness, Office of Grants and Training.

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