Interoperability Technology Today

EMS on the Frontline: Challenges and Communications Needs

The biggest interoperability challenge facing emergency medical services (EMS) today, states Kevin McGinnis, is that EMS agencies are not effectively communicating their interoperability needs to those who need to know—policymakers, local officials, and emergency response partners.

"We spend our lives responding, and we don't take time out to plan our future," says McGinnis, Maine Emergency Medical Services Trauma System Manager and also the Program Adviser specializing in communications technology, data systems, and rural EMS for the National Association of State EMS Directors. "We are not communicating our needs. We are not at the meetings of the state interoperability executive committees, or the statewide coordinating committees, or at regional and local planning meetings. We need to do a better job of getting to the table."

McGinnis, a member of the SAFECOM Executive Committee, says that EMS agencies, like other emergency response groups, face the challenges of ageing equipment, dead zones, and ineffective communications during day-to-day operations and in the wake of disasters. However, EMS agencies also face unique interoperability challenges.

Like firefighters and police officers, EMS responders need to communicate within and across disciplines, but they also need to communicate with hospitals and trauma centers. Many times, EMS personnel drive through multiple jurisdictions that use different radio systems. For example, a hospital with a new 800-MHz system used by the local EMS agency may not have enough personnel to closely monitor VHF radios used by EMS from outlying jurisdictions.

"Unlike any other public safety agency, except perhaps state police, EMS is very far-ranging," McGinnis says. "If there is a mass casualty incident, departments from three or four different areas might be called in. It's important for EMS tactical channels to be established so these folks can communicate with each other and with local hospitals."

Further, McGinnis notes that an EMS unit driving across multiple jurisdictions—rural and urban— may experience one or more "dead zones" where radio systems are completely ineffective.

"For many rural EMS, the real need is just plain operability on a day-to-day basis," he says, adding that in the early 1990s, it seemed that cell phones might offer at least a partial solution to interoperability. However, it was quickly discovered that circuits become jammed in times of crisis, and that cellular service also experiences dead zone issues. As a result, EMS and other emergency response agencies continue to struggle with gaps in coverage, with no easy solution in sight.

Small EMS agencies face additional challenges. Some rural EMS agencies cannot afford to purchase equipment compliant with Project 25 (P25). Yet in some states, agencies need P25-compliance to receive funding. McGinnis says that although P25 compliance has to be encouraged, exceptions should be granted for small rural agencies that do not often interact with other agencies.

"These agencies need to be able to continue to operate with their current equipment," he says.

DMIS Improves Emergency Response Collaboration

Emergency response agencies working to improve the ability to securely exchange emergency-related information with mutual aid partners may find a solution in the Disaster Management (DM) program's DM Interoperability Services (DMIS). The no-cost software toolset enables the emergency management community to securely share digital information. By providing information sharing capabilities, tools, and supporting infrastructures, DMIS helps practitioners better prepare for, respond to, and recover from emergencies and day-to-day operations.

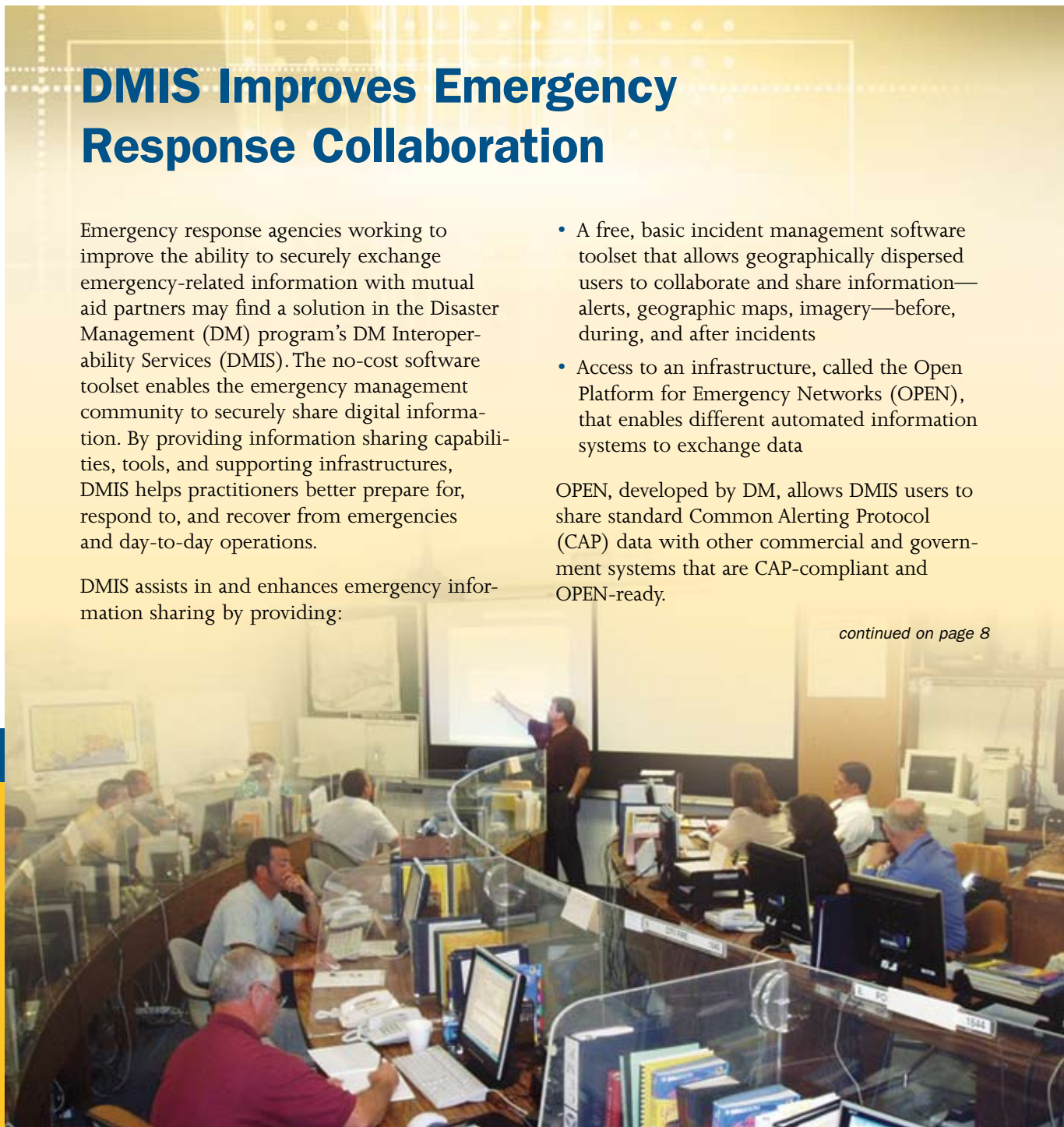DMIS assists in and enhances emergency information sharing by providing:

- A free, basic incident management software toolset that allows geographically dispersed users to collaborate and share information— alerts, geographic maps, imagery—before, during, and after incidents
- Access to an infrastructure, called the Open Platform for Emergency Networks (OPEN), that enables different automated information systems to exchange data

OPEN, developed by DM, allows DMIS users to share standard Common Alerting Protocol (CAP) data with other commercial and government systems that are CAP-compliant and OPEN-ready.

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LEADERSHIP MESSAGE

Baseline Survey Identifies National Interoperability Capacities for Nation's Emergency Responders

By Jay M. Cohen, Under Secretary for Science and Technology

Results are in for the SAFECOM program's National Interoperability Baseline Survey!

Fielded last summer, the survey generated findings that will help emergency responders, policymakers, and SAFECOM make informed decisions about strategies for improving interoperability and target resources to address shortfalls.

Major survey findings include the following:

- About two-thirds of agencies report using interoperability to some degree in their operations.
- Agencies tend to be more developed in technology and some governance-related interoperability areas than they are in standard operating procedures (SOPs) and exercises.
- The smallest agencies tend to be at earlier stages of overall development compared with larger agencies.
- Law enforcement and fire response/emergency medical services (EMS) agencies tend to show the same level of development in most areas of interoperability.
- Cross-discipline and cross-jurisdiction interoperability tend to be at a more advanced stage than state-local interoperability.
- Agencies that operate on large, shared systems tend to be at a more advanced stage of development than those that operate on stand-alone systems.
- Advanced development in approaches, implementation, exercises, command and control, and SOPs correlates to advanced frequency of use and familiarity, that is, how often and in what situations interoperability is used.

To ensure that the sample would provide an accurate picture of interoperability, SAFECOM surveyed 22,400 randomly selected law enforcement, fire response, and EMS agencies nationwide. Conducted between May and July 2006, the online survey was designed to provide a comprehensive assessment of communications interoperability capacity among the Nation's emergency response agencies. The landmark analysis had a response rate of 30 percent. Participation was nearly evenly split between law enforcement and fire response/EMS.

To supplement survey findings and gather qualitative and anecdotal information, researchers also interviewed senior officials in 36 law enforcement and fire response/EMS agencies in 9 regional areas. The survey produced sufficient data to constitute a valid statistical sample, and results can be generalized to emergency responders nationwide.

The Baseline Survey assessed capacities across a wide spectrum of interoperability factors, making it the first interoperability assessment derived from a comprehensive definition of interoperability. The survey was designed in partnership with the emergency response community and founded on the five elements graphically depicted in SAFECOM's Interoperability Continuum—governance, SOPs, technology, training and exercises, and usage of interoperable communications.

Survey questions assessed agencies' stages of development in each of these five areas. For each area, survey questions accounted for three "levels" of interoperability: across disciplines, across jurisdictions, and between agencies of the same discipline across state and local governments.

By providing a clear picture of current interoperability capabilities, the Baseline Survey findings provide emergency response leaders and policymakers with the foundational data needed to evaluate next steps and define future milestones. Strengthening interoperability is part of an ongoing process, not a one-time investment. Partnerships across agencies and government levels will continue to prove critical in maintaining a commitment to progress.

Tools and resources to address many of the gaps highlighted in the Baseline Survey findings are available on the SAFECOM program Web site at www.safecomprogram.gov.

For details on Baseline Survey results, visit the SAFECOM Web site at www.safecomprogram.gov.

SAFECOM would like to acknowledge the more than 6,800 participating emergency response agencies for their time and thoughtful answers to the Baseline Survey. Each response aided SAFECOM in creating a national picture of interoperability.

NACo's First of Four Policy Academies Helps County Leaders Address Interoperability Challenges

This past October, approximately 30 county officials gathered in Baltimore, Maryland, for the National Association of Counties' (NACo) first Policy Academy on Interoperability, held in conjunction with the Mid-Atlantic All Hazards Forum.[*] The two-day academy was the first in a series of training sessions intended to help local officials increase their knowledge and awareness of interoperable communications issues beyond the latest available technologies.

Over the next two years, NACo will use a $1 million grant it received in 2006 from the U.S. Department of Homeland Security (DHS) to offer three additional policy academies, which will be held in 2008. The training events, made possible through a funding agreement with the DHS SAFECOM program, will equip local policymakers with the information to effectively address interoperability challenges.

"Our academies will help officials and professionals at the county level learn how to explain interoperability more effectively to elected officials back home, who often have little understanding of the concept and its associated technical jargon," says Rocky Lopes, NACo Project Manager for Homeland Security.

"We will be examining the dynamics of interoperability beyond the technology—that is, dealing with the issue of governance and building cross-jurisdictional cooperation," Lopes continues. "Since FY 2007 is the DHS 'year of the statewide plan,' we will be looking at ways to encourage a bottom-up approach to interoperability issues. We want to show how county leaders can contribute to the statewide interoperability plan."

NACo's first policy academy drew elected officials from Maryland, North Carolina, Pennsylvania, Virginia, and West Virginia. Participants—including county commissioners and a county council member—shared a background in management and represented a broad base of emergency response expertise. Participants included law enforcement and fire response officers, directors of emergency services, directors of information technology, and managers of radio and 911 systems. For every policy academy, NACo requires that each participating county's delegation include at least one elected official and one to three professionals.

The first day of the training, which coincided with the All Hazards Forum, featured a panel of homeland security directors from six states and the District of Columbia. This opening session focused on the following topics:

- The prospect of limited Federal grant money
- Fusion centers, which are collaborative efforts to combine and analyze antiterrorism information from multiple sources
- Protection of ports and critical infrastructure
- Interoperability in regards to data sharing
- The necessity of establishing strong local and regional relationships

"Establishing truly interoperable communications among law enforcement, fire departments, emergency medical services, and other emergency responders involves people, processes, and technology—but especially people," says Dennis R. Schrader, Maryland's Homeland Security Director. "Engaging both county and state officials, as we did at the conference in Baltimore, is the right way to approach interoperability. No group can go it alone and succeed."

Three 90-minute training sessions rounded out the first day. The sessions afforded county officials an opportunity to learn about data-sharing initiatives in the mid-Atlantic region, common-language initiatives in voice communication, and Federal interoperability efforts and their application at the local level.

The second day featured the policy academy presentations. Presenters drew upon first-hand experience to provide participants with information about interoperability dynamics, governance, training, statewide interoperability planning, funding strategies, and current legislation.

In his statewide interoperability planning discussion, Virginia Interoperability Coordinator Chris Essid stressed the value of creating a position that is focused solely on statewide interoperability planning and housed in the governor's office. According to Essid, this type of position enables the assigned individual to gain a "big picture" perspective on a state's interoperability, to appreciate a state's diverse conditions, and to serve as an interoperability advocate who is unaligned with a specific discipline or locality.

Major Dean Hairston, who oversees grant writing for the Danville Police Department in Virginia, delivered what amounted to a crash course on securing grants. County officials learned about best practices for writing grant applications—at times, a locality's only means of acquiring equipment specified in an interoperability plan.

In addition to lessons learned from presenters like Essid and Hairston, the policy academy allowed participants to network and build relationships.

"The most telling comment for me," says Montgomery County Council Member Marilyn Praisner, who attended both as a presenter and participant, "came from a county elected official who said that if he had not come to the conference, he would never have known about the concerns his public safety officials had regarding the state's plan for interoperability. His comment also reinforced for me that most often it is not the technology but the collaborative process that is the greatest challenge."

Praisner says that the first academy was a good first step. "Because it was organized in conjunction with the All Hazards Forum, [the academy] had to fit [its] format and was limited in size and geography. We will build on what we learned from this one. Hopefully, future academies will give more elected officials and practitioners the tools to ask the right questions, will provide opportunities to share knowledge and experience, and will create new champions of collaboration and interoperability."

For More Information

For more information about NACo, visit *www.naco.org*. As details become available, information about future policy academies can be found on the NACo County Resource Center Homeland Security Web page at *www.naco.org/Template.cfm?Section=New_Technical_Assistance&Template=/TaggedPageTaggedPageDisplay.cfm&TPLID=62&ContentID=14040*. Using grant funds, NACo covers travel, housing, meals, and registration expenses for participants. Participants must be from NACo member counties.

[*]The Mid-Atlantic All Hazards Forum is a public-private partnership of mid-Atlantic states and private corporations. It is designed to improve regional homeland security and emergency management by assisting communication among its members.

Statewide Interoperability Planning Workshop

To support progress in statewide planning for communications interoperability, the FY 2006 Homeland Security Grant Program requires that states develop and adopt statewide interoperability plans by the end of 2007. To ensure all states include essential components in their plans, the SAFECOM program in fall 2006 provided formal criteria for the plans.

To help states incorporate the criteria, the National Governors Association's Center for Best Practices (NGA Center), SAFECOM, and the National Public Safety Telecommunications Council have partnered to host a statewide planning workshop. The workshop will be held March 21–23, 2007, in Los Angeles, California.

"The purpose of the workshop is to bring the state teams together so they have an opportunity to receive technical assistance on how to incorporate the criteria into their plans," says Erin Lee, Program Director for the NGA Center's Homeland Security and Technology Division.

The workshop is an invitation-only event. Governors' offices in all 50 states and all U.S. territories

P25 Compliance Assessment Program: An Overview

By Dereck Orr, Program Manager for Public Safety Communications at the National Institute of Standards and Technology, Office of Law Enforcement Standards

In recent years, the prospects of Project 25, commonly known as P25, have been clouded by reports that communications equipment presumed to be compliant with established standards did not fully meet specified requirements. Tests conducted on behalf of the U.S. Department of Commerce's National Institute of Standards and Technology (NIST), equipment deficiencies listed by the Department of the Interior's Technical Service Center, and other such evaluations identified interoperability problems. These reports were intended to motivate companies to resolve interoperability problems, but instead, they served mainly to highlight them.

Professionals in both government and industry concluded that reporting discrepancies was not an adequate mechanism for advancing P25 objectives. After studying the situation, Congress agreed and passed legislation calling for a compliance assessment program and directing that all equipment purchased with Federal grants must meet the program's requirements. Accordingly, the P25 Steering Committee requested in April 2005 that SAFECOM and its technical partner, the NIST Office of Law Enforcement Standards, begin to develop the P25 Compliance Assessment Program.

The central purpose of the program is to help emergency response officials make informed purchasing decisions. By consulting reports published on a SAFECOM-selected Web site, officials will know which products meet available standards and are indeed interoperable; each piece of equipment will have run the gauntlet of an established testing regime developed under the oversight of NIST. This compliance testing initiative should remove the majority of concerns expressed by the emergency response community.

For more than a year, NIST has engaged in high-level discussions with P25 vendors and equipment users in order to construct a framework for the program. An unprecedented level of cooperation has emerged within the Telecommunications Industry Association's TR8 Committee, which is charged with developing P25 compliance assessment standards. The development of a testing baseline was the major hurdle and was key to establishing a robust testing procedure. In the past, the development of formal test procedures was a low priority for many vendors, but today,

the community is diligently engaged in drafting 10 interoperability, conformance, and performance test documents for the four P25 interfaces identified as most critical by SAFECOM: Common Air Interface, Inter-RF Subsystem Interface, Fixed Station Subsystem Interface, and Console Subsystem Interface.

Vision Behind the Program

Project 25 was launched in 1989 to develop standards that define how digital land mobile radio systems should operate and how key system interface standards would allow radios and other components to interoperate regardless of manufacturer. The ultimate goal of P25 is to specify formal standards for the following eight interfaces between the various components of a land mobile radio system:

- Common Air Interface
- Inter-RF Subsystem Interface
- Fixed Station Subsystem Interface
- Console Subsystem Interface
- Network Management Interface
- Data Network Interface
- Subscriber Data Peripheral Interface
- Telephone Interconnect Interface

The vision behind the P25 Compliance Assessment Program is that only compliant equipment will be marketed as such. To move toward this vision, the program has three parts: a supplier declaration of compliance (SDoC), a summary test report, and a records and inspection provision. The SDoC is a formal manufacturer certification of product compliance that provides details about product configuration and lists the types of tests applied to the product. Two very important features are the test results that substantiate compliance and the signature of a responsible company official.

The summary test report contains more details about the tests listed in the SDoC and presents this information in a uniform, easy-to-review format. For example, it grades each test as passed or failed.

Eventually, SDoCs and summary test reports will cover the three key elements of compliance:

- **Interoperability**—Functional, "can-you-hear-me-now" testing
- **Conformance**—Bit-by-bit, message-by-message protocol verification
- **Performance**—Measurements that verify specifications for a component or subsystem

Regarding the records and inspection provision, manufacturers are required to maintain all records of the test results, and these will be open to inspection by members of a peer assessment panel composed of competing P25 vendors and NIST representatives. Achieving the compliance assessment vision in full will take years, but NIST expects to begin implementing aspects of the program in early 2007.
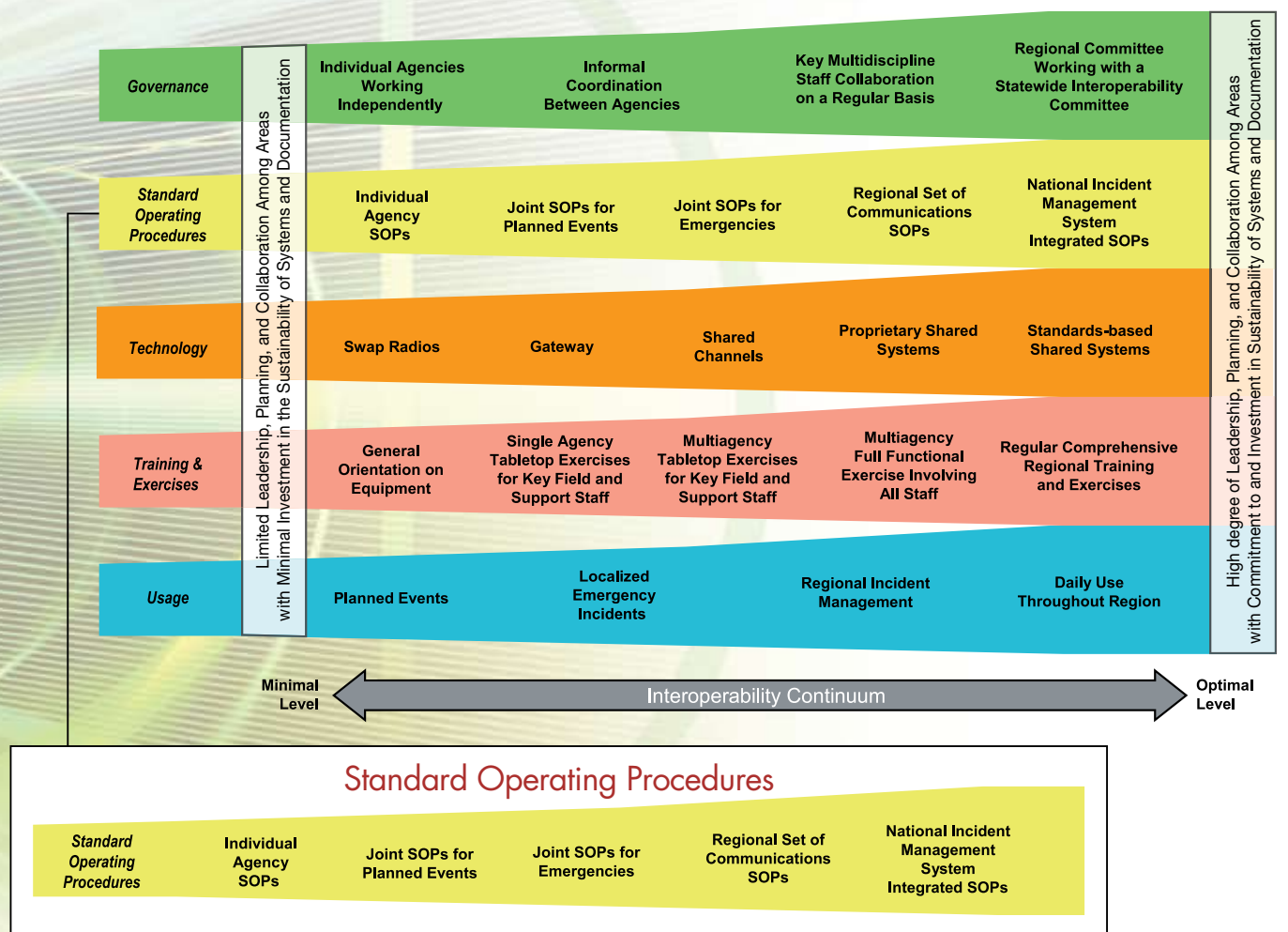
Getting Under Way

Initially, NIST proposed that compliance testing be conducted by third-party, accredited laboratories; however, P25 vendors made compelling arguments for a more flexible and responsive first-party approach. P25 vendors wanted the option of conducting their own tests and were prepared to give competing manufacturers access to their systems to conduct tests. They were also prepared to submit to peer assessment and monitoring.

The P25 Compliance Assessment Program as now designed reflects this vendor-suggested approach. It allows manufacturers to develop their compliance programs much more rapidly by avoiding the need to train employees of third-party laboratories. Other advantages are more rapid product development and lower costs—both of which are to the advantage of emergency responders. The program will benefit the emergency response community because it challenges the manufacturing community with compliance verification and because competition should result in affordable subscriber equipment.

NIST and manufacturers will launch the program by testing trunked radio equipment for interoperability on the Common Air Interface. (Trunked systems use a

Interoperability Continuum

		Minimal Level ← → Optimal Level				
Governance	Limited Leadership, Planning, and Collaboration Among Areas with Minimal Investment in the Sustainability of Systems and Documentation	Individual Agencies Working Independently	Informal Coordination Between Agencies		Key Multidiscipline Staff Collaboration on a Regular Basis	Regional Committee Working with a Statewide Interoperability Committee	High degree of Leadership, Planning, and Collaboration Among Areas with Commitment to and Investment in Sustainability of Systems and Documentation
Standard Operating Procedures		Individual Agency SOPs	Joint SOPs for Planned Events	Joint SOPs for Emergencies	Regional Set of Communications SOPs	National Incident Management System Integrated SOPs	
Technology		Swap Radios	Gateway	Shared Channels	Proprietary Shared Systems	Standards-based Shared Systems	
Training & Exercises		General Orientation on Equipment	Single Agency Tabletop Exercises for Key Field and Support Staff	Multiagency Tabletop Exercises for Key Field and Support Staff	Multiagency Full Functional Exercise Involving All Staff	Regular Comprehensive Regional Training and Exercises	
Usage		Planned Events	Localized Emergency Incidents		Regional Incident Management	Daily Use Throughout Region	

Minimal Level ◄─────── Interoperability Continuum ───────► Optimal Level

Standard Operating Procedures

Standard Operating Procedures	Individual Agency SOPs	Joint SOPs for Planned Events	Joint SOPs for Emergencies	Regional Set of Communications SOPs	National Incident Management System Integrated SOPs

pool of channels for many separate groups of users.) Compliance testing will involve both infrastructure and subscriber units (portable and mobile radios). The summary report for a trunked infrastructure will give details about the subscriber units tested against it, and the summary report for each subscriber unit will give details about the trunked systems and subscriber units tested against it. As manufacturers test more combinations of products, they will update their SDoCs and summary test reports; they will also update these documents as they complete compliance testing for conformance and performance. This testing and updating process will apply to products built in accord with the other interfaces.

Throughout the early stages of the Compliance Assessment Program, NIST and vendors expect there to be growing pains. P25 standards and the related test procedures will evolve to cover new equipment and improved systems. From time to time, both standards and procedures will have to be modified to resolve problems stemming from inconsistent interpretations. Of course, many standards and test procedures have yet to be developed. Another reality is that radio systems of the past were primarily hardware-only products, but systems today depend on both hardware and software components. Consequently, legacy equipment and software upgrades, which can cause problems for smoothly functioning interoperable communications systems if not perfectly compatible with all equipment in the system, will pose a continuing challenge.

To cope expeditiously with the inevitable growing pains, NIST will continuously seek feedback from industry representatives and others and will employ this feedback to sharpen both testing procedures and the standards themselves.

Notable Programmatic Points

All parties—government officials, vendors, technicians, purchasing agents, and equipment users—ought to understand what the program is and is not. Participation by manufacturers is strictly voluntary. They are free to develop, market, and sell P25 products without testing for compliance. The Department of Homeland Security, however, will restrict (aside from a few special considerations) its grants for purchasing equipment to products that pass the tests of the program and appear on its published list.

This is not a certification program; that designation is customarily reserved for compliance assessment programs that employ third-party, accredited laboratories. For participating manufacturers, it is important to note that their most detailed test reports and anything proprietary may remain confidential. Only facts and data documenting compliance must be released.

Lastly, the program is not to be seen as a foolproof mechanism—no compliance program can be—or a panacea guaranteeing universal interoperability. The program is, however, a critical step toward achieving far greater interoperability, and its first stages have already brought about improvements.

In 2007, SAFECOM plans to begin publishing suppliers' declarations and summary test reports on the Responder Knowledge Base site (*www.rkb.mipt.org*), which has been operating for years. For authorized purchasers and emergency response professionals, this site will serve as a one-stop-shop repository for valuable information about both P25-compliant products and the P25 Compliance Assessment Program.

For More Information

For more information, visit the "Technology Solutions & Standards" subsection of the "Library" section of *www.safecomprogram.gov/SAFECOM*. The chapter on compliance assessment in the "SAFECOM Inaugural Industry Summit Report" (March 2006) may be helpful.

and the Mayor of the District of Columbia received letters notifying them of the workshop and asking them to designate representatives to attend.

States are already working to develop plans that meet statewide interoperability needs. The workshop will complement this work by providing a forum for state teams to receive additional guidance and to learn best practices.

"While some states already have interoperability plans," Lee says, "in this workshop they will work toward refining them against the criteria. They have been actively working on this issue because it is a priority for emergency communications."

Criteria

SAFECOM, in cooperation with local and state practitioners who provided input, has compiled and published criteria that will assist states in developing a comprehensive statewide plan. The criteria, which are included in SAFECOM's updated grant guidance, recommend a practitioner-driven approach involving local, tribal, state, and Federal stakeholders. The use of a practitioner-driven approach in a statewide strategic planning process ensures the inclusion of the perspectives of all emergency responders in the plan. In addition, this approach ensures that states have comprehensive strategies for improving interoperability that take into account end-user needs.

SAFECOM recommends applying its Interoperability Continuum as a comprehensive framework to address critical elements for planning and implementing interoperability solutions. The Continuum graphically depicts five critical interoperability success factors—governance, standard operating procedures (SOPs), technology, training and exercises, and usage of interoperable communications.

The guidance document includes a comprehensive list of criteria for states to use during plan development. Criteria are organized by 10 major components of a statewide interoperability plan: background and preliminary steps, strategy, methodology, governance, technology, SOPs, training and exercises, usage, funding, and implementation. Highlights include the following:

- Use an all-inclusive approach that involves local, tribal, state, and Federal agencies. List all agencies that participated in development of the plan, including the governor's office, state and local health offices, law enforcement, fire response services, state transportation agencies, and military organizations operating in the state.
- Identify the point of contact. The Department of Homeland Security expects that each state will have a full-time interoperability coordinator.
- Describe the strategic vision, goals, and objectives for improving statewide interagency wireless communications for emergency response.
- Provide an overview of the governance structure that will oversee development and

implementation of the plan. Illustrate how it represents all of the relevant emergency response disciplines and regions in the state.

- Include a statewide capabilities assessment, or a plan for one, of the communications equipment available and related issues.
- Describe plans for continuing support of legacy systems and developing interfaces among disparate systems while migrating to newer technologies.
- Include an assessment of current local, regional, and state operating procedures that support interoperability.
- Describe the plan for ensuring regular use of relevant equipment and the SOPs needed to improve interoperability.
- Define the process by which the state will develop, manage, maintain, and upgrade—or coordinate as appropriate—a statewide training and exercise program.
- Include a plan for the development of a comprehensive funding strategy.

NGA Policy Academies

The March workshop is not the only interoperability plan assistance available to states.

NGA is hosting 10 policy academies in 10 different states, beginning with Alabama, Indiana, Minnesota, Montana, and Washington. To support governors and other state and local policymakers in developing statewide interoperability plans, the NGA Center, in partnership with SAFECOM, awarded $50,000 to these states in July 2006. The awards are part of a 12-month policy academy program under which statewide teams participate in planning-related meetings and receive assistance tailored to their particular needs. The first five states have until July 2007 to complete their work.

Representatives of the five states met for the first time November 28–30, 2006, in Indianapolis. They will come together again early in the summer of 2007 to share their accomplishments, best practices, and lessons learned. In addition to working with their own teams, participants are able to consult through the academies with other state teams and experts.

"We invite state and local practitioners who have knowledge of the interoperability process—they are a resource to the statewide teams," Lee says. "At the academy, we have a collection of representatives from a variety of disciplines and levels of government."

The NGA Center uses an action planning process to help states develop their plans. In addition, NGA Center staff conducted site visits prior to the November meeting to prepare participants for the policy academies.

The $50,000 is used for plan-related activities such as meeting attendance and paying for resources to develop a plan (e.g., salaries, printing costs).

For detailed information on interoperability plans and criteria, visit *www.safecomprogram. gov/SAFECOM/*.
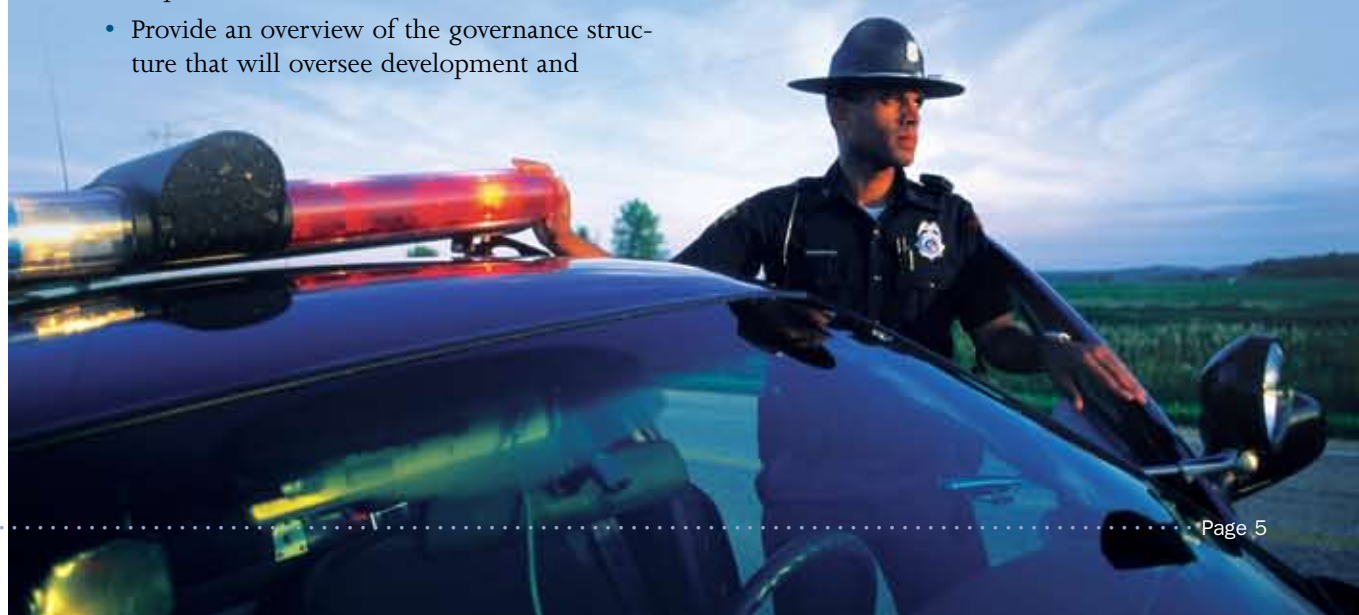
"Some small volunteer units may do only a few hundred calls a year. They rely on pagers or handheld radios for their volunteers, and they cannot afford to pay thousands for P25-compliant units. They need to purchase $400 handheld radios, so they can afford to buy 10, not 2."

The relatively new field of Software Defined Radio (SDR) may help EMS agencies address some of the discipline's interoperability challenges. SDR uses software to convert digital signals to analog, analog to digital, and one frequency to another.

"We need to have a multimodel SDR in the back of the unit, instead of carrying a VHF radio, a UHF radio, a cell phone, and maybe other units as well," McGinnis says. "We need to just be able to dial in that we need the hospital, and let it pick the right channel."

McGinnis adds that a communication system that uses software to modulate and demodulate various radio signals is an example of a future interoperability solution. Still, progress in interoperability will take more than new technologies. It will be important for EMS to "get to the table" to communicate the discipline's needs.

Taking the High Ground in New Orleans

When Hurricane Katrina devastated New Orleans' communications infrastructure—its antennas, generators, radio towers—the question for local responders was less about interoperability than it was about being able to operate at all. Today, New Orleans is working to ensure that this infrastructure will remain operational and reliable if the city faces another disaster of Hurricane Katrina's proportions.

According to Colonel F.G. Dowden, Regional Liaison for the New Orleans Department of Homeland Security and Public Safety and lead for the region's interoperability plan, backup generators and fuel supplies for emergency communications buildings are being elevated above the flood plain, and new towers are now designed to withstand 150-mph winds.

The region's interoperability plan also addresses radio systems. In November 2006, the New Orleans metropolitan area began using a dual mode, 700-MHz/800-MHz, Project 25-compliant, digital-trunked system. The new system replaced more than 50 different radio systems.

"After Hurricane Katrina, the three public safety agencies (police, fire, and emergency medical services (EMS)) in the City of New Orleans couldn't talk to each other," Dowden says, adding that the new system was in development before Katrina, but the storm provided the impetus to use Federal grant dollars to make the single shared regional radio system a reality.

With the new infrastructure and radio system in place, EMS should never again have to resort to using runners and face-to-face conversations to convey messages—communications methods frequently used during the Katrina response and recovery. Matthew Kallmyer, Medical Liaison/ Planner for the city's Office of Homeland Security, recalls that downed communication networks forced police and EMS to establish a command post from which they dispatched runners to relay messages, while responders continued trying to locate a radio signal.

Operable communications returned to portions of the area when, a couple of days after the storm,

generator power was finally restored to antennas on the top of the Energy Centre. The city's fragile communications chain gained some more strength when members of the 82nd Airborne Division erected a network of antennas to provide for their unit's communications.

Katrina also damaged the city's cellular infrastructure, although Kallmyer says using cell phones for backup communication was never part of the city's plan. Although emergency services agencies discovered that cell phones could still communicate via point-to-point text messaging, the technology was not an adequate replacement for EMS communications.

"At that time, the [medical] director [of New Orleans EMS], Dr. Jullette Saussy, had the only BlackBerry® in the EMS agency," Kallmyer recalls. "Now, all the administrative staff, field supervisors, and the special operations director have them as well, so we'll be better prepared if we ever face another 'Doomsday Scenario'."

Katrina's aftermath also made New Orleans officials keenly aware that interoperability is more than a citywide, regionwide, or statewide problem.

"We had assistance coming in from other areas, and they all came in with different communications equipment. We need . . . something that will require equipment made by different manufacturers to be compatible, and we also need to establish a national mutual aid channel," Kallmyer says.

"If you buy a toy that needs batteries, it takes a standard size, and it doesn't matter which manufacturer makes it; if it needs a 'D' battery, everyone's 'D' battery will work," he adds. "If you look in a radio catalog, there are pages and pages of just batteries. We just don't have time to deal with that. If my battery goes dead, someone else ought to be able to loan me theirs. We're not advocating that everyone be required to buy the same radios, just that manufacturers should be required to make radios more compatible."
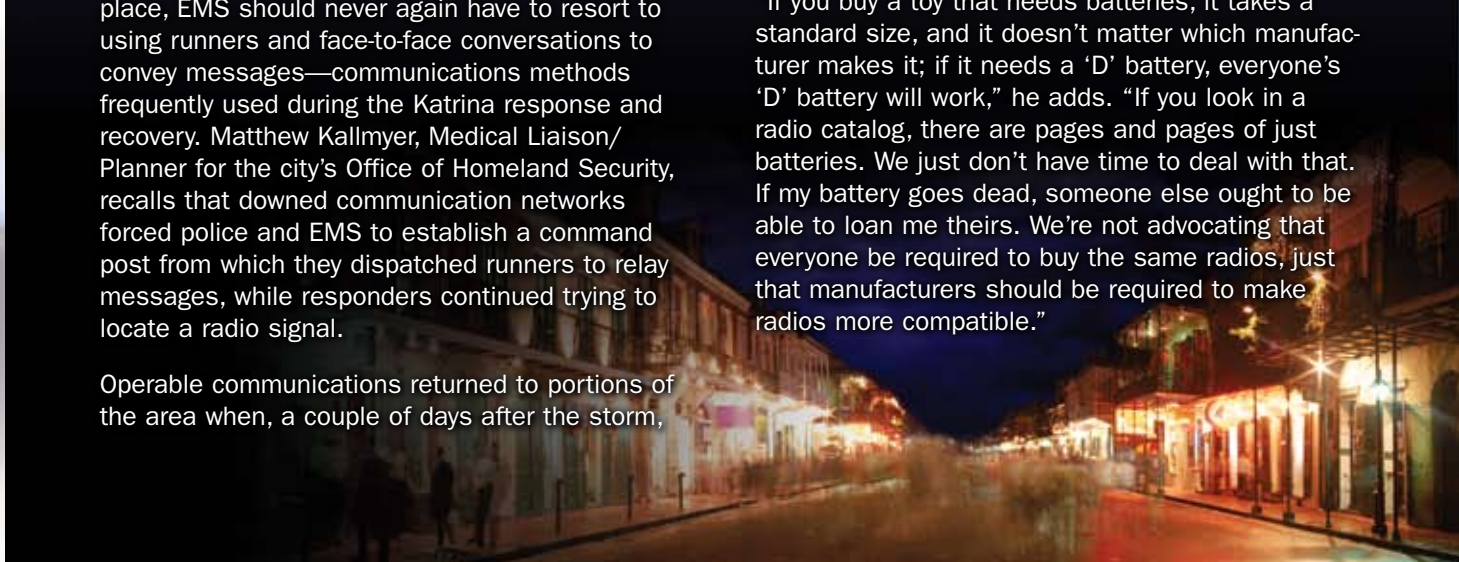
Disaster Management Elects New Chairman for Practitioner Steering Group

Timothy Loewenstein was recently elected Chairman of the Disaster Management (DM) program's Practitioner Steering Group (PSG). In keeping with DM's practitioner-driven approach, the PSG was established to ensure that DM initiatives and tools effectively meet the information sharing priorities and requirements of emergency responders. The group's 14 member associations represent key DM stakeholders, including emergency responders, health and highway officials, governors, and mayors.

Loewenstein, who will guide the group's activities for the next two years, is an elected member of the Buffalo County (Nebraska) Board of Supervisors and Chairman of the county's law, technology, and homeland security committees. While serving on the steering committee of the National Coordination Committee of the Federal Communications Commission, he recommended standards in both the technology and deployment of the public safety interoperable bands reserved in the 700-MHz spectrum. Loewenstein is active in the National Association of Counties, currently Chairman of its Information Technology Committee. He attended the Elkins Institute in Dallas, Texas, Nebraska's York College, and the University of Kansas Medical School.

Minnesota Grapples With "No Easy Answers"

"As you improve systems, you can sometimes create more interoperability issues," says Mary Hedges, Executive Director of the Emergency Medical Services Regulatory Board for Minnesota. Her state is in the process of slowly building out a statewide 800-MHz system, and as the initial concept expanded from state Department of Transportation trucks and the Highway Patrol to all emergency services agencies, and from the Twin Cities Metro area into the rural parts of Minnesota, those interoperability issues become more and more apparent.

"There just aren't any easy answers," she says. "Every improvement has its associated costs and drawbacks." Hedges became head of the state agency that licenses ambulance services and emergency medical services (EMS) personnel nine years ago. With a background in state government, not EMS, Hedges faced a steep interoperability learning curve. She was soon well-versed in the challenges of meeting the interoperability needs of EMS agencies that serve the state's urban areas—half of Minnesota's population is concentrated in seven counties near Minneapolis and St. Paul—and those that serve the state's rural communities.

The opinions of agencies on Minnesota's 800-MHz system seem to vary by geography. Hedges says that metropolitan agencies using the 800-MHz system praise its quality of transmission and the solid coverage it provides when the necessary infrastructure exists. For maximum coverage, the system requires a large number of towers. This presents a challenge for rural areas, which require even more towers than urban areas because of rugged and varied terrain. Hedges says many municipalities cannot afford the cost of building these towers, and that residents perceive the towers as spoiling the landscape. In addition, an 800-MHz system does not support service for pagers—the communications backbone of many volunteer agencies, on which rural areas may depend.

"Making [the 800-MHz system] operational statewide will be a gargantuan project," Hedges says. The "backbone" already exists in the Twin Cities area, and the state has also expanded [it] southeast toward Rochester, home of the Mayo Clinic, and west to St. Cloud. Law enforcement and fire service agencies are beginning to come online in those areas, but EMS organizations as of now have not.

"I think the EMS providers in those areas are still trying to figure out how it will work," Hedges adds. "If they begin to use it, how will they talk to hospitals and each other outside the 800-MHz area?" Hedges explains that, in Minnesota as elsewhere in the Nation, EMS agencies routinely provide transportation and other services outside their "home base" areas. For example, the nearest trauma center may be several counties away, or EMS may need to call for helicopter transport from an isolated region. "And as we go into the more rural areas, people get very emotional about switching. They are concerned about the extreme cost of converting, especially if they already have a good operating system that they have worked hard to perfect."

Until now, Minnesota has relied on user fees to fund the 800-MHz system in metropolitan areas, but for many rural agencies, such a funding method simply is not financially feasible. According to consultants hired by the state, Minnesota will need to fund more of the system's costs if the system is to become truly statewide.

Hedges' office will continue to grapple with these challenges—including the need for additional frequencies for use in disasters—as it revises the state's 10-year-old EMS radio communications plan. One aspect of that plan divides the state into regions and assigns specific frequencies to the hospitals and agencies serving the eight EMS regions. Putting the 800-MHz matter into the mix further complicates that process.

"People here are talking a lot about interoperability and, even more importantly, just plain operability," Hedges says. "I have no great insight into the problem. I only know there are certainly no easy answers."

To address these concerns among EMS providers, Hedges' office has been conducting regional meetings on communications concerns with EMS providers throughout the state. She is encouraging the EMS community to form regional radio boards that will develop their plans for interoperability across disciplines, and to plan for changes if and when 800 MHz goes statewide. In addition, she has become a member of an operations committee of the recently formed Statewide Radio Board to ensure that EMS interests are taken into account as the system is built out.

Q&A With Tim Loewenstein

Q. In your view, what are today's major challenges in disaster management and interoperability?

A. On the surface, "disaster management" seems easy enough to define. A casual observer would say that when a tragedy occurs, someone should be able to manage the mitigation of the damage. But the truth is that disaster management is successful only when you have a cohesive effort from one of the most diverse group of interests imaginable—from the Humane Society to the health department, the fire department, law enforcement, and even the antiterrorist task force. Because of this diversity, attempts to mitigate a disaster of any size can succeed only if there is a common denominator among all of the responders.

We live in the computer age. Typewriters, calculators, slide rules—these are all things of the past. But computers have come to be designed to talk to one another. And this does not always mean that the message sent is the message received. When the message sent is "fire," to the fire department that means one thing, to law enforcement it means something entirely different.

Q. What is the role of the Practitioner Steering Group in addressing these challenges?

A. The Practitioner Steering Group can bring together the brightest representatives from each interest in a diverse group of responders. Sitting around a table, egos checked at the door, they [members] have the unique opportunity—and challenge—to develop the tools that allow the message to mean the same thing to the sender and the recipient. The steering group has already demonstrated its ability to share, to learn, to debate, and to choose the path that brings the greatest benefit for America's citizens.

The idea of the members checking their egos at the door is important. What has been the real obstacle to a true exchange of information? I suggest that the answer to that question doesn't have to do with technology exclusively. We have scientists and computer geniuses who can make anything happen. The answer has to do with people. What the steering group is accomplishing is truly the model for interoperability. That is the networking of diverse people who come together with one common goal: to arrive at a solution that allows for the exchange of information between diverse groups so that the content means the same thing to the sender and the recipient.

Q. How did you become interested in interoperability issues? What lessons have you learned since becoming involved in the field?

A. Since my early teens, I have enjoyed participating in the hobby of amateur radio. When the era of VHF repeaters came along, I was one of the early adopters. We operators began to ask each other, why can't we tie these different frequencies together? If we "interoperate," then we could talk over much greater distances. That is when the concept of interoperability began to fascinate me. Then it developed as a hobby into operating between VHF and HF in data transmissions that reach halfway around the world—and realizing that the only real barrier to achieving anything we can imagine was people. I quickly found hams who often used "we" in our conversations, but unfortunately I also found those who much preferred the letter "I."

From ham radio to disaster management to public safety (health, fire, and law enforcement), the fascination with interoperability has been a constant. We should be able to intercommunicate when we need to. The odd thing is that even though a good number of years has passed since my first observation about "we" and "I," it still seems to be true: the barrier to interoperability is people.

Q. If you were not doing this type of work, what would you be doing?

A. I have enjoyed a wonderful life, with the opportunity of having been educated in three very diverse fields: divinity, engineering, and medicine. If I were not doing what I am doing today, I would probably struggle to decide between medicine and teaching. Medicine would truly allow me to touch people's lives and, I would hope, feel at the end of the day that each of those people perceived life as a little more pleasant. Teaching, however, would offer the challenge and opportunity of sharing my observations and experience with others and finding those cherished few who can look outside the box, see the big picture, and become far greater advocates for "we" than for "me."

"DMIS tools are a great way for 'have not' communities to get started in collaborative computing for emergency response," says Chip Hines, DM Program Manager. "The basic tool suite is free to emergency management organizations. The tools are basic, and do not compete with the more sophisticated tools available in the private sector."

The user-friendly software suite incorporates drop-down menus that promote quick completion of tasks, and uses geographic information system technology in its mapping function, Hines says. Other tools include a weather report feature, a journal feature, and preformatted reports.

Earlier this year, the U.S. Navy began rolling out DMIS to all installations and regions in the continental United States. DM is helping the U.S. Navy and surrounding local communities install and train in DMIS. As a result, many jurisdictions in coastal Mississippi are also benefiting from the Navy DMIS rollout.

Bob Strahan, Emergency Management Director in Pearl River County, Mississippi, has adopted DMIS in his community. Strahan says he has found DMIS very user-friendly and easy to learn. "I don't think your typical computer user would have a bit of trouble using it. The symbols, the directions—they're just great. They really help you scoot around in it."

Strahan learned about DMIS in June 2006, when he took a class in neighboring Harrison County. He instantly caught on to its value and arranged for DMIS training for his own county in early September 2006.

"It has a lot of useful tools that really meet my needs as well as other needs within the agency," Strahan says. "The mapping feature is particularly useful." Strahan hopes that local law enforcement in his area will soon join emergency services in using DMIS, because he feels that this would improve knowledge of day-to-day operations and eliminate duplicate efforts. He would also like to develop a "network" with other neighboring counties that could be activated in an emergency.

"For example," Strahan says, "there might be coastal flooding, and those counties might be short of shelters. They could contact us for assistance. We also have a peak tornado season in the fall in addition to the potential for hurricanes in the summer, and while we hope we don't have to use it for a big event, it would be great if we were all ready for one."

Although DMIS is not a tracking system per se, Strahan has come up with a way to use it to track supplies and the status of orders. "If I order something, I can put it down, go back later, pull the request, and see what the status is," he says.

Kimberly Prentice of the Ocean Springs Fire Department in Mississippi is another new user who sees a lot of potential in DMIS. Her department's chief, who also serves as civil defense director, assigned Prentice to take one of the online tutorials in August 2006.

"I really liked it," Prentice says. "It seems very user-friendly. I liked that we could do the training right from our own computers." Other Ocean Springs personnel have since taken the training based on her recommendation. Prentice says that the fact that DMIS is free was an attractive point, although initially she wondered, "If it's free, how good can it be?"

"We looked it over and found it to be really complete. It's obvious that somebody really sat down and thought about the needs of the people who would be using it," she says.

Ocean Springs suffered some severe damage during Hurricane Katrina, including destruction of the Biloxi Bay Bridge. Although Prentice is glad that the city did not have to deal with any major hurricanes in 2006, she says that if Ocean Springs does face another major event from the weather, from a railroad incident, or even from earthquakes, DMIS will help responders manage it more efficiently.

The DMIS software toolset is available on the DMIS Web site at *www.cmi-services.org*.
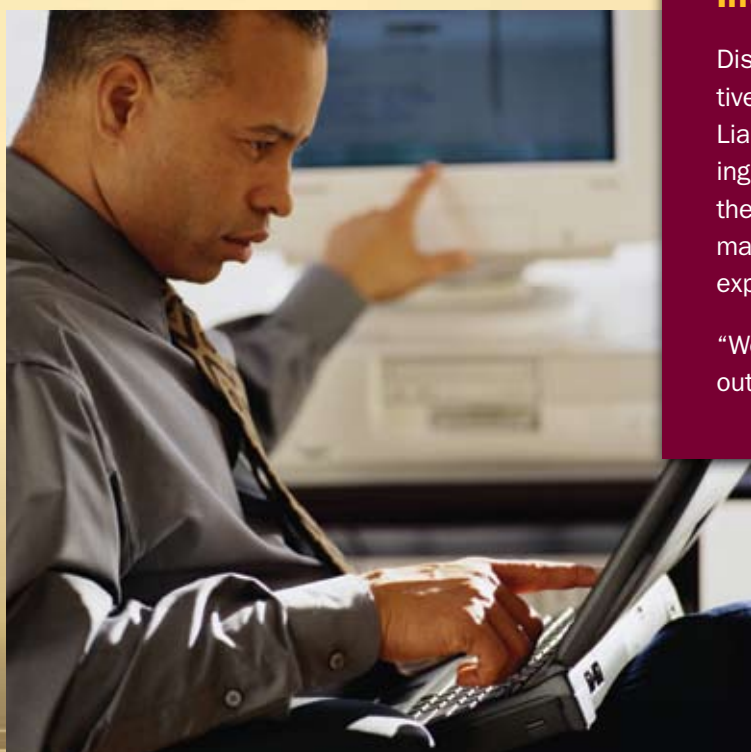
Interested in DMIS training?

Disaster Management Interoperability Services (DMIS) presently has more than 1,800 collaborative operating groups throughout the Nation, including at least one in every state. DMIS Responder Liaison Scott Eyestone estimates that 200 to 300 agencies regularly use the toolset, while remaining agencies are still learning about the benefits of DMIS. The majority of DMIS training employs the Internet through online tutorials and exercise scenarios. However, Eyestone and his staff will make arrangements for online Live Meeting events and onsite training if an agency or agencies expresses a strong enough interest and can gather enough participants for such a session.

"We only have six trainers to train all of the country," Eyestone says. "Therefore, large-scale rollouts such as the Navy's require a train-the-trainer approach."

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