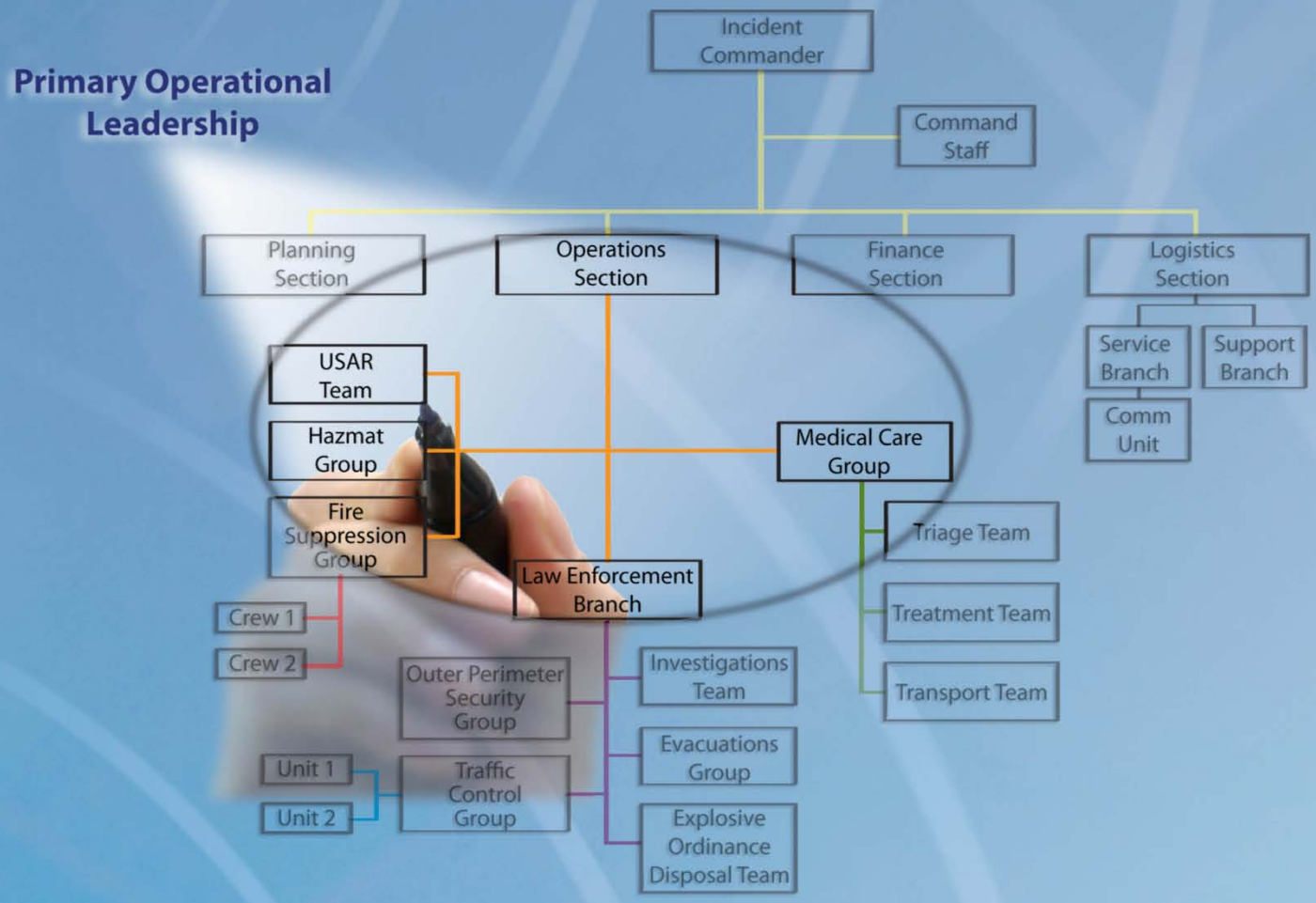

National Emergency Communications Plan:

Urban Area Communications Key Findings and Recommendations

2011

Homeland Security

Homeland Security

Message from the Director

I am pleased to announce the achievement of Goal 1 of the National Emergency Communications Plan (NECP). The U.S. Department of Homeland Security's (DHS) Office of Emergency Communications (OEC), within the National Protection and Programs Directorate's Office of Cybersecurity and Communications, developed the NECP in coordination with representatives from major public safety organizations to help build capabilities and measure performance for emergency communications across all levels of government.

NECP Goal 1 focused on emergency communications in the Urban Areas Security Initiative (UASI) regions and was an important step in the Department's ongoing efforts to assess progress and improve interoperable emergency communications across the Nation. To measure NECP Goal 1, OEC worked with the Nation's UASI regions to assess their ability to demonstrate response-level emergency communications during a planned event chosen by each region. This approach provided the best opportunity for evaluating emergency communications in real-world settings and in an economically efficient manner.

Based on the NECP Goal 1 assessments, OEC concluded that all participating UASI regions were able to demonstrate response-level emergency communications to varying degrees and have instituted the necessary capabilities to achieve interoperability among multiple agencies and jurisdictions during large-scale planned events. This success is in part a result of the measurable advances in regional governance groups and regular training and exercises in these regions since DHS issued its Urban Area Tactical Communications assessments in 2007. Communications-specific exercises, which were infrequently held in the past, were found to have been used in almost every UASI region since the publication of the NECP.

As part of the NECP Goal 1 process, OEC worked closely with representatives from the state and local community to establish performance measurement criteria that can provide ongoing benefits to jurisdictions beyond just demonstrating this Goal. OEC is using the same criteria to assess NECP Goal 2 and is encouraging public safety agencies in urban, suburban, and rural jurisdictions to continue to focus on the key elements of response-level emergency communications in their future planning, operating procedures, training, and exercises.

The NECP Goal results are providing OEC and DHS with valuable information to better target our supporting resources, such as technical assistance offerings, training, and planning efforts. Implementing interoperable emergency communications nationwide is a complex process, and OEC remains committed to improving emergency responders' communications capabilities and achieving the vision of the NECP: ***Emergency responders can communicate as needed, on demand, and as authorized; at all levels of government and across all disciplines.***

Chris Essid, Director
Office of Emergency Communications

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Executive Summary

OEC developed the NECP in coordination with more than 150 representatives of the public safety community at all levels of government. This includes the SAFECOM Executive Committee/Emergency Response Council (EC/ERC) and the National Public Safety Telecommunications Council (NPSTC), which are composed of major public safety associations. Since its release, the NECP has driven improvements in key areas identified by the public safety community as critical to emergency responder communications, including planning, governance, operating procedures, and training for responders. In addition to these priority areas, the NECP also established performance benchmarks[1] for measuring public safety agencies' ability to demonstrate response-level emergency communications through the three NECP Goals:

- ***Goal 1:*** *By 2010, 90 percent of all high-risk urban areas designated within the UASI can demonstrate response-level emergency communications within one hour for routine events involving multiple jurisdictions and agencies.*
- ***Goal 2:*** *By 2011, 75 percent of non-UASI jurisdictions can demonstrate response-level emergency communications within one hour for routine events involving multiple jurisdictions and agencies.*
- ***Goal 3:*** *By 2013, 75 percent of all jurisdictions can demonstrate response-level emergency communications within three hours of a significant event, as outlined in the department's national planning scenarios.*

To measure NECP Goal 1, OEC worked with 60 urban areas—as defined by the Department's Fiscal Year (FY) 2008 UASI regions—to assess their ability to demonstrate response-level emergency communications during a routine event. The NECP defines response-level communications as the capacity of individuals with primary operational leadership responsibility to manage resources and make timely decisions during an incident.[2] The events observed by OEC included large public gatherings that required participation from multiple public safety agencies and jurisdictions to be managed under the National Incident Management System (NIMS). In carrying out these assessments, OEC specifically looked at the following components of response-level emergency communications:

- ***Common Policies and Procedures:*** Shared policies and procedures should exist to allow interagency communications to occur in a consistent and structured manner during the event. The policies should be designed to avoid confusion, improve operational effectiveness, and increase the safety of responders and citizens.
- ***Responder Roles and Responsibilities:*** The responsibilities of responders should be clearly established and maintained during the event. Specifically, observers evaluated whether NIMS Incident Command System (ICS) principles of chain and unity of command, unified command (for multi-agency incidents), and a managed span of control were principles being fulfilled.

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[1] *The Implementing the Recommendations of the 9/11 Commission Act of 2007* required that OEC set a date in the NECP, including interim benchmarks, for when public safety agencies expect to achieve a baseline level of national interoperable communications.

[2] Department of Homeland Security, *National Emergency Communications Plan*, p. 6.

- ***Communications System Quality and Continuity:*** Land mobile radio and related public safety communications systems should ensure that high quality communications are in place throughout the event for command and control of responding personnel, including if and when primary systems experience failures or disruptions.

Based on the capabilities documented at each event in these three components, all 60 UASI regions demonstrated response-level emergency communications to varying degrees in accordance with NECP Goal 1. The demonstrations illustrate how the significant organizational and technical investments made by the UASI regions have improved their emergency communications capabilities in recent years. Primary radio systems effectively supported NECP Goal 1 event responses, and additional voice and data systems provided redundancy and increased situational awareness.

While the evaluations of the individual events cannot be used to predict the UASI regions' overall communications under all conditions, the NECP Goal 1 results show that the Nation's largest cities have instituted the capabilities needed to achieve response-level emergency communications during large-scale planned events involving multiple agencies and jurisdictions.

The completion of these assessments represents an important step toward achieving national interoperability; however, significant work remains. The UASI region events demonstrated that despite an existing culture of cooperation among law enforcement, fire, and emergency medical services and other disciplines, coordination across these disciplines is not fully integrated into event planning or consistently carried out. Evaluators noted that event planning and execution approaches that were segmented by discipline raised concerns about the ability of UASI regions to achieve similar success during a large-scale emergency incident, where the incident site is not known and responders' are facing larger requirements for coordination.

OEC will focus on these cross-disciplinary communications issues in future assessments, including NECP Goals 2 and 3, and will use the results to better target resources such as training, technical assistance, stakeholder coordination, and planning.

Figure 1 - Key Findings of NECP Goal 1

Common Policies and Procedures
Plain Language: Agencies are generally utilizing plain language during multi-agency responses as called for in NIMS and included in most UASI Tactical Interoperable Communications Plans. **Incident Action Plans (IAP):** A significant number of UASIs developed and utilized IAPs that included Incident Radio Communications Plans, but many UASIs developed multiple IAPs that were segmented by discipline and inconsistent with one another.
Responder Roles and Responsibilities
Communications Unit Leader: Trained Communications Unit Leaders supported communications at almost all events; however, operational leadership did not always effectively utilize the position to help plan or manage the response. **Operations Section Chief:** Several UASIs utilized multiple Operations Section Chiefs, a practice which runs counter to NIMS. UASIs often segmented this position by discipline and did not always coordinate effectively.
Communications System Quality and Continuity
Primary and Redundant Systems: Radio systems successfully supported all events and UASIs are using advanced data technologies for communications redundancy, as well as overall situational awareness. **Inter-Disciplinary Talk Paths:** Primary operational leadership often used face-to-face interaction and cellular phones to execute cross-discipline communications.

Introduction

OEC was established to promote emergency responders' ability to continue to communicate in the event of natural disasters, acts of terrorism, or other man-made disasters and work to ensure, accelerate, and attain interoperable and operable emergency communications nationwide. As part of this mission, OEC completed a comprehensive nationwide planning effort with more than 150 emergency response stakeholders and published the NECP[3] in 2008.

The NECP serves as the first national strategy for interoperability and provides a roadmap for public safety personnel and government officials to make measurable improvements in emergency communications related to coordination, governance, planning, usage, training, exercises, and technology. OEC worked with emergency responders to develop performance-based goals and criteria for measuring interoperable emergency communications. The three NECP Goals are documented below:

Goal 1: By 2010, 90 percent of all high-risk urban areas designated within the Urban Areas Security Initiative (UASI) are able to demonstrate response-level emergency communications within one hour for routine events involving multiple jurisdictions and agencies.

Goal 2: By 2011, 75 percent of non-UASI jurisdictions are able to demonstrate response-level emergency communications within one hour for routine events involving multiple jurisdictions and agencies.

Goal 3: By 2013, 75 percent of all jurisdictions are able to demonstrate response- level emergency communications within three hours for a significant event as outlined in national planning scenarios.

Document Scope

This report documents the nationwide results of assessing response-level emergency communications for NECP Goal 1, which is focused on the FY 2008 designated UASI regions (Figure 2). This report presents aggregate findings of the observations and summarizes the key recommendations that OEC has provided to the UASI regions to maintain and improve their emergency communication capabilities. These findings and recommendations are intended to support the plans and programs of state and local governments to improve emergency communications during multi-jurisdictional and multi-disciplinary emergency operations.

Figure 2: FY 2008 UASI Regions

[3] NECP, July 2008, http://www.dhs.gov/xlibrary/assets/national_emergency_communications_plan.pdf

Approach and Methodology

OEC used a two-pronged approach to assess communications in the Nation's UASI regions, as depicted in Figure 3. The observations of planned events provided a snapshot of a UASI region's ability to demonstrate response-level emergency communications at one point in time. To further assess the broader environment in which these events were held, OEC asked each UASI region to evaluate and report on its overall interoperable emergency communications capabilities. OEC based the capability questions on the lanes of the SAFECOM Interoperability Continuum (see Appendix A for a complete listing of the capability options) and Chapter 2 of the NECP,[4] which identifies the key foundational capabilities needed for effective emergency communications. OEC directed the UASI regions to assess their capabilities and coordinate the results with their respective Statewide Interoperability Coordinators for inclusion in their Statewide Communications Interoperability Plans (SCIPs) before submitting them to OEC.

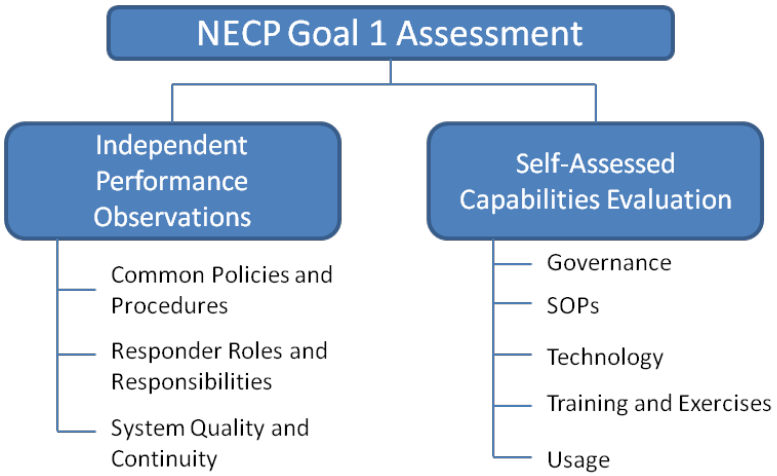

Figure 3: Two-pronged Assessment Approach

For the NECP Goal 1 performance observations, the UASI regions selected large-scale planned events that occurred within their region and required public safety support from multiple agencies, disciplines, and jurisdictions. The type of events included large sporting events, conventions, parades, marathons, and large public events, including several July 4th celebrations. In total, more than 1,000 Federal, state, and local agencies participated in the 60 NECP Goal 1 events.

OEC observation teams evaluated each UASI region's performance against standard criteria for establishing response-level emergency communications at these events (see Appendix C for a listing of NECP Goal 1 evaluation criteria). Each OEC team included a lead observer, a member of the OEC Federal staff, and two public safety peers who volunteered to serve as observers. All observers received specialized training to prepare them for the observations and, when possible and where they existed, the assessments included Communications Unit Leaders (COMLs) on the observation teams.

[4] NECP, pp. 7-8.

In accordance with NECP Goal 1, the observation teams assessed each UASI region's ability to achieve response-level emergency communications, which incorporates the critical elements of command, control, and communications within an incident response. The NECP defines response-level emergency communications as the capacity of primary operational leadership to exchange information related to resource management and operations without significant technical or procedural barriers. Figure 4 illustrates the critical role that primary operational leadership plays in connecting the incident leadership with responders in the field.

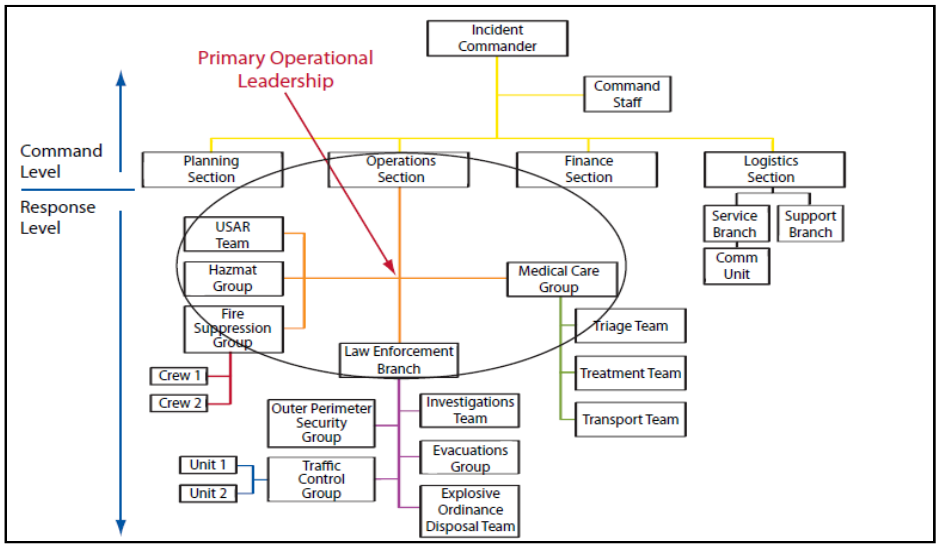

Figure 4: Primary Operational Leadership

The fundamental elements required for effective response-level emergency communications are present in both crises and planned responses. These elements include common policies and procedures, responder roles and responsibilities, and the quality and continuity of communications systems as defined as:

- ***Common Policies and Procedures:*** Jointly developed policies and procedures can provide a clear, structured way to establish inter-agency communications during an incident. This approach can improve operational performance and safety for both the public and emergency response personnel. Generally, observers looked for strong implementation of IAP and each UASI region Tactical Interoperability Communications Plan (TICP).[5]
- ***Responder Roles and Responsibilities:*** Familiar, consistent, and clearly defined functional command roles during emergencies support response-level emergency communications among agencies. DHS promotes the National Incident Management System (NIMS) as the framework for collaborative crisis and emergency management nationwide. Within emergency management operations, the elements and processes of command, control, and

[5] Each urban area that received FY 2005 UASI Grant Program funding was required to develop a TICP. Most UASI regions established after 2005 have developed TICPs.

communications are tightly coupled. To evaluate response-level emergency communications during planned events, the NECP Goal observations focused on responder roles and responsibilities as implemented and performed within the Incident Command System (ICS) command structure.

- ***Communications System Quality and Continuity:*** Federal, state, and local agencies have communicated by radio for nearly a century and are significantly invested in systems used for emergency response. Land Mobile Radio (LMR) is the primary wireless communication medium for emergency services. NECP Goal observers evaluated the quality, reliability, and usability of public safety LMR systems used during the event observations, as well as the UASI region's plans for establishing backup communications in the event of a system failure.

Following each event observation, the observation team developed an After Action Report and a site-specific improvement plan that was shared with each UASI region and their respective SWIC. Observers summarized their observations and provided recommendations for future improvements specific to planned events in the regions. Each UASI region received an overall finding aligning their response-level emergency communications capability with one of four levels (advanced, established, early, or not demonstrated) as described in Appendix B. Every UASI region demonstrated this Goal to a varying degree.

NECP Goal 1 – Levels of Demonstration

As explained in the previous section, OEC teams of subject-matter experts and public safety peer observers assessed communications at a pre-planned event within each UASI region. Observation teams were guided by standard criteria used to assess the UASI regions' performance against the objectives of NECP Goal 1. More than half of the UASI regions demonstrated an **Advanced** level of response-level emergency communications in their event, indicating the presence of strong planning and effective command and control (Appendix B provides a general explanation for each level of demonstration). Also, more than a third of the UASI regions demonstrated NECP Goal 1 at an **Established** level, indicating that they faced minimal difficulties relating to policies and procedures, command and control, or communications equipment.

Based on these results, OEC is providing specialized training and support to address gaps identified during the Goal 1 events and the capabilities assessment reports.[6] OEC has offered the UASI regions two-day workshops that address the nationwide findings and lessons learned from the NECP Goal 1 observation process and a second day of training with the topic(s) to be determined by the host UASI region officials.

The remainder of this report documents the key findings for each NECP Goal 1 observational element—common policies and procedures; responder roles and responsibilities' and the quality and continuity of communications—and relevant capability data as reported to OEC by the UASI regions.

[6] This information was included in each State's SCIP Implementation Report.

Key Findings – Common Policies and Procedures

To assess this aspect of response-level emergency communications, observers generally looked for strong implementation of standard operating procedures (SOPs), event-specific IAP, and the UASI region's TICP, which documents the resources and operational procedures needed to implement interoperable emergency communications within urban areas. In general, a TICP details agreements among agencies for joint communications governance structures, technology configurations, and usage policies and procedures, including the use of plain language for interoperable emergency communications. The NECP Goal 1 assessments produced findings that were unique to each UASI region's use and implementation of policies and procedures. In addition, two major findings—specifically the use of plain language and an IAP—are relevant nationwide.

The UASI regions implemented shared policies, practices, and organizational structures during the planned events and used plain language for joint communications to achieve NECP Goal 1. Observers also noted some inconsistencies regarding the use and implementation of event policies and procedures, and noted that many of the TICPs did not appear to have been regularly updated since the Department issued its tactical communications assessment in 2007. Finally, evaluators expressed some concern about the ability of emergency services to address larger crises or emergencies in UASI regions that did not operate from a single unified plan.

Common Policies and Procedures
Key Finding: Plain Language

Agencies are generally using plain language during multi-agency responses as called for in NIMS and included in most UASI regions' TICPs.

Observation: NIMS requires that all written and spoken emergency communications during an incident take place in plain, not coded, language – with the exception of some special operations. This approach ensures information disseminated across disparate agencies and disciplines is clearly understood by intended recipients. While coded language (e.g., 10-codes) originated in an effort to protect public safety personnel and the community at large, it can sometimes be an obstacle to shared understanding and operational effectiveness in joint operations as agencies move toward higher levels of interoperability. As a general guideline, operational codes should not be used and acronyms should be avoided during operations involving multiple organizations.

Observers generally found that agencies participating in the UASI region events used plain language for interoperable emergency communications among commanders; a procedure that was documented through their TICPs. At some events, personnel provided reminders about the use of plain language prior to and during the event, and some agencies included plain language reminders in pre-event briefings. Observers did note some situations in which responders used discipline- and agency-specific coded language, but did not note any instances where those coded substitutions significantly impacted operations.

General Recommendations:

- Public safety agencies should continue implementing common policies and procedures; including regular joint planning, exercises, and use of plain language and standardized common talk groups and channels.
- UASI regions should keep their TICPs current and usable, as well as implement and exercise procedural agreements, to establish planning and procedural coherence among public safety agencies in the UASI regions. The use of plain language and other standard operating procedures may increase and improve overall coordination during emergency responses.

Common Policies and Procedures
Key Finding: IAPs

In many cases the event agencies had developed multiple IAPs that were segmented by discipline and not consistent with one another.

Observation: Formal governance structures for interoperable emergency communications can help UASI regions build relationships among participating localities and agencies and improve overall decision-making. Strong governance can facilitate the development of operating procedures and planning mechanisms that establish and communicate priorities, objectives, strategies, and tactics during response operations.[7] This includes the development and use of IAPs,[8] which can drive a consistent, coordinated effort to meet planned objectives and coordinate all responder actions under one joint-agency strategy. Without an IAP, the use of informal, unwritten procedures can sometimes increase the risks of inefficiency during a crisis response or large events.

For the NECP Goal 1 events, almost all UASI regions used written IAPs, and most included a written Incident Radio Communications Plan within their IAP.[9] Based on the capability reports, all UASI regions additionally reported having established formal governance structures for emergency communications activities. Most UASI regions reported having established SOPs for interoperable emergency communications in the region, with a majority of the UASI regions reporting that they are working toward use of common SOPs by all agencies during multi-jurisdictional events; however these efforts are still evolving in some cases. However, observers noted that several sites operated from multiple, independently developed and executed plans that were usually separated by discipline. These plans sometimes showed inconsistencies.

[7] National Incident Management System National Standard Curriculum Training Development Guidance http://www.fema.gov/pdf/nims/nims_training_development.pdf

[8] Some UASI regions referred to these as Event Action Plans. The Term "Incident Action Plan" is used throughout this report.

[9] NIMS ICS Form 205; http://training.fema.gov/EMIWeb/IS/ICSResource/Forms.htm

General Recommendations:

- UASI regions should implement standardized NIMS ICS planning and command practices for multi-disciplinary operations, integrating multiple plans into a single IAP using standard NIMS forms. This approach effectively aligns all participants to one shared set of incident objectives and can reduce the risk of miscommunication that impairs command and control or degrades operational effectiveness.
- UASI regions use their TICPs to develop Incident Response Communication Plans (IRCP), which are more commonly known as ICS 205 forms. The TICP can provide a valuable, reliable, and common starting point for avoiding system conflicts and identifying available communication talk paths. Using the TICP as a source document when building an event IRCP can also improve planning efficiency.

Key Findings – Responder Roles and Responsibilities

The NECP recognizes that the elements and processes of command, control, and communications are tightly coupled within emergency management operations. The command structures formed to implement operations are complex combinations of people and plans. DHS adopted NIMS as the framework to provide a common template for collaborative crisis and emergency management nationwide.

During the NECP Goal 1 demonstrations, observers assessed the implementation and performance of responder roles and responsibilities utilizing the ICS command structure. This included the Operations Section Chief, who plays a key role in facilitating the exchange of information among agencies and across disciplines, and the COML, who is responsible for establishing and maintaining communications interoperability for responding agencies.

In general, observers found that multidiscipline collaboration was demonstrated well in most UASI regions, but not all of them implemented standard NIMS ICS components. In some cases, regions diverged from NIMS by assigning multiple Operations Section Chiefs. In addition, most UASI regions successfully integrated the COML position into planned multi-agency operations, although in some instances, it did not appear that operational leadership maximized the full potential of the position during the response.

The increased use of communications-focused exercises in recent years has been critical to progress in developing greater understanding of responder roles and responsibilities. Almost all UASI regions reported that agencies within their regions are now holding communications-specific exercises, and about half of them reported that the agencies are holding exercises on a regular schedule.

- This Goal 1 finding represents significant progress over similar results from the DHS Tactical Interoperable Communications Scorecard Report, which assessed the maturity of tactical interoperable communications capabilities in 75 urban/metropolitan areas.
- On the issue of exercises, the 2007 TICP report found that “almost no [UASI] region had completed a communications-focused exercise before the TICP validation exercise, which

meant that the areas had no specific practice using their interoperable communications capabilities."[10]

Responder Roles and Responsibilities
Key Finding: COML

Trained COMLs supported communications at almost all events; however, operational leadership did not always effectively utilize the full potential of this position to help plan and manage the response.

Observation: Public safety radio systems are configured for reliable, effective, and secure communications. Poorly implemented connections to other systems can impair or disable critical resources and increase risks to people and property in an emergency. Knowledgeable, skilled individuals are often needed to conduct the necessary planning to reliably and effectively build and link communications talk paths for multi-agency operations. Trained COMLs, in particular, can offer strong general knowledge of radio technology and practical use. Their experience and knowledge of the locality can help maximize communications capabilities at multi-agency events.

During the NECP Goal 1 events, 58 UASI regions assigned DHS-trained COMLs to the responsibility of planning and implementing multi-system communications. The Department's formal COML training class (developed in part as a response to the gaps identified in the 2007 DHS TICP Scorecards) effectively prepared COMLs to plan, implement, and maintain successful joint communications links and overcome unexpected technical problems. For some events, pre-event briefings contained detailed information related to COML duties and guides that helped prepare all users for the event, including who to go to if any communications difficulties arose in the field.

Despite the widespread use of COMLs at these events, in some cases, the COML was assigned other significant duties that did not allow him or her to perform the COML role appropriately. For example, NECP Goal 1 observation teams noted instances where:

- COML skills were underused during events in which the Incident Commander was not familiar with the position and did not effectively integrate it into event planning and execution.
- The COML role was spread among multiple individuals for the event.

General Recommendations:

- UASI regions should continue using DHS-trained All Hazard COMLs and further integrate these COMLs into event planning and operations. Well-trained, qualified, and experienced COMLs can serve as highly effective resources during the planning phase of an event and can bring significant expertise to the event operations.

[10] DHS *Tactical Interoperable Communications Scorecard Report*, January 2007, p.iii.

- Public safety agencies should designate a COML and define responsibilities of the Communications Unit in the pre-event planning process.

Responder Roles and Responsibilities
Key Finding: Operations Section Chief

A significant number of UASI regions utilized multiple Operations Section Chiefs, which does not conform to NIMS. In these instances, the role of the Operations Section Chief was most commonly segmented by discipline.

Observation: The Operations Section Chief plays a pivotal role in facilitating command efficiency and effectiveness during emergency operations. In addition to managing tactical activities, this position is also critical for facilitating the exchange of information and communications among agencies and across disciplines. Many of the NECP Goal 1 events operated with multiple Operations Section Chiefs, often segmented by discipline. In addition, command personnel from different disciplines and agencies generally exchanged information face-to-face, and this type of communications primarily occurred at the Incident Command Post.

In some cases, event planners did not designate an Operations Section Chief for the event, which created operational complexity. Without a single, designated Operations Section Chief, all information flowed in and out of a command post along agency-specific information lines. This approach increased the number of conversations needed to share information across disciplines and therefore increased the risk of misunderstanding. Multiple Operations Section Chiefs and IAPs were observed in some cases, which complicated efforts at coordination.

General Recommendation:

- UASI regions should continue to work to implement standardized NIMS ICS practices and positions in all multi-jurisdictional and multi-agency operations, including NIMS requirements for the Operations Section Chief.

Key Findings – Communications System Quality and Continuity

LMR is the primary wireless communication medium for emergency services across the Nation. The quality, reliability, and usability of public safety LMR systems play a vital role in achieving effective emergency operations. For example, LMR allows all authorized users to monitor broadcasts on a defined channel or talk group, while most current cellular systems do not provide that feature. Emergency responders transmitting information over an LMR command net can be heard by all authorized subscribers, quickly delivering information to those who need it. Perhaps most significantly, only emergency services personnel can access a closed LMR system, while public networks are open to a carrier's entire customer base in the area. Also, during an emergency or times of high call volume, commercial networks can quickly become overloaded while public safety networks remain operational.

The NECP recognizes that state and local agencies have communicated by LMR for nearly a century and are significantly invested in these radio systems for communications during routine and emergency response. The NECP emphasizes the need for agencies to maintain communications in the event of damage to or destruction of their systems and recommends that agencies "identify procedures used to trigger and implement backup communications solutions if primary systems and solutions should become unavailable."[11]

During the NECP Goal 1 demonstrations, OEC observers documented two major nationwide findings for system quality and continuity related to the ability of a UASI region to respond and recover from system failures. First, resources used by emergency services to provide voice radio communications generally performed well nationwide. The few sites that experienced difficulty or a failure of a primary interoperable emergency communications connection had backup systems immediately on hand and maintained continuity of operations.

Second, observers expressed concern about the widespread use of commercial technologies by operational leadership, rather than establishing command talk paths over public safety radio systems that would support wide-area communications with deployed resources. Observers noted that maintaining a coordinated command structure through face-to-face communications would be impractical if command personnel were spread across a wide geographic area. They encouraged responders to provide for the establishment of a command channel and redundant command talk paths using public safety-grade systems to reduce any risks of disruption.

Communications System Quality and Continuity
Key Finding: Primary and Redundant Systems

Radio systems successfully supported communications during all events, and many agencies in the UASI regions are using data technologies for communications redundancy as well as overall situational awareness.

Observation: LMR systems are the primary method for transmitting mission-critical voice communications among public safety personnel and emergency response agencies. Responders rely on analog, digital, conventional, and trunked LMR technologies to provide push-to-talk voice communications with sub-second call setup times, high levels of call completion, and geographic coverage and availability. An increasing number of agencies are also using mobile and fixed data services to improve situational awareness, assist with in-field reporting, and to support strategic and administrative functions during responses.

During the NECP Goal 1 demonstrations, almost all of the UASI regions successfully implemented interoperable emergency communications on LMR systems in their jurisdictions, often through the coordinated use of multiple radio systems. Most UASI regions had specific alternative or backup communications

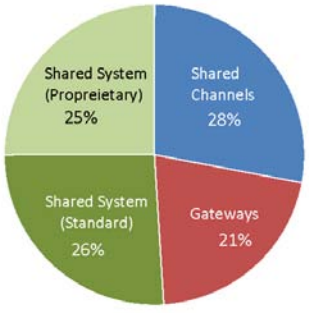

Figure 5 –
Primary Interoperability Method

[11] NECP, Page 22.

pathways identified in their IAPs. In the few instances when a primary system experienced a failure, alternatives and backup connectivity were available and operations were not disrupted. In many cases, incident leaders used commercial communications technology—mainly cellular telephones—in addition to their primary LMR systems.

According to the UASI regions' capability reports, more than 75 percent of the UASI regions are using shared channels or systems as their primary means of interoperability, which simplifies multi-agency communications. Also as shown in Figure 5, 26 percent reported implementing and using Project 25 (P25) standards-based systems, which are designed to allow interoperability regardless of equipment vendor. The implementation of P25 systems has been a key focus of DHS grant guidance in recent years, including the joint DHS and Department of Commerce Public Safety Interoperable Communications (PSIC) grant program started in 2007.

In addition, more than a quarter of the UASI regions indicated in their capability assessments that responders use cellular phones during most or all of their public safety responses, and overall the UASI regions reported using cellular technologies almost 60 percent of the time on average during responses. However, this finding does not indicate that responders are using cellular technology as their primary communications method or in the place of their LMR systems, and OEC observation teams addressed this issue with the UASI regions given that commercial services can be unreliable methods for communications during large-scale incidents.

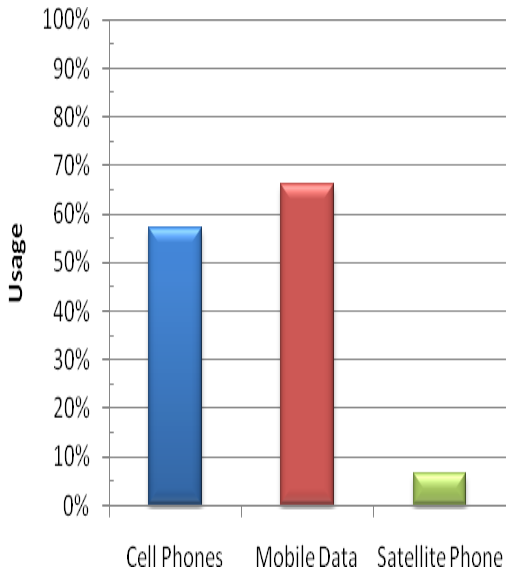

Figure 6: Average UASI Responses Using Non-LMR Technologies

In addition to the use of LMR and cellular technologies, the NECP Goal 1 evaluations noted the widespread use of mobile data—both low-speed private networks and commercial broadband technology—to support command and control applications at NECP Goal 1 events. As reported in their SCIP Implementation Reports, public safety agencies in UASI regions use mobile data in more than 65 percent of responses on average.

NECP Goal 1 observers noted that mobile data systems, including computer-aided dispatch, incident command software, helicopter video downlink, Web-based patient tracking, geographic information systems mapping software, and social-networking sites, were heavily used for situational awareness in a number of the events. These landline and wireless methods of data communications increased the common operating picture for command staff and provided an additional means of communications should their primary systems be disrupted.

General Recommendations:

- Public safety agencies should continue to implement and improve their technical system backup capabilities, including (where possible) the ability to communicate on different systems that are not subject to common points of failure.

- Agencies should work to improve awareness of and the ability to use backup communications effectively through thorough planning and information sharing among all public safety personnel.
- Agencies should continue to integrate mobile data applications into their response plans, including considerations of the potential unavailability of these systems during a major disaster.

Common Policies and Procedures
Key Finding: Inter-Disciplinary Talk Paths

Use of face-to-face interactions and commercial technologies for cross-disciplinary communications at the primary operational leadership level should be accompanied by identified public safety-grade redundancies in preparation for the possibility that command personnel become geographically separated. Mission critical LMR communications must be identified and documented to ensure an effective backup if face-to-face communications are not possible at the primary operational site.

Observation: Face-to-face interaction is one of the most reliable and effective forms of communications during incident response, particularly at the incident leadership level. It is commonplace for multiple disciplines to establish a Unified Command by co-locating personnel and sharing oversight responsibility through face-to-face communications. During most NECP Goal 1 demonstrations, Command Staff were generally assigned LMR talk paths as designated in the IRCP, or ICS Form 205. In addition, the Command Staff used additional methods to coordinate such as face-to-face interaction and commercial technologies and networks. While these non-LMR approaches proved effective during most events, in a limited number of instances, command staff seemed unaware of their assigned LMR talk path when it became necessary to use that path.

The use of mission-critical talk paths is necessary to prepare for unplanned problems during events, including the overloading of commercial technologies or the physical separation of co-located command personnel. Furthermore, while commercial technologies can be an additional means to augment communications, these methods lack the security, flexibility, and reliability necessary to serve as primary emergency services talk paths in critical operations.

General Recommendation: Event leadership should prepare for the possibility that face-to-face communications and cellular technologies may not be available during a significant incident or large-scale disaster. To address this contingency, mission critical communications talk paths should be available and documented in the IRCP, and event leadership should be familiar with the assignments.

Conclusion

The terrorist attacks of 9/11 illustrated the need for national interoperability, and significant improvements have been made over the past several years toward that objective. Marked progress has been made on several issues first identified in the 2007 TICP scorecards, and as the Goal 1 study shows, the Department of Homeland Security and its partners have accomplished a good deal in a short period. More than 85 percent of the NECP milestones have been achieved to date, and progress is evident in all of the NECP priority areas, including governance, training, and coordination.

More specifically, since the TICP Validation Exercises of 2007, key improvements have been made by UASI regions in the area of emergency communications. These include:

- Wider adoption of NIMS, including the use of ICS forms such as Incident Radio Communications Plans (ICS 205).
- COML training has resulted in more than 3,500 responders, technicians, and planners being trained to lead communications at incidents across the Nation.
- The use of plain language has been widely adopted and documented in UASI TICPs, which will reduce the risk of miscommunication during incident responses.
- More than 45,000 copies of the *National Interoperability Field Operations Guide (NIFOG)* have been distributed to public safety agencies since OEC began distributing this reference guide in 2007. The NIFOG contains radio frequency information to assist those establishing or repairing emergency communications in a disaster area.
- Communications-specific exercises, which were not prevalent in 2007, were found to have been used in almost every UASI region.

All of these improvements are important steps in developing response capacity and progressing toward interoperability across the Nation. While the results of individual evaluations cannot be used to predict the overall communications capabilities of the UASI regions under all conditions, the results of the NECP Goal 1 assessments show that the Nation's UASI regions have invested in response-level emergency communications capabilities that greatly increase their ability to establish and maintain emergency communications during large-scale planned events.

OEC and its Federal partners will use the NECP Goals assessments to better target internal resources, such as training, grant guidance, technical assistance, and planning for improving interoperable emergency communications nationwide. This approach recognizes that establishing emergency communications is not solely a technology problem that can be solved with just the "right" equipment or the "right" communications system. All of the critical factors for a successful interoperability solution must be addressed—governance, standard operating procedures, training and exercises. Implementing nationwide interoperability is a complex process, and OEC will continue to support responders at all levels of government to ensure to achieve the long-term vision of the NECP, in which emergency responders can communicate as needed, on demand, as authorized, at all levels of government and across all disciplines.

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Appendix A – Interoperability Continuum and Range of Capabilities

Governance	Area decision-making groups are informal and do not yet have a strategic plan to guide collective communications interoperability goals and funding.	Some *formal* agreements exist and *informal* agreements are in practice among members of the decision making group for the area; strategic and budget planning processes are beginning to be put in place.	Formal agreements outline the roles and responsibilities of an area-wide decision-making group, which has an agreed upon strategic plan that addresses sustainable funding for collective, regional interoperable communications needs.	Area-wide decision making bodies proactively look to expand membership to ensure broad representation from public support disciplines and other levels of government while updating their agreements and strategic plan on a regular basis.
SOPs	Area-wide interoperable communications SOPs are not developed or have not been formalized and disseminated.	Some interoperable communications SOPs exist within the area and steps have been taken to institute these interoperability procedures among some agencies.	Interoperable communications SOPs are formalized and in use by all agencies within the area. Despite minor issues, SOPs are successfully used during responses and/or exercises.	Interoperable communications SOPs within the area are formalized and regularly reviewed. Additionally, NIMS procedures are well-established among all agencies and disciplines. All needed procedures are effectively utilized during responses and/or exercises.
Training & Exercises	Area-wide public safety agencies participate in communications interoperability workshops, but no formal training or exercises are focused on emergency communications.	Some public safety agencies within the area hold communications interoperability training on equipment and conduct exercises, although not on a regular cycle.	Public safety agencies within the area participate in equipment and SOP training for communications interoperability and hold exercises on a regular schedule.	Area public safety agencies regularly conduct training and exercises with communications interoperability curriculum addressing equipment and SOPs that is modified as needed to address the changing operational environment.
Usage	First responders across the area seldom use solutions unless advanced planning is possible (e.g., special events).	First responders across the area use interoperable solutions regularly for emergency events and in limited fashion for day-to-day communications.	First responders across the area use interoperability solutions regularly and easily for all day-to-day, task force, and mutual aid events.	Regular use of solutions for all day-to-day and out-of-the-ordinary events across the area on demand, in real time, when needed, and as authorized.

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Appendix B – Levels of NECP Goal Demonstration

1. **Advanced Demonstration:** Response indicative of UASI region's capability to consistently provide response-level emergency communications during routine incidents and events involving multiple jurisdictions, disciplines, and agencies and effectively address a significant incident were it to occur. Indicators may include:
   - Jurisdictions demonstrated strong communications planning using established policies and procedures;
   - Communications systems were effectively utilized and back-up solutions were available if needed; and
   - Operational leadership was able to manage resources and make timely decisions without communications impediments.

2. **Established Demonstration:** Response indicative of UASI region's capability to consistently provide response-level communications during routine incidents and events involving multiple jurisdictions, disciplines, and agencies. Indicators may include:
   - Jurisdictions demonstrated some communications planning using policies and procedures, whether documented or ad hoc.
   - Communications systems were utilized with few difficulties and backup solutions were available if needed.
   - Operational leadership was able to manage resources and make timely decisions without significant communications impediments.

3. **Early Demonstration:** Response indicative of UASI region's capability to consistently provide response-level communications for planned events, but communications and coordination were largely ad hoc, with few documented plans or procedures. Other indicators may include:
   - Communications systems faced technical difficulties, and little consideration was given to reliable back-up methods.
   - Operational leadership was able to manage resources and make decisions despite communications impediments.

4. **Not Demonstrated:** The jurisdictions involved did not demonstrate response-level emergency communications during the observed event due to communications impediments arising from a lack of planning, established policies and procedures, technical solutions, or a combination thereof.

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Appendix C – NECP Goal Demonstration Criteria

Common Policies and Procedures
Criteria 1 Interagency communications policies and procedures were common or consistent amongst all responding agencies.
Criteria 2 Established interagency communications policies and procedures were followed throughout the incident.
Criteria 3 Interagency communications policies and procedures across all responding agencies were consistent with NIMS.
Criteria 4 A priority order for use of interagency communications resources was followed as established in standard operation procedures or plans, such as the TICP.
Criteria 5 A primary interagency operations talk path was clearly established by procedure or communicated to responders early in the incident.
Criteria 6 Common terminology and plain language were used in all interagency communications.
Criteria 7 Clear unit identification procedures were used.
Criteria 8 Common channel names were used for designated interoperability channels.
Responder Roles and Responsibilities
Criteria 9 Multiple organizations with inherent responsibility for some portion of the incident were present and joined in a unified command with a single individual designated with the Operations Section Chief responsibilities.
Criteria 10 Span of control was maintained amongst the primary operational leadership: The Operations Section Chief and first-level subordinates.
Criteria 11 Communications Unit Leader (COML) roles and responsibilities were carried out by the Incident Commander (IC)/Unified Command (UC) or designee. • Necessary communications resources were effectively ordered using documented procedures. • A communications plan was established by procedure or developed early in the incident.
Communications System Quality and Continuity
Criteria 12 No more than 1 out of 10 transmissions was repeated among the primary operational leadership due to the failure of initial communications attempts.
Criteria 13 Upon failure or overload of any primary communications mode, a back-up was provided.
Criteria 14 Primary operational leadership communicated adequately to manage resources and make timely decisions during the incident or event.