Chapter 17

National Incident Management System: Bringing Order to Chaos

Bruce J. Moeller

CONTENTS

Introduction................................................................. 354
History.............................................................................. 355
   FIRESCOPE and Fire Ground Command .................. 355
   Incident Command System ...................................... 356
Overview of NIMS ....................................................... 357
The Incident Command System ............................... 358
Challenges of Incident Management .................... 360
   Situational Awareness ............................................. 360
   Communications...................................................... 361
   Resources ............................................................... 361
Conclusion..................................................................... 362
References...................................................................... 363
Introduction

In the first half of the first decade of the new millennium, the United States was struck by two of its worst disasters—one man-made and one natural. The events of September 11, 2001, terrorized a nation and brought the issues of terrorism and homeland security to the forefront in citizen’s mind. Hurricane Katrina striking New Orleans in 2005 changed our focus back to the threats from natural disasters. Together, these two events provide a fitting context for a discussion on how to bring order to the chaos that ultimately arrives with each disaster.

A disaster is, by almost any definition, events whose demands far outstrip the ability of society to effectively respond. It almost always results in large loss of life and property, or otherwise disrupts society. As such, a certain degree of chaos almost always accompanies its arrival. Hurricane Katrina was one of the most significant chaotic incidents in recent times (Schneider, 2005). Prevention of, preparedness for, responding to, recovering from, and mitigation of potential disasters—whatever they may be—are necessary for any type of incident, manmade or natural. This concept is described as an all-hazards approach to emergency management. U.S. Homeland Security Presidential Directive #5, issued by President Bush shortly after the September 11 attacks, establishes a National Incident Management System (NIMS) to address multi-jurisdictional and multi-organizational challenges that arose from the response to New York City’s World Trade Center (Perry, 2003; Walsh et al., 2005).

Communities that experienced significant disasters have learned all too painfully that emergency management, to be effective, must provide a rapid and effective response. Unfortunately, learning from previous disasters is often limited to the specific lessons of that earlier event. It is often found that “policies and programs have been instituted and implemented in the aftermath of a disaster, based almost solely on that disaster experience, and with little investment in capacity building to deal with the next disaster” (Waugh, 2000). This is most often seen in the development of new programs, or passing of legislation, that has immediately followed major events (Rubin, 2004). Because of these same issues, some critics believe that current efforts to develop a national response system for dealing with all types of disasters will likely fall short (Buck, Trainor, and Aguirre, 2006). Only time will tell if those predictions will come true. However, it is clear that failure by senior managers and leaders to understand the purpose, basic structure, and obstacles to NIMS will almost surely cause their efforts to fail. Accordingly, although this chapter will provide a basic overview of NIMS and issues regarding its successful implementation, the chapter is not intended to prepare individuals to operate under the National Response Plan. Rather, readers should first undertake formal NIMS training and then use the following information as a roadmap to avoid common errors in its implementation.

Community leaders and emergency managers know they must be prepared to provide an emergency response within a coherent system, one that is well-coordinated horizontally and vertically across government agencies. This horizontal and vertical
integration requires a structure that meets two essential criteria. First, the system must be flexible. Flexibility in emergency response is required because of the unknown causes and contingencies that must be addressed when managing a major disaster. Often, it is the lack of experience in dealing with emerging problems that leads to the disaster itself. With time and experience, emergency responders become more proficient and better prepared—making the disaster less so—simply because they have learned from prior events. The corollary to this premise is that first-time incidents challenge emergency managers and policy makers. Experience is a valuable tool when dealing with unknown contingencies.

The second criterion for an effective system is that it must be scalable. The response to an event will always start small, perhaps a single police vehicle or fire engine, regardless of its magnitude. From that point, the event will expand rapidly such as during September 11. In some circumstances there is a delayed acceleration, as when the levies failed hours after the initial landfall of Hurricane Katrina. As the situation becomes clearer, and more resources are brought to bear, the emergency management system must be able to expand and contract as circumstances dictate. The lessons learned from prior disasters help provide a context and understanding of the challenges that emergency managers, political leaders, and ultimately the public must endure in future events.

**History**

The major lessons learned, and experience gained, from emergency response is largely rooted in the American fire service. When “routine emergencies” occur everyday in our communities, law enforcement, ambulance, or the fire service respond. These routine emergencies are called such because the emergency responders are well equipped to handle them—resources are sufficient to manage the event. However, when the incident is of a proportion where demand outstrips resources, a disaster has occurred. Historically, these events have most often been handled by the fire service. Wildland fires, hazardous materials accidents, tornados, or airline crashes have forced the fire service, civil defense practitioners, and other emergency responders to develop more coherent plans. These events require the management of a large number of resources that are necessary to effectively respond. Today’s incident management systems are rooted in the wildfire experiences of the 1970s.

**FIRESCOPE and Fire Ground Command**

The fire service’s first major efforts to develop incident management systems were directed at managing large-scale wildland fire in the western United States. The FIRESCOPE (Firefighting Resources of California Organized for Potential Emergencies) project began in the early 1970s and its focus was on larger rural events.
The need for firefighters from across California, from many different agencies, required significant coordination and support as events often lasted multiple weeks. Wildland firefighters had to be deployed, staged, fed, housed, and supplied. Accounting of personnel, equipment, and other resources was a sizable undertaking.

However, the system did not lend itself well to smaller events of greater frequency that often occur in urban settings. This resulted in several efforts, the most noteworthy being the Fire Ground Command (FGC) system developed by the Phoenix Fire Department. FGC focused on managing basic house fires and other incidents often responded to by urban and suburban fire departments. These events differed from wildland fire fighting in that the number of personnel required to manage the incident was often number less than 20 individuals. These events lasted only hours instead of days and weeks. And most important, the incident was typically handled by a single agency. Although many characteristics were similar, FGC was not designed for all types of events.

Incident Command System

It soon became evident that several issues were unaddressed by the FIRESCOPE and FGC systems. In essence, competing systems, using different nomenclature and approaches, were used for different types of incidents. However, lack of practice and daily integration into operations made users resistant to use the appropriate system when needed, and less proficient when they did. The result was the development of a hybrid system that took advantage of the strengths in FIRESCOPE and FGC. What soon developed was a common nomenclature that was built to be used for daily incidents both large and small, and the infrequent catastrophic events (National Fire Service Incident Management System Consortium, 2000).

An obstacle and mistake often made by inexperienced emergency managers is to attempt to implement a centralized decision-making organization to manage a highly uncertain environment. In fact, although overall policy must be established from a centrally established command center, individuals who are close to the action must make many of the incremental decisions. Those closest to the problem are better suited to identify and react to unexpected contingencies that are inherent in disaster response (Bigley and Roberts, 2001; Roberts, Stout, and Halpern, 1994).

Today, incident command systems are used much more extensively than just in the fire service. The application of incident command system’s has been applied to the recovery operation of the space shuttle Columbia (Donahue, 2004) and the management of a public health outbreak involving the poultry industry (Moynihan, 2005). One of the greatest values in incident command systems is their hierarchical nature—providing an overall structure from which both flexibility and scalability can be achieved. Hierarchy is essential and has been shown to provide better performance in dynamic decision-making environments (Artman, 1999). In recent years, the application of incident command concepts has been applied to fire services
in the United Kingdom. These include a clear line of command, manageable span of control, sectorization of the incident scene, decision support systems, and collaboration between agencies (Smitherman, 2005).

Overview of NIMS


The NIMS is comprised of six major components that work together to establish a structure for local, state, federal, and private sector organizations to use in the response to major domestic incidents. The following summaries of these components outline their overall purpose under NIMS.

Command and management provides the backbone of emergency incident response, the Incident Command System (ICS) that all emergency providers are expected to be familiar with. This component also addresses methods to provide multiagency coordination, both for operations and public information. Public information is an essential dimension of emergency management.

Preparedness encompasses the planning, training, and exercising for emergency response. Many elements of emergency response will not be effective unless they are utilized or exercised routinely. Simply having a written plan will not make for an effective emergency response system. Systems must be used in daily activities, exercised frequently, or developed in a continuing fashion. In addition, the preparedness component considers the needs for personnel and equipment certifications so that effective mutual aid can be accomplished. Although a framework for personnel and equipment qualifications has been developed, there is no final or agreed upon approach for all such areas. Although it is typical for a single entity to have specific meaning assigned to a title or term, no single state or local government can be expected to deal with all types of disasters. Therefore, a common language is essential to allow for a well-coordinated mutual aid response.

Resource management defines standardized mechanisms and requirements to inventory, mobilize, dispatch, track, and then recover assets over the course of an incident.

Communications and information management includes both incident management communications, such as voice and data, and the information management processes necessary for the communication to occur.
Supporting technologies is closely related to the above. Here we are dealing with specific hardware and software systems to make information flow timely and meaningful. Beyond typical limitations, the real trick is these systems must accommodate multiple organizations across geography, jurisdiction, and role.

Ongoing management and maintenance provide a process by which NIMS must ensure both routine review and refinement in its processes. Earlier comments emphasized the value of experience in managing uncertainty. Assuring NIMS utility will require critical analysis of its failures.

The Incident Command System
The major backbone for managing an emergency incident rests with the incident management system. This is not to minimize the need for proper preplanning or training. However, when a large event happens, each responder must know their role under ICS and how they contribute to the overall goals.

Researchers have identified four essential dimensions for affective incident command. These are (1) an effective accountability system, (2) meaningful situational assessment, (3) appropriate resource allocation, and (4) effective communication system (Jiang, Hong, Takayama, and Landay, 2004). ICS allows for each of these dimensions to be met, assuming the incident commander (IC) effectively uses the proper elements of the incident command system. ICS defines basic operating characteristics, the management components, and the overall structure that emergency response organizations must utilize throughout the lifecycle of an incident. The ICS is the cornerstone of NIMS.

In its most typical form, ICSs utilize the concept of a singular command—one individual is in charge. However, the realities of attempting to coordinate multiple entities from multiple jurisdictions required an alternate command structure as well—that of a unified command. In unified command, all other components of the command structure remain intact, and everybody still reports to only a single individual, except for the IC. In unified command strategic decisions, those at the highest level are made by a unified group with representatives from each entity and jurisdiction. It is the role of the IC to be both part of that group and then implement the strategic decisions made under unified command. In practice, unified command is only used in larger incidents where multiple groups, not of the same jurisdiction or organization, are required to successfully manage the event.

The traditional concept of government response to an emergency incident has assumed a single organization would respond and deliver services based on that event. This traditional concept has been replaced to reflect a reality of public services increasingly being provided by multiple organizations rather than a single entity (Moynihan, 2005). This response scenario involving collaborative networks integrated both vertically and horizontally, requires the incident management system to accommodate competing interests. Under NIMS, these competing interests are
managed by a single operational chain of command being led by a single IC taking policy direction from the unified group.

Two essential leadership qualities are a problem-solving orientation and adaptability to rapidly changing circumstances (Donahue, 2004). For the IC, these are necessary traits. Managers, as contrasted with leaders, are often risk adverse. In times of uncertainty, the need for calculated risk-taking and an aggressiveness to attack emerging problems permit the IC to stay ahead of rapidly changing conditions. However, the IC does not manage the incident alone. Many others are involved in developing the strategic priorities and then implementing the incident action plan.

In large-scale incidents, there are four major sections under the IC, each with a specific role. The acronym FLOP is a useful memory aid for Finance/Administration, Logistics, Operations, and Planning. In daily use of ICS, only the operations section is often put in place. In fact, the incident commander often functions both as IC and the operations chief (remember this is a scalable system). The use of a planning, logistics, or finance section only occurs in larger, more complex, or extended operations.

The finance section provides accountability. This is an item often ignored or overlooked in the initial stages of an incident, but the attention of policy makers often shifts to budget impact and accountability for operations when the initial crisis subsides. The finance section, or one of its subordinate units, tracks personnel time dedicated to various functions, expenditures for supplies, and works with the logistics section to obtain necessary resources.

The logistics section provides for the long-term needs and resources often overlooked in major events. Logistics must anticipate long-term requirements for continued operation and assure resources are provided. As with the other sections, various predefined specialty units consisting of communications, food unit, or facilities unit may be needed depending on the long-term operational plan. For example, who is going to feed and provide temporary sleeping accommodations for emergency responders?

The operations section is the most utilized area of incident management. Its organization depends on the specific type of event and the priorities established by the incident action plan. This section may be organized by jurisdictional areas, geographic boundaries, functional needs, or any combination of these.

The planning section’s role is often overlooked in local incidents, where its usefulness is less critical, but also in larger or long-term events where a lack of planning can be critical. The planning section should be comprised of experienced personnel who have the skills to provide meaningful and timely analysis and then project conditions that may exist in the near future. Additionally, many incidents require the planning section to be staffed with subject-matter technical experts whose specific qualifications are determined by the incident at hand.

Experienced IC’s know that success is determined by more than simply “filling in the boxes” on an incident command organizational chart. There are numerous challenges in successfully implementing the ICS. These challenges of incident management need to be considered and addressed to assure successful handling of a disaster.
Challenges of Incident Management

Implementation of effective incident management is not without its challenges. After the terrorist attacks of September 11, three key issues were identified as particularly troublesome. First, emergency responders were able to rely only on voice communications. At least initially, other types of communication were either ineffective or not utilized. Second, there was limited situational awareness. This inability to successfully integrate multiple data sources into the formation of an effective representation of the crisis limited the ability of emergency responders to effectively call for and utilize resources. Finally, long-standing problems between police, fire, and other emergency responders was magnified by the lack of interoperability among their respective communication systems (Bahora et al., 2003). These challenges, and recommended actions to minimize the impact, are detailed below.

Situational Awareness

The ability to achieve and maintain situational awareness is one of the most significant challenges in managing large-scale emergency events. Situational awareness has been described as having a perception of the incident in its current environment, comprehension of its meaning, and a projection of the incident into the near future (Endsley, 2000; McQuaid, 2003).

The loss of situational awareness has been shown to lead to disastrous results. Accordingly, much more effort must be paid to establishing and maintaining situational awareness to successfully manage a large incident. A common problem for incident commanders is the tendency to focus on single components of an incident, disregarding other attributes. This tunnel vision inhibits a true comprehension of the incident and its future impact. Because of that limitation, the ability to forecast near-term events is restricted. To overcome this problem, the IC must perform rapid information sampling. This process requires a continuous assessment of information flowing into the command center, seeking critical clues and essential elements from the overall flow of information rather than focusing on one or two seemingly critical components. This permits the IC to more accurately assess all current conditions and anticipate future ones (McQuaid, 2003).

Sonnenwald and Pierce (2000) found that interwoven situational awareness between the individual, group, and among groups facilitates emergency response. This is accomplished by ensuring frequent communications occurs between all participants. The ability of incident managers, especially among those from different organizations, to establish trust with each other is essential to successful incident management. As emergency events occur without warning, and because of the increasing need of multiple agencies to work together, this positive impact can be obtained by interagency planning and tabletop exercises. The benefits will then be seen when incident managers are put together under live emergency conditions.
However, these efforts may be hampered by “contested collaboration,” a term used to describe competition between groups that leads to dysfunctional actions. Such contested competition is often seen between elite military units during noncombat times. The goal is to ensure these adverse behaviors do not continue once emergency operations are underway. Trust is also enhanced when leaders share norms and a vision of successful incident mitigation. The establishment of shared norms/vision requires a rapid and accurate flow of information from the field, wide dissemination of this information (in raw form) to all team members, and communication among incident managers regarding the meaning of the information received. Such communication often occurs, and is enhanced, when the process is less formal and not constrained by typical hierarchical processes. This leads to a common sense of urgency regarding the incident and its resolution (Moynihan, 2005).

**Communications**

A specific unit under logistics that has received much attention after recent disasters is the communications unit. Many senior managers and policy makers often hear the term “interoperability” when discussing radio communications. Much of this discussion has focused on the radio system itself—the hardware. Yet this is only a part of the issue. Manufacturers have engineered systems to patch multiple radio systems together, though admittedly with some limitations. The larger question is the ability of multiple responders to communicate clearly in an interoperable environment. Some critics stated that a single radio system during September 11 may have dramatically changed outcomes. This assertion ignores the fact that 3000 emergency responders cannot all work on a single radio channel. The ability to organize communications rationally among large numbers of emergency responders, and assure that the right person talks to the right person, is essential. The failure to bring a coherent structure to radio communications will result in chaos. Policies and procedures are needed, and must be exercised, which assign certain functions or organizational units to different radio channels (or talkgroups in a trunked radio system). Communications among these groups must allow for communications between the unit leaders and the overall IC. Predetermination of which channels are used for what purpose will reduce initial confusion in the incident.

**Resources**

The ability to deliver all needed resources to the correct location at the correct time, under emergency conditions, highlights the challenges that await emergency managers. Experience has shown that resources are scarce initially. However in some incidents, such as in hurricanes, the arrival of water and ice may occur days to weeks after the local region is beginning to recover or when demand is already met by other sources. In this later example, a problem develops where supplies are wasted and sit idle.
The planning section must be skilled at predicting needed resources and the burn rate at which expendable supplies are consumed. Operational managers must anticipate how many personnel and equipment will be needed in the future and assure those needs are communicated. Resources arriving to a disaster scene most often will be placed into a staging area where they are checked in before being deployed or used. Therefore, the tracking of resources is essential.

In the aftermath of Hurricane Katrina’s landfall on New Orleans, those remaining in the city fled to the convention center upon advice of city officials. In anticipation of food, water, and ice that never arrived, FEMA lost track of their supplies once they left their initial staging area. In 2006, FEMA made significant efforts to track resources during future disasters. Each truck leaving a FEMA staging area is now equipped with GPS tracking equipment so that disaster managers can track those resources as they move into disaster areas.

Tracking of resources provides for the financial accountability that will be required long after the initial press coverage of an event has waned. Personnel accountability assures the safety of emergency responders and allows managers to know what resources are already on-hand and available for potential redeployment. Tracking of expendable supplies allows for reimbursement and provides information to the planning section so future demands can be anticipated. Although not necessarily a high-profile function, the failure to properly track resources—as was seen during Hurricane Katrina—can have significant impacts on the ability to meet urgent needs of those impacted by an event.

**Conclusion**

Effective response to disasters requires strong leadership. But leadership cannot occur in a vacuum. The basic structure that NIMS hopes to achieve allows for emergency responders to understand their role, to whom they report, the overall objectives of their tasks, and how this all fits together. Therefore, leadership requires setting a clear mission and communicating that mission clearly to all emergency responders. Local leaders, especially elected officials, need to assure that incident commanders have the necessary resources needed to accomplish the mission. This requires that typical justification for resources and cost accounting be relaxed. Flexibility is required as uncertainty exists in disasters. Further, scalability and the ability to respond quickly require that some resources may be ordered in anticipation of future requirements, and then are never needed. Such circumstances are unavoidable and must be tolerated during extreme circumstances.

Most importantly, both elected officials and senior managers must prepare to manage potential disasters. This requires training and the building of capacity. The establishment of robust communications systems and the design of information systems to achieve and maintain situational awareness will require capital. Emergency responders must then plan and practice their response. Certain
elements must be institutionalized so that everyday practices will prove useful in extreme events. Only then can communities hope to avoid the chaos inherent in disaster management.

References


