

Perspectives on Preparedness

September 2001
No. 4



BELFER CENTER FOR SCIENCE AND
INTERNATIONAL AFFAIRS
TAUBMAN CENTER FOR STATE AND
LOCAL GOVERNMENT



U.S. DEPARTMENT OF JUSTICE
OFFICE OF JUSTICE PROGRAMS
OFFICE FOR STATE AND LOCAL DOMESTIC
PREPAREDNESS SUPPORT

Executive Session on Domestic Preparedness

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AN OVERVIEW OF INCIDENT MANAGEMENT SYSTEMS

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When coping with a natural disaster, wildfire, or disease outbreak, numerous agencies at the local, state, and federal levels have to effectively communicate, coordinate operations, and allocate resources. This is equally true in the event of a serious terrorist attack. How can personnel and organizations that do not normally work together do this effectively? One solution to the potential problems of divided leadership, parallel chains of command, operational conflicts, competing resource demands, and unfamiliar professional terminology is an Incident Management System (IMS), which is designed to manage complex or multisite emergency events. This paper provides an overview of the purposes and principles of IMS.

IMS is a generic term for the design of ad hoc emergency management teams that coordinate the efforts of more than one agency under a unified command. It is a functionally based organizational template that facilitates information flow, decision-making, and operational coordination. The basic idea is that an incident commander or a unified command team is responsible for the successful resolution of the emergency through a process of authority delegation and coordination among many participating agencies. IMS emphasizes joint problem solving to meet the needs of the emergency situation. What makes the system distinctive is that it creates a clear chain of authority that can quickly

orchestrate collaborative operations by diverse organizations that have had little or no previous operational relationships.

There is a common misconception that an "incident" requiring emergency response personnel is small scale and occurs at a single location. On the contrary, many crises are multisite, catastrophic, or temporally extended events that tax existing response capacity. The potential scalability of IMS – the ability to accommodate small and large events – is one of its virtues. It is most important when a large-scale incident (an event or series of events that are components of a natural or man-made disaster) occurs. For example, in the Oklahoma City bombing, the affected geographical area was small, but the response involved multiple rescue, firefighting, law enforcement, and EMS units. In Hurricane Andrew, the disaster area was large and involved hundreds of events. Thus, "incident" is a broad term applied to a single event in a restricted locale (such as a fire or SWAT operation) or a group of events taking place in a wide geographical area (such as a hurricane, earthquake, or disease outbreak).

History and Development

In the 1970s, California's firefighting resources were severely taxed by major wildfire outbreaks. These incidents

required the cooperation of many independent firefighting agencies. Historically, the agencies had not worked together. As a result, they competed for turf, supplies, and equipment in a resource-scarce environment. The California experience revealed several key problems.

- There was no clear-cut leader or incident manager. In some jurisdictions, protocols or statutes clarifying responsibility for disaster management were lacking. In other areas, conflicts arose among fire chiefs of the affected jurisdictions, federal officials, and local and state elected officials. Individuals from each agency believed that they had a legitimate reason to be in charge.
- There was no collaborative organizational structure that established a chain of command, sub-leadership positions, or an appropriate span of control. Organizations were totally separate from other organizations. The system did not allow disparate agencies to integrate their operations.
- There was no common terminology. Each agency had its own professional vocabulary, which led to confusion. For example, urban firefighting units referred to a large water tank truck as a “tanker,” whereas wildfire agencies were describing airplanes that dropped water as “tankers.”
- There was no joint communications system. Most participating agencies possessed communications systems that were technologically incompatible with the systems used by other assisting agencies. Fire or police units could see each other but could not talk to one another on the radio.
- There was no system for allocating scarce resources. This often resulted in logistics competition between agencies.

In response to these problems, California pioneered a system aimed at resolving the major issues of coordination and resource allocation in wildfires or other disasters. The

resulting product was originally called the Incident Command System (ICS), later renamed the Incident Management System. The change evolved because the word “management” better describes the system and process than the word “command,” emphasizing consensus building and coordination, as opposed to hierarchy.

The original system was designed for wildland fire operations but was adopted in the 1980s by the urban fire service and spread to other states. In the early 1980s, law enforcement leaders in Southern California recognized the benefit of adapting the fire service’s ICS to meet the needs of large-scale law enforcement activities. The Police Officers Standards and Testing (POST) organization sanctioned the Law Enforcement ICS (LEICS) development, providing reimbursement for LEICS classes taught to law enforcement personnel. The first major incident management under LEICS was a Pacific Southwest Airlines plane crash in a rural part of San Luis Obispo County. Sheriff’s personnel credited LEICS for its ability to manage this event, involving law, fire, and medical personnel from a variety of jurisdictions. LEICS became the basis for the law enforcement and public safety services planning for the 1984 Los Angeles Olympic Games. This Olympics involved more than 100 local law enforcement agencies, and more than a dozen federal law and military organizations.

After the 1989 Loma Prieta earthquake in California, the hospital-based medical community recognized the need to adapt the Incident Command System to its disaster response requirements. The earthquake placed a huge demand on hospital resources, notably in isolated areas such as Half Moon Bay and Watsonville. The Orange County California Emergency Medical Services Agency developed the Hospital Emergency Incident Command System (HEICS) to guide the planning, training, and response of hospital personnel. This system allows for the integration of fire, fire service-based medical, law enforcement, and emergency medical transport resources with the hospital’s receiving and patient care capabilities. HEICS has proven useful in floods and in the Northridge earthquake that struck California in 1994.

The evolution of IMS continued in the 1990s when other agencies throughout the United States realized that IMS could be adapted for different types of disasters. IMS has demonstrated its flexibility across a broad array of incidents, including hurricanes, security preparations for the Olympic Games in Atlanta, Georgia, a papal visit to St. Louis, Missouri, and an ice storm in New York. In each case, IMS provided a management template for different agencies – including the U.S. Department of Health and Human Services, EMS, law enforcement, the American Red Cross, public health, and hospitals – to work together. Emergency workers from many states and localities were thus able to communicate and coordinate operations effectively.

Unified Management

There are numerous reasons why IMS has been widely adopted and applied to emergency support situations. It offers many advantages, including:

- a functional management system that integrates personnel from different home organizations;
- identification of an incident manager or a unified management team when jurisdictional areas or responsibilities overlap;
- standard terminology that facilitates cooperation (although some minor regional variance remains);
- rules for chain of command, unity of command, and span of control;
- protocols for communications and flow of information;
- emphasis on logistics planning and centralized resource allocation; and
- planning functions on an equal level with operations and logistics functions.

In addition, IMS addresses potential conflicts in the management of a crisis. In a pure

incident management system, a single incident manager is accountable for all response activities. Many emergency incidents are too complex, however, for a single manager. In the World Trade Center bombing in New York City, for example, the crime scene was vast and contained mass casualties and major firefighting and rescue challenges. The management responsibilities required a unified team consisting of EMS, fire department, and law enforcement managers. As a further complication, the fire and rescue branch expanded to include federal teams; law enforcement comprised several federal agencies as well. A single incident manager could not have been effective under these circumstances.

Reliance on a single incident manager, moreover, is not always operationally or politically realistic. A major wildfire or a disease outbreak may span city limits, county boundaries, and even state lines. Involved regions can include federal facilities and federally administered land. The wildfire at Los Alamos National Laboratories in the summer of 2000 consumed land belonging to the U.S. Forest Service, the Los Alamos National Laboratory Reservation, and the city of Los Alamos, New Mexico. Operational problems included wildland fire fighting, a major evacuation (including hospitals), radioactive hazardous materials clean up, and national security issues. Naming a single incident manager was not politically feasible.

The incident management system utilizes the concept of unified management for these complex incidents. Unified management is a team effort process that allows all agencies with responsibility for an incident (geographical or functional) to establish a common set of incident objectives and strategies. A lead agency is designated based on the core problem being confronted; but other agencies share responsibility and participate in decision-making. The process of unified management is similar to joint forces operations in the military.

A basic tenet of unified management is that the operational manager (operations section chief) is from the lead agency and directs all

operations branches. A single operational commander (the operations section chief) develops tactical plans and directs tactical operations. Administrative and policy management (as opposed to tactical management) remains under the internal control of the respective agencies. For example, in a biological terrorism incident, a unified management team consisting of a state executive branch official, a law enforcement executive, and a medical/public health officer might be named. In this case, the lead agency would be the medical agency, with a medical operations section chief.

The Functional Organization of IMS

Organizationally, the incident manager or the unified management team – should one exist - is responsible for all aspects of the incident and is directly responsible for all sectors not delegated to other personnel. One level below, IMS establishes four distinct functional subunits: operations, logistics, planning, and finance/administration. In IMS terminology, these functions are called sections and are supervised by a section chief.

The planning section devises long and short-term plans, maintains status boards, and tracks resources. The operations section oversees the tactics and/or tasks needed to accomplish assigned objectives (the operations section chief is from the lead agency if unified management is utilized). The logistics section

supports all elements in the IMS such as equipment, supplies, communications, food/water, and facilities. Finally, the finance/administration section maintains personnel records, payroll and finance records, and workers' compensation files.

Span of Control

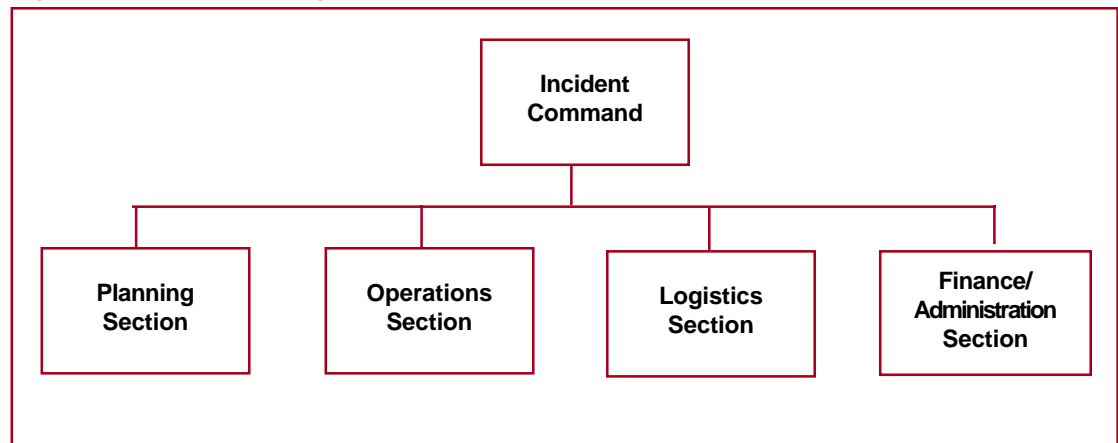
In a disaster management system, the concept of span of control is important. It refers to the number of people that a single supervisor can successfully manage and coordinate. Business management texts suggest five to seven people as an effective span of control. In tactical operations, three people is a practical span of control.

Span of control applies to the supervision of locations and units as well as individuals. Consider an incident that begins in a single locale and expands into several states. At the national level, the span of control begins to expand to criticality.

IMS Organizational Levels

An incident management system is therefore tiered. The organizational layers are used only when appropriate and utilized only as dictated by system complexity. The highest management level is the general staff, which includes the management staff and the four functional section chiefs. The hierarchical layers are section (managed by a section chief); branch (managed by a branch director);

Figure 1: The Functional Organization of IMS



division/group (managed by a division/group supervisor); strike team/task force (managed by a strike team/task force leader); and unit (managed by a unit leader).

A branch is the organizational level having functional or geographical responsibility for major parts of incident operations. A division is a unit of operation designed to further divide a branch into geographical sectors. For example, in a regional disaster with three events, the operations section will coordinate three different locations (a span of control of three). If medical operations were expanded to six events, however, the span of control would be too wide. In this case, the incident is divided into two divisions, with three events assigned to each division. Now the operations section chief is managing two division leaders, who in turn each manage three events. At each layer, the span of control is three or fewer.¹

Strike teams and task forces are organizational tools that provide flexibility when there are multiple missions. A strike team is a specified combination of the same type of resources with common communications and a leader. A five-person medical team is an example of a strike team. A task force is a specified combination of unlike resources with common communications and a leader. For example, a team of four law enforcement units assigned for area security is a strike team as is a team of three EMS units and two epidemiologists sent to a given locale for surveillance or medical assessment is a task force. Task forces and strike teams are formed or broken down as dictated by the mission.

IMS Staffing and Training Issues

Staffing is a central concern of IMS operability, particularly at the local, division, and facility levels. Obviously, a major incident severely taxes staffing — especially at the state and local levels. Furthermore, span of control issues drive staffing decisions. There are several possible solutions to staffing issues.

- The units described in the previous pages may be used only when needed.
- The IMS units are functions, not people. Management personnel can perform more than one function.
- The incident manager automatically assumes all duties not assigned. This is a benchmark IMS rule.
- Incident managers need to be creative in delegation.

The preparedness of staff for disaster response is also a crucial issue. The strength of IMS is its simplicity. Proficiency in IMS is not intuitive, however. Organizations that utilize IMS often and conduct formal and certified training in incident management are the most proficient in IMS skills. IMS training builds on increasing levels of expertise:

- familiarization;
- basic awareness;
- basic IMS;
- advanced IMS; and
- IMS certification.²

Other organizations are beginning to recognize the importance of IMS training for senior decision-makers. This is especially true in

¹ Professional disciplines refer to the division concept in different ways. The urban fire service and medical organizations often refer to divisions as “sectors.” Medical operations are almost always divided into a triage sector, treatment sector, and transport sector. The word “sector” is acceptable IMS terminology but applies only to tactical operations.

² The familiarization and basic awareness levels are not formal courses. Basic and advanced IMS are formal courses. The National Wildfire Coordinating Group is currently the only national organization that officially certifies IMS competence. To become “red carded,” an individual must complete a series of formal courses and demonstrate required field experience by completing task-book requirements. This type of certification is unusual outside of the wildfire community. Various state and local training programs often certify their own members but are not authorized to red card an individual. Many fire departments, law enforcement, and EMS agencies also certify trainees (non red-card certification).

federal agencies that now require IMS structuring at major incidents. The Federal Bureau of Investigations, the U.S. Coast Guard, and the Federal Emergency Management Agency are examples of agencies that have built response systems on the basic IMS model. In 2001, IMS protocol was written and adopted by the U.S. Public Health Service/Office of Emergency Preparedness as doctrine for emergency operations by Disaster Medical Assistance Teams.

Formal IMS training programs begin at the unit level and provide certifications through every management level up to incident manager. In-depth programs of this nature are not practical for non-tactical agencies. A practical and feasible approach is a basic program that consists of an overview of the IMS system and exposure to IMS forms and documents. Midlevel and senior managers should participate in at least one tabletop exercise per year. Participation in local public safety exercises is encouraged.

A basic IMS awareness level can be obtained through self-study. An IMS familiarization program is as short as four hours of basic incident management organization. A basic IMS class is at least an eight-hour program where managers are exposed to the four major IMS functions (administration, planning, logistics, and operations) and participate in a tabletop scenario. The emphasis of the basic IMS level is how various agencies and functions integrate operationally, effectively communicate, and allocate scarce resources.

Conclusion

Incident management systems attempt to resolve the problems inherent to large-scale natural and man-made disasters. IMS is designed to facilitate rapid management and coordination of agencies that may never have worked together prior to the incident at hand. One of the strengths of IMS is its flexibility and thus its ability to adapt to a rapidly expanding incident that may involve several operational challenges at multiple sites.

This project was supported by Grant No. 1999-MU-CX-0008 awarded by the Office for State and Local Domestic Preparedness Support, Office of Justice Programs, U.S. Department of Justice. The Assistant Attorney General, Office of Justice Programs, coordinates the activities of the following program offices or bureaus: the Bureau of Justice Assistance, the Bureau of Justice Statistics, the National Institute of Justice, the Office of Juvenile Justice and Delinquency Prevention, and the Office for Victims of Crime. Points of view or opinions in this document are those of the authors and do not necessarily represent the official position or policies of the U.S. Department of Justice.

Appendix A

The Management Staff

The incident manager is responsible for all non-delegated IMS functions. Because of staffing limitations at local levels, the incident manager may have many duties in addition to overall supervision of the response.

In a fully staffed IMS, the incident manager has a management staff. The management staff consists of a liaison officer, safety officer, and public information officer. The management staff duties are as follows:

- Liaison officer — point of contact for outside agencies; monitors operations to identify potential interorganizational problems.
- Information officer — responsible for the formulation and release of information to the media; organizes and conducts media briefings; coordinates media releases with other operational agencies or organizations.
- Safety officer — monitors all facilities and operations to ensure safe procedures; authorized to immediately halt any procedures, operations, or tasks that present a hazard to medical or other personnel. (Note: The safety officer position is mandated by OSHA requirements.) A safety officer should be appointed at the predeployment stage. An incident manager should not attempt to perform safety officer functions.

Operations Section

The operations section is the most visible function of the incident management system. Operations are dynamic, hands-on functions. Response agencies are identified by their operational functions. Common operations functions include:

- Fire/Rescue – responsible for fire fighting, rescue, search, and hazardous materials.

- Law Enforcement – responsible for scene security, hostage negotiations, crime scene investigation, and intelligence.
- EMS – responsible for triage, treatment, transport, and air-medical.
- Public Works – responsible for debris removal, road clearing, bridging, shoring, and sanding and diking.
- Public Health – responsible for disease surveillance, epidemiology, food and water inspection, and laboratory analysis.

The operations section chief should be from the lead agency in a disaster operation. For example, in a hostage incident or mass shooting, the lead agency is law enforcement. In a disease outbreak, the lead agency is public health.

It is notable that several operational functions are common to most disasters. A flood, a hurricane, and an earthquake all require mass sheltering, evacuation, debris clearance, hazardous materials operations, search and rescue, medical care, and scene security.

Major terrorism incidents involve several critical operations functions that must be coordinated through the IMS. (Remember that each operations function has to compete for scarce resources.) The World Trade Center attack (September 11, 2001) was a quintessential complex incident. Critical operations functions included:

- Fire fighting;
- Urban search and rescue (heavy rescue);
- Crime scene discipline and evidence recovery;
- Medical emergency care (triage, treatment, transport);
- Public works (debris removal, construction shoring);

- Scene security and traffic control;
 - Public health (body fluid isolation, sanitation, dust inhalation control);
 - Hazardous materials operations; and
 - Mortuary operations
- Ground support unit – responsible for auxiliary power, transportation, and fueling and maintenance of vehicles and equipment.

The Logistics Section

Virtually by definition, disasters are resource-scarce environments. The logistics section chief is responsible for:

- Communications unit – responsible for establishing communications networks and information systems for tactical, regional, and national information services; tracks and maintains communications and information infrastructure.³
- Food/water unit – responsible for determining food and potable water requirements for patients and emergency personnel.
- Supply unit – responsible for ordering equipment, personnel, supplies, and medical supplies; stores supplies/equipment and maintains an inventory.
- Facilities unit – responsible for the layout and operation of facilities related to the disaster (e.g. tent cities or temporary leased facilities).
- Security unit – responsible for providing safeguards for the protection of emergency responders and support personnel, facilities, and property from loss or damage.

The logistics section chief must coordinate with the incident manager, the operations section chief, and the planning section chief. Additionally, the logistics section must maintain a continuous liaison with all units for supply and equipment ordering.

The Planning Section

The planning section chief is responsible for the collection, evaluation, dissemination and use of information about the development of the incident. The planning section also tracks all resources utilized and displays critical information regarding the status of the incident.

The planning section chief coordinates with the incident manager and the other section chiefs in the preparation of the daily incident action plan (IAP). For example, an IAP might be prepared at the national level, state level (branches), or the regional/local level (divisions).

An important duty of the planning section chief is the planning of the incident action plan briefing. A plan is devised based on an operational period. This period can be four to six hours, twelve hours, or daily. The planning operational period depends on the level of the incident (national, regional, state, or local) and the stage of the incident (beginning, middle, or end). The planning briefing consists of strategy and missions, weather, safety issues, and any relevant information relating to the team activity for the briefing cycle. Planning

³ In the IMS structure, the communications unit is assigned to the logistics section. Many operational and logistics functions require effective communications and information services. These functions include coordination with federal, state, and local agencies and supply ordering, air and ground operations, and response teams. Communications and information specialists must track equipment, and implement appropriate networks and infrastructure for voice/data communications. The communications unit also maintains and updates the incident communications plan (ICS form 205).

briefings occur at each level in the IMS from the federal level down to individual teams or facilities.

Incident action plans may begin as local documents. The County Emergency Management Plan is the critical starting point because all disasters are local. The county IAP rolls up to join with other counties to create a regional IAP, which rolls up to a state plan, and finally a national level plan (the Federal Response Plan). Most important, IMS provides a structure for local plans to escalate into a national plan for disaster operations.

- Resources unit — maintains check-in list of all resources; prepares and maintains all resource status information by using Resource Status Cards.
- Situation unit — collects and organizes situational information; maintains display boards of key information such as weather, safety issues, shift schedule, etc.
- Document unit — maintains and stores incident files and provides duplication services.
- Demobilization unit — assists the incident manager and the logistics section chief in the development of the team demobilization plan and check-out procedures.
- Technical adviser – individual(s) with special knowledge or expertise relating to the incident.

The Administration/Finance Section

Administration and finance has implications that are national in scope in a major disaster because some state/local disaster management expenses are reimbursable by the federal government. These issues “drill down” to state and local IMS structures. The resource-scarce environment mentioned previously creates an intense finance and purchasing environment.

The Finance/Administration Section Chief is responsible for the maintenance of all records and files relating a disaster event. The responsibilities of this section include:

- Time unit — responsible for compiling information on dates and hours worked by federal, state, and local personnel.
- Compensation claims unit — responsible for recording and submitting workmen’s compensation claims or other claims relating to the disaster.
- Cost unit — responsible for collecting all cost data and providing cost estimates and cost saving.
- Procurement unit — responsible for administering all financial matters pertaining to all vendor contracts.

Appendix B: Information Resources

A primary issue for nontactical agencies or organizations is obtaining sources for IMS training and reference materials. Reference materials and home study courses are available from the NWCG, Great Basin Supply Office, 3833 S. Development Ave., Boise, ID 83705. The National Fire Academy (www.fema.gov) and emergency services publishers such as Brady Publishing (The EMS Incident Management System, ISBN 0-89303-972-1) are additional sources. Professional level instructors are available through local wildfire agencies (U.S. Forest Service and/or state forestry agencies), community colleges, public safety training academies, and private contractors.

IMS forms are brief, concise, and can be filled out in a manner of minutes by the appropriate section chief or unit leader. IMS forms can be downloaded (Adobe format) at <http://www.nwcg.gov/pms/forms/icsforms.htm>. The printed forms can also be ordered for nominal cost from:

National Interagency Fire Center
National Wildfire Coordinating Group
Catalog Part 2: Publications (NFES #3362)
Great Basin Cache Supply Office
3833 S. Development Avenue
Boise, ID 83705

IMS Forms

A common belief in disaster operations is that forms and paperwork are not important because managers are too busy. IMS forms are an exception. The national incident management system is based on a series of practical scene management forms. (Many of these forms are generic. Some are specific to the wildland fire fighting community but are easily adapted for use in other organizations.) The forms are very useful as a tactical checklist at local levels, and an organizational template at national levels. Key items in the forms that are blank trigger a warning to on-scene managers to get the proper answers. For example, the Incident Objectives Form (202ICS) requires a weather forecast and safety objectives. The forms serve as an excellent guideline for preparing an incident action plan and daily briefing. The forms also serve as a source of archived information for financial reports and after-action reports.

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September 2001
No. 4