Emergency Incident Management Systems
Fundamentals and Applications

LOUIS N. MOLINO, Sr.
Emergency Incident Management Systems
The Authors and Contributors would like to dedicate this book to the members of all emergency services disciplines that have died or been injured in the line of duty in service to the citizens of the United States of America.
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In a project of the magnitude such as this book there is no "one man band" at work. More often than not it is a culmination of the work of many people. Some do small things like read one chapter; others are there for all of the steps that it takes to get a book to the presses today. I’d like to thank all of them here and individually but that would double the size of the book overall so I’ll try and thank those that played major roles in this project:

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And lastly to my kids, just thanks for being my kids.
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CONTENTS

Acknowledgments, vii
About the Author, ix
Preface, xix

1 INTRODUCTION AND HISTORY OF EMERGENCY INCIDENT MANAGEMENT SYSTEMS (IMS) 1

The Military Connection, 1
The Birth of IMS: FIRESCOPE, 5
   Evolution of Three IMS Systems, 7
The Melding of the IMS Concepts of Today, 10
The United States Coast Guard (USCG), 10
The Occupational Safety and Health Administration (OSHA), 11
The Environmental Projection Agency (EPA), 11
   Other Agencies, 12
   Conclusion, 13

2 THE FIVE “C’S” OF COMMAND 15

Introduction, 15
   Command, 16
   Control, 16
   Communications, 18
   Coordination, 21
   Cooperation, 22
   Conclusion, 23
3 THE EVOLUTION OF THE MODERN APPLICATION OF INCIDENT MANAGEMENT SYSTEMS

Taking Control, 26
Adding to the Chaos, 28
Conclusion, 29

4 COMMON COMPONENTS OF THE INCIDENT MANAGEMENT SYSTEM

Operating Requirements, 32
  Incident Management System Commonalities, 35
  Common Terminology, 35
  Organizational Functions, 38
  General Staff, 41
  Modular Organization, 43
  Organizational Flexibility, 43
  Integrated Communications, 44
  Consolidated Incident Action Plans, 45
  Manageable Span of Control, 46
  Pre-designated Incident Facilities, 47
  Comprehensive Resource Management, 47
  Management by Objectives, 48
  Unified Command, 48
  Unity and Chain of Command, 49
  Establishment and Transfer of Command, 49
  Common Terminology, 50
Conclusion, 50

5 MAJOR COMMAND FUNCTIONS OF THE INCIDENT MANAGEMENT SYSTEM

Command, 53
  Agency Administrator, 54
Unified Command, 55
Incident Commander Responsibilities, 55
Assessing the Situation, 56
CONTENTS  xiii

Determining Incident Objectives and Strategy, 56
Establishing Immediate Priorities, 57
Establishing an Incident Command Post, 57
Establishing an Appropriate Incident Management Organization, 57
Ensuring that Planning Meetings are Scheduled as Required, 58
Approving and Authorizing the Implementation of an Incident Action Plan, 58
Ensuring that Adequate Safety Measures Are in Place, 59
Coordinating Activity for Command and General Staff, 59
Coordinating with Key People and Officials from Concerned Agencies and Organizations, 59
Approving Requests for Additional Resources or for the Release of Resources, 60
Keeping Agency Administrators Informed of Incident Status, 60
Approving the Use of Students, Volunteers, and Auxiliary Personnel, 60
Authorizing Release of Information to the News Media, 60
Ordering the Demobilization of the Incident, 61
Developing and Overseeing the Creation of Any Post-Incident After Action Reports Regarding the Incident, 61
Characteristics of an Effective Incident Commander, 62
Chain of Command Basics, 62
Command Staff, 62
Information, 63
Safety Officer, 65
Liaison Officer, 66
Agency Representatives, 67
Intelligence Officer, 68
General Staff, 68
Operations Section, 69
Geographic Divisions, 70
Functional Groups, 71
Combined Divisions and Groups, 72
Branches, 72
Staging Areas, 73
Air Operations Branch, 74
Resource Organization, 75
Planning/Intelligence Section, 75
Planning Section Chief, 76
Situation Unit, 78
Field Observer, 78
Display Processor/Geographic Information System Technician, 79
Weather Observer, 79
Documentation Unit, 79
Demobilization Unit, 80
Intelligence Unit, 80
Technical Specialists, 80
Fire Behavior Specialist, 82
Environmental Specialist, 83
Resource Use Specialist, 83
Training Specialist, 83
Technical Units, 83
Logistics Section, 84
Service Branch, 85
Communications Unit, 85
Medical Unit, 87
Food Unit, 87
Support Branch, 88
Supply Unit, 88
Facilities Unit, 89
Ground Support Unit, 89
Finance/Administration Section, 90
Time Unit, 93
Procurement Unit, 93
Compensations/Claims Unit, 95
Conclusion, 95
6 THE PLANNING PROCESS IN INCIDENT MANAGEMENT SYSTEMS

Meetings, Huddles, Plays, 99
The Incident Action Plan, 106
Management by Objectives, 107
Incident Command System Forms, 107
ICS 201 Incident Briefing Form, 109
Incident Objectives Form, 109
Organization Assignment Form/Organization Chart, 109
Assignment List, 109
Incident Communications Plan, 118
Medical Plan, 118
Site Safety Plan, 118
Incident Status Summary, 118
Check-in List, 118
General Message Form, 124
Unit Log, 124
Operational Planning Worksheet, 124
Radio Requirements and Frequency Assignment Worksheets, 124
Support Vehicle Inventory, 124
ICS 219 Resource Status Cards, 124
Air Operations Summary, 131
The Incident Action Planning Process, 131
General Responsibilities, 131
Preplanning Steps, 137
Conducting the Planning Meeting, 138
Set Control Objectives, 140
Plot Control Lines and Division Boundaries on Map, 140
Specify Tactics for Each Division, 140
Specify Resources Needed by Division, 140
Specify Operations Facilities and Reporting Locations, 141
Place Resource and Personnel Order, 142
CONTENTS

Consider Communications, Medical and Traffic Plan Requirements, 142
Finalize, Approve, and Implement Incident Action Plan, 142
How to Write a Good Objective, 143
Conclusion, 146

7 THE LOGISTICS PROCESS
Branch Directors, 151
Service Branch, 151
Communications Unit, 151
Medical Unit, 154
Food Unit, 156
The Support Branch, 156
Supply Unit, 157
The Facility Unit, 159
The Ground Support Unit, 159
Conclusion, 161

8 CUSTOMIZING INCIDENT MANAGEMENT SYSTEMS FOR SPECIFIC APPLICATIONS
SECTION ONE—HOSPITAL EMERGENCY INCIDENT MANAGEMENT SYSTEMS, 163
NFPA Standards 1500 and 1561, 166
Standardized Emergency Management System (SEMS), 166
Regulations and Standards, 168
Integration, 170
The HEICS Organizational Chart, 170
Utilization, 173
Case Study, 173
Documentation and Casualty Reporting Issues, 174
Cost Tracking, 174
Triage at the Scene versus the Hospital, 174
Why “Do” HEICS?, 175
The General Staff, 175
Use of Colors in HEICS, 177
Conclusion, 180
SECTION TWO—LAW ENFORCEMENT INCIDENT MANAGEMENT SYSTEMS, 181
The Mindset of Law Enforcement, 182
The Small-Scale Incident, 183
The Large-Scale Incident, 188
The “Big One”: Catastrophic and Apocalyptic Events, 194
Conclusion, 195

SECTION THREE—THE USE OF INCIDENT MANAGEMENT SYSTEMS IN AGRICULTURAL INCIDENTS, 197
The History of the Incident Command System, 198
National Incident Management System, 199
Advice from Local Governments to Business Continuity Planners, 201
Incident Management Systems/ Business Continuity Planning
Governance, 205
Organizations, 208
Step 1: Establish an Internal Planning Team, 208
Establish Authority, 208
Develop a Mission Statement, 208
Step 2: Analyze Capabilities and Hazards, 208
Identify Codes and Regulations, 209
Identify Critical Products, Services, and Operations, 209
Identify Internal Resources and Capabilities, 209
Identify External Resources, 209
List Potential Emergencies, 209
Step 3: Develop the Plan, 209
Emergency Management Elements, 209
Emergency Response Procedures, 209
Supporting Documents, 210
Step 4: Exercise the Plan, 210
Step 5: Implement the Plan, 211
CONTENTS

Case Study—The Exxon Valdez Oil Spill, 211
Case Study—The University of Colorado, Boulder, and Coors Brewing Company, 213
Conclusion, 214

9 ADVANCED INCIDENT MANAGEMENT SYSTEM CONCEPTS 217

Incident Management Teams, 217
   Background, 217
   Definition, 218
   Typing of Incidents, 219
Typing of Incident Management Teams, 221
Incident Management Team Training, 222
Unified Command, 225
   When a Unified Command Should Be Utilized, 226
   Unified Command Membership, 226
   How the Unified Command Makes Decisions, 227
   Representatives Outside of the Unified Command Structure, 228
   Advantages of a Unified Command, 228
Unified Command Meeting, 229
   Set Priorities and Objectives, 230
   Present Considerations, 231
   Develop a Collective Set of Incident Objectives, 231
   Adopt an Overall Strategy, 231
   Select a Unified Command Spokesperson, 231
Conclusion, 232

APPENDICES

A Incident Command Post Systems Position Description Checklists, 233
B Incident Command System Forms, 277
C Hospital Emergency Incident Command (HEICS) Job Action Sheets, 385
D Examples of Tactical Worksheets for Incident Command, 485
   Glossary, 495
   Index, 515
PREFACE

Since its beginning after September 11, 2001 this book project has been a series of roller coaster rides. Sometimes the project was going up hill and sometimes it was going down hill (seemingly very fast), but this was a result of the fact that on that date the emergency services world changed forever almost in a blink of an eye. The world of emergency services Incident Management Systems got very complicated on that day and it has changed in many ways. But, when examined closely, it has remained more like it was before that date than it has changed and that in itself is a credit to the men and women that developed the systems in place for such incident management before that day. The Emergency Incident Management System of today and those that develop tomorrow are based on those earlier systems and all of the sound footwork that was done long before that second day that will live in infamy. This book is by no means the "be all end all" text on the topic as there could never be such a text due to the dynamics of the topic. This book is hopefully one more brick in a solid wall that builds an even more capable Emergency Incident Management System of the future.
Chapter 1

INTRODUCTION AND HISTORY OF INCIDENT MANAGEMENT SYSTEMS

It has been said, “Necessity is the mother of all invention”. As with all great inventions such as the telephone or the automobile, the needs of select groups of people have led to the invention of what we now call “Incident management Systems”. Unlike any physical invention, the Incident Management System, or rather its precursor the Incident Command System, is not a physical thing that one can pick up. It is rather a concept or more correctly stated, a set of ideas, policies, procedures and or ways of “doing things” that will, when employed properly, bring control to chaotic emergencies of all types.

Many people, including this author, have attempted to date with a degree of specificity the development of the Incident Command System. This task has proven nearly impossible as many different concepts have evolved over the past forty years, not in a linear format but rather more concurrently, leading emergency services to this point in the developmental of emergency Incident Management Systems. The unthinkable occurred on September 11, 2001, changing the world, as we knew it forever.

This set of concepts, known collectively as Incident Management has become even more necessary due to events of September 11, 2001 both in the United States and throughout the world. The concepts are still, and dare it be said, will forever be developing in fact due to those events and are in some ways developing even more rapidly than before because of it.

THE MILITARY CONNECTION

Since the dawn of man, men have had disagreements. Those disagreements have grown into fights. The fights have become wars. The desire of making war has led man on a seemingly endless quest to better his ability to engage in and win such battles. In that quest, the science of war has evolved. In some circles, it has become known as the “art of war”.

1
Much of the "art of war" revolves around four elements: command, control, coordination and communications, collectively known as "C4". It should be noted that the military often uses the acronym "C4I". The "I" represents the element of Intelligence. Many would argue that in the post 9/11 era this element is also an emergency services concern and that will be discussed later in this work. These same elements are needed to tackle and conquer nearly any form of emergency response situations.

The United States military has evolved from men with muskets and swords on horseback to what is very likely by far the most precise, sophisticated military force on the planet. Emergency services in the United States have also evolved, from the days of a single constable and a bucket brigade in a large city into modern-day police forces and the American Fire Service, who with other contemporary delivery systems, provide emergency response services of all forms to all citizens. Each utilizes a great deal of technological marvels in their work, not unlike that of our military forces.

The technological revolution has begun to spiral at a seemingly amazing rate in today's digital age both in the military and in the emergency services communities. The fact remains that technology by itself does not win war nor does it respond to every day emergencies or once in a millennium events like September 11, 2001. It is not technology but rather men and women who use that technology who perform the tasks needing to be done be it in war, or at an emergency response incident. In order for those men and women to do their jobs safely, efficiently, and often correctly, they need tools. Not all tools are forged out of steel. Some are concepts and operations systems that...
will allow them to bring control to the chaos whether they respond in war or a disas-
ter. Their primary tool is not a weapon nor is it a fire engine but rather concepts that
have become known as an Incident Management System.

We have proven repeatedly that our military might is likely the best on the planet.
We have both the tactics and the technology that leave other nations envious of our
power, yet the true reason for the United States' military success is not technology
but rather a mission-oriented, goal-driven mind-set. This mind-set is also reflected in
personnel of the emergency services community in the United States and abroad.

While there is no doubt that a good deal of the reason that the United States mili-
tary enjoys such success in the modern world is due to the massive technology at our
disposal. Remember, technology is only a tool in a collective toolbox. Much of that
same technology is used on a daily basis in emergency response activities. The mili-
tary of the 21st Century has had to deal with technological jumps that are unprece-
dented in history. These jumps or leaps have undoubtedly caused many headaches
and unseen problems that to past military leaders were unknown. These same tech-
nological advances have been the cause of similar problems in respect to emergency
response. Modern warfare requires technology to become bigger and better, faster
and stronger. Yet, the warrior on the ground remains the most important part of war.
Technology will allow him to win war with greater speed and ease. Still, in the end,
it is the soldier on the ground fighting and often dying in war. The same is true in
respect to emergency responders. It is not the soldier but the firefighter, the police

Figure 1.2 Command and control
officers and the paramedic that serve their country on the home front. Technology will not and cannot do their jobs for them, yet it allows them to do their jobs better. The men and women of emergency services make up the front line of Homeland Defense.

Many of the “fathers of incident command/management” (use of the plural intentional) had military backgrounds. They could see the obvious and often very unobvious parallels of the needs of their emergency response agencies. They began to mold and modify military command and control structures learned serving their country into systems that would allow their respective agencies to better respond to those needing assistance in times of crisis.

These men first adopted then adapted military command philosophy for use in their day-to-day response activities. This adaptation process was not seamless nor was it an overnight success. To this day it still remains a never-ending process as the modern emergency services community looks to the military for guidance in ever-increasing demands for response to incidents which in the past have not been an issue for their systems. The concepts of both emergency services incident management theory and in military sciences are evolving. Often those evolutions are on similar tracks.

Thus the beginnings of the modern day Incident Management Systems were born almost simultaneously in vastly different areas, for a wide and somewhat diverse set of reasons, but for one common goal, to better serve the needs of the community and to do the job of saving lives and protecting property in better ways.
THE BIRTH OF IMS: FIRECSOPE

When a student of emergency services begins to study emergency management theory, they will quickly see that the real birth of the concept we know today as IMS was also found in the late 1960's in California after devastating wildfires ravaged much of the southern part of that state. The fire service in California, along with other state and local governmental agencies, knew that they had to find ways to overcome a series of repeated events and shortcomings that occurred during these large-scale statewide emergency operations.

The agencies quickly began to identify common failures in their own response to these events specifically when a multitude of agencies responded to the same incident. These shortcomings were seen time and time again in operations. The main ones were:

- There was no answer to the question of "Who is in charge?"
- There was no clearly identifiable incident leader or commander, nor formal protocol or legal statute clarifying the responsibility of such a position at these incidents. Many laws could be cited but none positively had the legal impact necessary to clarify a single person or agency in charge and further it was often subject to varying interpretation based on the perspective of the agency(s) or individual(s) involved.
- Many conflicts arose among fire chiefs, police chiefs and other "in charge" official types at various levels of government in the affected jurisdictions.

Figure 1.4 Large scale wildfire aerial shot showing magnitude
Further complications arose in the multitude of agencies from the federal, state, and a myriad of local and elected officials who seemed to want to have a piece of the "command pie", often without the responsibility.

No attempt at any formal or informal basis was made to form a type of collaborative organizational structure for the purposes at hand.

The established chain of command structures in each agency were rigidly enforced each by their own respective agencies, for a variety of reasons including traditions and turf war issues. There was no way to establish any type of leadership or command ladder using anyone from the various agencies represented regardless of any qualifications for the leadership role.

The use of appropriate span of control was not considered.

Many operations were undertaken with only one leader or supervisor and, due to the inherent complexity or more often than not the sheer danger of the operations being undertaken, required much supervision. The military's use of the platoon system was never considered. On many incidents, companies would freelance. Since there was no one keeping track of who was doing what or where, a catastrophic incident could occur on the response scene since there was no accountability for anyone operating in any capacity.

No interagency operations were made. If such operations did occur between two or more agencies, it was often done on the fly with no real planning or inter-agency integration before undertaking inherently dangerous and often risky operations.

There was no common terminology. Each response group had its own self-evolved professional vocabulary or lingo, including acronyms and the use of "non-words". This not only lead to confusion but in some cases one agency's use of a term, acronym, or other vernacular would be in direct contrast with another agency which could often lead to misunderstandings. Operational level people were put at risk due to these miscommunications or misunderstandings.

There was no joint communications system and no inter-operability was provided. In many cases, communication system incompatibilities were evident. Even where sophisticated, modern communications systems were in place for each agency or each jurisdiction, both areas suffered incompatibilities and agency-or-jurisdiction-specific problems occurred in terms of inter-operability and inter-agency communications. Often the existing systems were technologically incompatible and the use of uncommon terminology was more of an issue jurisdictionally or agency-based. On some incidents, response forces were able to physically "see" one another from a distance, yet had no interagency capability to communicate with them.

There was no formal logistics control in place. A large-scale or complex incident demanded more resources than often was available at a given point in time. There was no way to systematically and appropriately ration resources or equipment any jurisdiction or agency might have at its disposal. Often in post-incident critiques it would be learned that one area of the incident needed a particular resource thought to be unavailable, yet that resource or equipment was in fact
available for use unbeknownst to the agency needing it at the time and therefore operating without said resources needlessly.

California's solution to the question of how to solve these and other problems was a project called “Firefighting Resources of California Organized for Potential Emergencies”, which became better known as FIRECSOPE. FIRECSOPE then developed the Incident Command System (ICS) by way of an interagency task force of local, state, and federal agencies.

In the history of FIRECSOPE, it is stated that the task of “Designing a standardized emergency management system to remedy the problems listed above took several years and extensive field testing.” This very accurate statement could be followed up with one regarding the ongoing nature of the process and still another regarding the system never being totally refined to any given end point due to the ever changing nature of the environment that emergency responders operate in, not unlike their military counterparts.

The same document further states that early in the Incident Command System development process, four essential requirements became clear:

- The system must be organizationally flexible to meet the needs of incidents of any kind and size.
- Agencies must be able to use the system on a day-to-day basis for routine situations as well as for major emergencies.
- The system must be sufficiently standard to allow personnel from a variety of agencies and diverse geographic locations to rapidly meld into a common management structure.
- The system must be cost-effective.

Once the framework of the system then known as Incident Command System or just Incident Command was laid, the system began to evolve and spread much like the wildfires it was designed to combat in the first place.

Many larger agencies and eventually states themselves began to adopt, refine, and adapt the work done in California for use in their own agencies.

**Evolution of “Big Three” IMS Systems**

As was stated earlier, the birth of the Incident Command System in the early part of the 1970s was a result of a series of fires that taxed the California response community to the point of nearly breaking. Like the invention of a more physical object, the very nature of history tends to focus on the products rather than the true evolutionary development process needed for all such endeavors.

History tells us that the light bulb was “invented” by Thomas Edison in 1879, yet a simple Internet search would show that many prior inventors had a hand in the
development process to the end point of a commercially deployable incandescent light bulb.

The modern day IMS that the emergency services community uses was a functional outgrowth or spin-off of the original Incident Command System, developed for the specific needs of large-scale wildland fires. It became evident to users of that early Incident Command System that the system itself was well suited for use in other emergencies including natural and technological disasters.

Undoubtedly those who assisted in the early expansion of the Incident Command System to include non-wildfire situations were also Californians, as the state seems to have a propensity for all forms of disasters which occur regularly on a large scale if not seemingly daily basis.

The reason for this outgrowth was simple. The emergency management community quickly realized that the underlying problems that led the wildland community to develop the original Incident Command System were also common to other incidents both in terms of complexity and scope.

They were and still are:

- Large spans of control causing too many people to be reporting to one supervisor
- Multiple types of organizational structures among response agencies at a variety of levels of government
- No formal way to reliably share incident information
- Incompatible and inadequate communication systems and procedures
- No formal method of coordinated planning among agencies
- Severe misunderstandings of lines of authority
- Major terminology differences between agencies and response disciplines
- Lack of formal or in some cases unspecified incident objectives
- Lack of any incident action planning or backup plans

Common factors in all disaster or emergency response situations are that they may occur with no advance warning or notice. They may then develop rapidly from an incident as small as a grass fire that can evolve into a major wildland conflagration, or one that may occur almost instantaneously on a wide-scale covering many jurisdictions at once such as an earthquake or tornado.

If left to their own devices unchecked, they may grow in size, proportion, or complexity increasing personal risk for response personnel and civilians who may be affected by the event. The risk of life and property loss can be extremely high.

A great example of this was the wildland fires in Yellowstone National Park. In a single week in the summer of 1988 fires within the park alone encompassed more than nearly 99,000 acres, and by the end of the month, dry fuels and high winds combined to make the large fires nearly uncontrollable. On the worst single day, August 20, 1988, tremendous winds pushed fire across more than 150,000 acres requiring a massive national level response.