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Civil-Military Incident Command: Integrating ICS and C2 to Meet Current Emergency Response Demands

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## ABSTRACT

The Incident Command System (ICS) was developed to address the failure of a unified response in a multi-agency response to wildfires. Since its implementation emergency responders are better trained and have effectively adapted to the complexity of multi-agency response. Recent events such as 9-11, Hurricane Katrina, and the earthquake in Haiti demonstrate the increasing complexity of the nature and effects of today's disasters. The need to include military units in emergency response operations appears to be growing and may become the future standard. A new Civil-Military operations paradigm is defined but not yet fully developed into an efficient and effective multi-agency response team. This paper will explicate research that utilizes lessons learned and current theory to develop an improved ICS model that integrates the current civil ICS with the military Command and Control (C2) system. The model will provide the framework for a unified multi-agency emergency response to meet the future challenges facing the United States.

## Keywords

Incident Command System (ICS), Command and Control (C2), Civil-Military ICS

## INTRODUCTION

### ICS - Historical Perspective

The Incident Command System (ICS) was developed as a result of the tragic 1970 wildland fire season in Southern California (FIRESCOPE, 1988). Evaluation of the fire operations in response to these fires revealed ineffective communications and control across the multi-agency response efforts. In an effort to improve multi-agency response to future wildland fires, the United States Congress chartered the Firefighting Resources of California Organized for Potential Emergencies (FIRESCOPE, 1988). Some of the problems which FIRESCOPE identified were unclear lines of authority, inadequate and incompatible communications, lack of structure for coordinated planning among agencies, and different agency response organizational structures. FIRESCOPE identified five major program components from which a two component FIRESCOPE system was developed.

5 Initial Program Components	FIRESCOPE SYSTEM
<ul style="list-style-type: none"><li>• Coordinate multi-agency resources during major incidents.</li><li>• Develop improved methods for forecasting fire behavior.</li><li>• Develop standard terminology.</li><li>• Provide multi-agency communications.</li><li>• Provide multi-agency training.</li></ul>	<ul style="list-style-type: none"><li>• INCIDENT COMMAND SYSTEM (ICS)</li><li>• MULTI-AGENCY COORDINATION SYSTEM (MACS)</li></ul>

Figure 1: The Birth of ICS – THE FIRESCOPE PROGRAM

The FIRESCOPE System continued to be reviewed and improved throughout the 1970's and became the standard throughout Southern California.

Because of the success of the FIRESCOPE program government officials transitioned it into a national ICS program in 1982. The program was called the National Inter-Agency Incident Management System (NIIMS). NIIMS was tested, reviewed and improved as it was applied to emergency response and to training exercises. NIIMS was renamed and called the Incident Command System but it wasn't until 2003 that the ICS became a national standard. Homeland Security Presidential Directive/HSPD-5 established a National Incident Management System (NIMS) of which ICS is a critical part (HSPD-5 2003). NIMS continues to provide the ICS platform that unites federal, state, and local agencies in an all-hazards approach to incident planning and response.

### **ICS – Purpose**

The ICS is designed to be used in response to incidents that range from routine to complex and for both natural and manmade (FEMA, ICS). The system is also designed for use by federal, state, local, and private sector responders. What makes the ICS so adaptive and responsive within the range of incidents and organizations is its structural flexibility. The ICS can be as small in organization structure as needed, expand to incorporate a larger organizational structure when and if needed, and then shrink in size when the situation moves back toward normality.

The Incident Command System incorporates five major functional areas: Command, Operations, Planning, Logistics, and Finance/Administration. As terrorist activities within the United States has increased a sixth functional area has been added: Intelligence/Investigations. The structure of the ICS is modular and is developed around the incident from top down and begins with Incident Command. The size and scope of the incident dictates the expansion to other functional areas. A common use of the functional areas is to begin with Incident Command, expand to include Operations once multiple agencies are required, followed by return to Incident Command when operations become less demanding.

### **ICS – Current Status and Use**

Incident response is a primary function of all police, fire and EMS personnel, first responders. Every first responder, paid or volunteer is required to attend ICS training. The training courses range from introduction through leadership and are taken in series as responsibility and authority are increased. This training requirement ensures that every first responder is able to perform within the full spectrum of response activities.

The majority of all incidents which require response from these types of agencies are simple in nature and require minimal ICS structure. For those incidents which expand in complexity or began more complex, the first responders exercise the structural adaptability of the ICS and instinctively establish incident command. These incidents could range from multi-vehicle multi-injury motor vehicle accidents to multi-alarm structural fires. The adaptable nature

of the ICS provides each first responder with the knowledge and confidence needed to function within the ICS during a multi-agency major catastrophic event.

Along with the everyday use of the ICS, NIMS requires that every public organization develop a plan to continually improve its performance throughout the four phases of emergency management, Prevention/Mitigation, Preparedness, Response, and Recovery. Implementing this plan requires developing an emergency response plan, testing the plan against scenario driven simulations, and using the results of the simulation to improve the plan. Continually exercising the emergency response plan promotes effective use of the ICs and a more efficient response to future events.

One of the most significant problems that ICS addressed was that during multi-agency incident response each agency would provide their own commander (Haddow). Multi-agency response is more coordinated since the inception of ICS. Leadership throughout the ICS structure has better situational awareness and response personnel have clear lines of authority. This was not accomplished quickly. Success came when organizations accepted support roles in order to work within the ICS structure. Training, practice, and actual incident response demonstrated that the ICS provided the framework to unite multiple agencies in an effort to manage the effects of the disaster more efficiently and effectively.

### **ICS - Military**

Several incidents occurring within the United States have required support of the United States military. Hurricane Katrina is arguably the most documented disaster in recent history which utilized both United States military and National Guard resources. Landfall occurred at approximately 0600 hours and search-and-rescue operations began by mid-afternoon. Among the responders were the United States Coast Guard and the Louisiana National Guard (Haddow, 2008). At that time the state and local communication systems had become inoperative which prevented a coordinated air/ground rescue operation. The air rescue operation was continued in an uncoordinated manner with no air to ground communication. This operation is reminiscent of the response to the wildfires which prompted the development of the ICS; multi-agency response with minimal communication outside of individual command structures.

United States military personnel are familiar with emergency response systems. The Civil Military Operations Center (CMOC) is a military version of an Emergency Operations Center (EOC). The CMOC is the point of interface between U.S. armed forces and indigenous civilian governments and populations, other U.S. government organizations, International organizations (IOs), non-government organizations (NGOs), and private volunteer organizations (PVOs) (Wilkins) (Federation of American Scientists). In this system the civilian population provides support to the military. This model works well when responding to countries which do not have emergency action plans or incident command systems.

The United States is currently operating at least one CMOC in Operation *Unified Response*, the response to the devastating earthquake in Haiti. The CMOC originated during Operation *Provide Comfort*, the 1991 operation which provided humanitarian assistance to the northern Iraqi Kurds. The CMOC also was in use during Operations *Restore Hope* in Somalia,

*Support Hope* in Rwanda, and *Uphold Democracy* in Haiti (Wilkins). There is no doubt that the CMOC has and will continue to unify and positively impact the response efforts of multi-national disasters.

The CMOC is an EOC that is operated by the U.S. military which coordinates the civilian support for an emergency response. In the United States there exists a National Incident Management System (NIMS) (US DHS). This system operates on a premise that all incidents begin and end locally. Use of the United States military for an incident within the United States would most likely be in a support role. Will the advent of the CMOC adversely affect the military's ability to function in support of a NIMS response?

Support for the civil operation should not be a difficult transition for military organizations or personnel. Support is a common theme throughout the military. U.S. Army and U.S. Air Force bases are virtually co-located as the Army depends on the support of the Air Force for transport. In support of the U.S. Marines the U.S. Navy transports Marine personnel throughout the world for deployment into a theater of operations. The U.S. Marines are designed around support for the marine riflemen. Will this supporting role experience effectively translate in equal support of civil operations?

Most of the military support functions have long histories and are part of the standard operating procedures. A new Civil-Military operations paradigm, where the military supports civil operations, is defined but not yet fully developed into an efficient and effective multi-agency response effort. Historically changes of this nature only occur after great tragedy. We do not have to wait for the next great tragedy as the basis for development of the Civil-Military Incident Response System (CMIRS) can be found in past tragedies.

As previously discussed, the ICS was developed after an ineffective response to fires in Southern California. FIRESCOPE was not the first organization to evaluate their response efforts and make positive change. In 1949, thirteen fire fighters died in the Mann Gulch fire disaster (Weick). One of the most important outcomes of the evaluation was the training that the Forest Service developed for all incoming fire fighters. The newly hired fire fighters were trained in escape tactics such as building escape fires, knowledge of fire tendencies, and crew safety takes precedence over fire suppression.

ICS training is the basis for the success of in emergency response. ICS training will also serve as the basis for implementing the CMIRS. However, training alone will not guarantee successful implementation of the CMIRS. Application must follow. Turoff, et al, in their Design of a Dynamic Emergency Response Management Information System (DERMIS) paper, wrote the following:

Premise 1 – System Training and Simulation: An emergency system that is not used on a regular basis before and emergency will ever be of use in an actual emergency (Turoff). Military personnel must be involved in civil emergency response drills and simulations.

## Civil/Military – Civil Military Incident Response System (CMIRS)

There is clearly a trend and a need to utilize National Guard and U.S. military forces in response to disasters in the United States. National Guard and Military forces are accustomed to operating in a support environment and receiving training and practice before performing in the combat theater. Responding to emergency incidents within the United States will require similar training to prepare National Guard and Military personnel for service in the civil emergency response environment.

The Civil-Military Incident Response System will consist of the following three phases:

1. FEMA Training
2. Joint State Response Training System (JSRTS)
3. Participation in disaster drills, table tops, and exercises.

### FEMA Training

There is no need to invent or develop a new training program as FEMA's program has been a crucial part of the success of the ICS. Every civil emergency responder is required to take and pass FEMA training commensurate with their response authority and responsibility. The following chart depicts a typical training cycle for civil responders.

Course Number	Course Name	Course Description
IS-100	Introduction to the Incident Command System	ICS 100, Introduction to the Incident Command System, introduces the Incident Command System (ICS) and provides the foundation for higher level ICS training. This course describes the history, features and principles, and organizational structure of the Incident Command System. It also explains the relationship between ICS and the National Incident Management System (NIMS) (FEMA IS-100).
IS-200	ICS for Single Resources and Initial Action Incidents	ICS 200 is designed to enable personnel to operate efficiently during an incident or event within the Incident Command System (ICS). ICS-200 provides training on and resources for personnel who are likely to assume a supervisory position within the ICS (FEMA IS-200).
IS-300	ICS for Mid-Level Managers	ICS 300 is designed to train mid-level managers in transfer of command, staffing and organization, unified command, resource management, forms, and interagency mission planning (FEMA IS-300).
IS-400	ICS for Command and General Staff	ICS 400 is designed to train persons who will serve as command and general staff. Topics include command and general staff, deputies and assistance, unified command, and organizational relationships (FEMA IS-400).
IS-700	NIMS an Introduction	This course introduces and overviews the National Incident Management System (NIMS). NIMS

IS-700 cont.		provides a consistent nationwide template to enable all government, private-sector, and nongovernmental organizations to work together during domestic incidents (FEMA IS-700).
IS-800	An Introduction to the National Response Framework	The course introduces participants to the concepts and principles of the National Response Framework (FEMA IS-800).

Table 2. FEMA Training Courses

These FEMA training courses are essential to understanding the response environment in the United States. One of the most important threads that are maintained throughout the training is the use of common terminology. Common terminology enables multiple agencies to work together and collaborate more effectively. One aspect of the ICS, unity of command, is a military standard and therefore should be easily grasped by military personnel. The courses will give the military responder the necessary knowledge to begin functioning within the civil response environment and the following table correlates ICS training with military rank structure.

Course Number	Course Name	Military Rank Equivalent
IS-100	Introduction to the Incident Command System	All Ranks
IS-200	ICS for Single Resources and Initial Action Incidents	All Ranks
IS-300	ICS for Mid-Level Managers	NCO/Officer
IS-400	ICS for Command and General Staff	Officer
IS-700	NIMS an Introduction	NCO/Officer
IS-800	An Introduction to the National Response Framework	NCO/Officer

Table 3. FEMA Training for Military Ranks

IS-100 is the introductory course which will provide all military personnel with a foundation of the principles and organizational structure of the ICS. This course will also introduce the common ICS terminology. Although IS-200 is designed for personnel who are likely to assume supervisory roles, I believe it is essential for all military personnel because of the nature of the military rank structure. Even the lowest ranked person of a unit needs the capability to step into the next rank should they be needed. The operational nature of IS-200 will prepare personnel for this movement.

Non Commissioned Officers (NCO) are the mid-level managers of the military. They will likely be the personnel to assume command of certain event operations. They may also have to transfer command to either higher ranking officers or back to public safety officers. The IS-300 training is essential and will prepare the NCO to better understand the staffing, ICS forms, resource management, and interagency mission planning. The NCO will likely be involved with a unified command (UC) structure especially at the event site and this course will provide the requisite knowledge in UC.

Officers likely serve in command and general staff positions therefore officer should receive training in both IS-300 and IS-400. IS-300 will provide the officers with knowledge of the varied aspects of the command structure and planning processes. It will also provide the requisite knowledge of what they can expect from their NCOs. IS-400 will build on the preceding course and provide a more detailed perspective of the command structure. It will prepare officers for command in the EOC or in the field in positions such as Operations Chief or as part of a UC.

IS-700 and IS-800 are courses in NIMS and the National Response Framework (NRF). These courses will provide NCOs and officers with knowledge on working with nongovernmental organizations (NGO), private sector organizations, and all governmental agencies. These are essential topics for military personnel to master as they assume leadership roles in incident response.

### **Joint State Response Training System (JSRTS)**

The JSRTS is a local-to national virtual architecture for training, collaboration, and education. Focused on the preparation of National Guard personnel for domestic contingencies, JSRTS also provides a variety of groundbreaking capabilities that span government, including virtual collaborative workspaces, integrated virtual individual and staff training, powerful map-based emergency management data leveraging, and a host of educational opportunities for National Guard and civilian personnel (National Guard Bureau).

Utilizing this unique virtual simulation program will enable trained personnel to apply what they have learned in FEMA training to controlled emergency response simulations. Personnel are able to participate in a variety of roles thereby experiencing multiple levels of responsibility and authority. Researchers at the New Jersey Institute of Technology (NJIT) are currently working with National Guard personnel to produce a final program that will provide a complete civil-military emergency response training environment. JSRTS is a perfect environment where civilian and military personnel can collaborate in a unified emergency response effort.

### **Participation in Disaster Drills, Tabletops, and Exercises**

Participation by military personnel in civil disaster drills and exercises may be the most difficult aspect of implementing CMIRS. It is however the most critical as in order for this civil/military unified response to be effective the personnel must train together. The response to Hurricane Katrina by the National Guard and the United States Coast Guard revealed the consequences of operating without a collaborative environment. Air rescue operations began just ten hours after the hurricane made landfall at the Louisiana coast. Although victims were taken from flooded areas, they were not delivered to safe facilities because there was no unified rescue program in place. Collaboration between civil and military entities was non-existent. In order to build a unified civil/military emergency response team we must develop a collaborative civil/military environment.

Utilization of the JSRTS by both civilian and military personnel in collaborative environments may be the essential element to help bridge this relationship gap. With increased use and acceptance along with preparing military personnel for civil emergency response it will also provide essential continuing preparation of both civil and military personnel.

Personnel cannot be confined to the JSRTS. It appears that National Guard and U.S. military personnel are being afforded access to drills and exercises already. A recent tabletop exercise that simulated a large scale disaster included in its participant list personnel from the National Guard, U.S. Marine Corps, U.S. Army, and the U.S. Air Force. It did appear that neither civil nor military personnel knew what role military personnel have in the response effort. This is understandable and illustrates the need for the CMIRS.

### **Civil-Military Incident Response System – Impediments to Success**

The need for, or the development of any program is a guarantee that the program will be accepted. Even when programs are accepted they sometimes are never implemented. We have identified several impediments that will adversely impact the desired behavioral change that CMIRS was designed to affect. Addressing these impediments during the planning and development stages of the CMIRS will help to increase the chance of success.

1. Failure to train military personnel in ICS.
2. Failure to create a collaborative civil-military environment.
3. Will the military experts be able to function in a supporting role under the command of a non-subject matter expert?
4. Can the less qualified civil manager deploy military experts with effectiveness and without bias?
5. Failure to implement all three phases of the CMIRS.
6. Can military personnel who are moving from a robust C2 system and operations environment to a less robust C2 and operations environment?

Failing to train military personnel in the ICS will allow the current process of the military pushing to be utilized and the civil rejecting their requests to continue. Military personnel must be able to communicate with civil personnel in a common standardized language. They must also understand the command structure and become better acquainted with the process of emergency response. This is not unlike the training a civilian undertakes when entering the military. The civilian learns new processes, command structure, and lexicon.

The collaborative environment may be the most difficult impediment to overcome. Two separate and distinct cultures must come together in a manner which places the opposite culture on equal standing with their own. The civilian culture may also see the acceptance of military personnel as a failure to adequately prepare for future incident response requirements. We must understand that with increasing complexity comes a greater demand for expertise. We must also understand that the military provide support expertise that will provide a more effective and efficient incident response. The response to hurricane Katrina demonstrated that the military, if

utilized sooner, could have positively impacted the police response and prevented both loss of life and property.

Military personnel are trained experts who have extensive expertise in their respective fields. They operate in units where superiors generally have more training and experience than their subordinates. While in the Marine Corps I worked for, and supervised, personnel that all trained in the same operational specialty and became subject matter experts. Military personnel providing support for civil incident response may find themselves under the command of non-subject matter experts. The FEMA ICS training program addresses this indirectly and continued work during the second and third phases of the CMIRS should create a team environment where civil and military develop a mutual respect.

The expertise of military personnel may adversely affect civil commanders. Civil commanders may feel inferior in knowledge and skill and therefore attempt to overcome this inferiority with bias. Utilizing any bias in response assignments where experts are improperly placed will create less effective and efficient response. The solution to this impediment is similar to the last as the FEMA training and the subsequent practice should create a requisite team environment.

Partial implementing CMIRS will prove more detrimental than not implementing any program at all. Partial implementation will signal the military that they are now included while sending an opposite signal to the civilians that the military is not yet fully trained. A greater divide between the two will not only be detrimental to the response effort but it will also likely increase the response cost. Duplication of efforts and equipment alone can arguably double the cost of the response. A decision to begin training must also be a decision to continue training. Civil incident response is a continuous process of planning, training, and responding only as needed. CMIRS should be implemented in similar manner as NIMS.

*“War is the realm of uncertainty; three quarters of the factors on which action in war is based are wrapped in a fog of greater or lesser uncertainty. . . . The commander must work in a medium which his eyes cannot see; which his best deductive powers cannot always fathom; and with which, because of constant changes, he can rarely become familiar.”* —Carl von Clausewitz (USMC). Managing or participating in a civil incident response is complex but it is not similar to managing a war. The response to the World Trade Center although tragic began as a fire with people trapped. It later became a building collapse. Responders had previously responded to many similar type incidents before. As tragic as this event was, it still is no comparison to war.

The military use of Command and Control (C2) has been refined over centuries of use and developed through years of combat situations (Chumer and Turoff, Command and Control (C2): Adapting the Distributed Military Model for Emergency Response and Emergency Management). Organizations such as the Defense Information System Agency (DISA) are constantly providing technologies that increase the robustness and redundancies of military C2 (DISA). Civilian C2 incorporates several different Incident Management Systems (IMS) throughout the nation; WebEOC and E-Team or two such IMS systems in use. Civil

organizations are also free to incorporate any additional technologies into their C2 that they like. Response to both Katrina and the World Trade Center demonstrated the fragility of civil C2.

Military C2 is replete with sensors, redundancy, and maintains a fully collaborative system throughout all phases of battle. Unlike the fragility of the civilian IMS, the military C2 system is robust. The military C2 is also interoperable throughout the battle area. Military personnel are capable of receiving and transmitting data from infantry to aviation assets to command and back again. In the civilian response theatre collaboration does not exist as users of E-Team can't send messages to users of WebEOC. There is no doubt that civilian C2 is not as robust as military C2.

Military personnel who will be subjected to less robust C2 and a less complex theater of operations may feel under supported and therefore may not function at their full potential. The lack of robustness of civil C2 is not a secret and therefore will be experienced by military personnel throughout their CMIRS development. Military personnel should not only overcome this impediment they also should, based on their expertise, recommend changes to improve civil C2.

More impediments to implementing CMIRS will be realized during this process. Success will come if we develop an attitude of overcoming and not succumbing to the impediments. The civil operations need the expertise of the military personnel and the military personnel must work within the ICS. The Civil-Military operations paradigm has been defined by the complex response requirements associated with today's disasters. This framework fully develops the environment to promote an efficient and effective multi-agency Civil-Military response team.

## **Military C2 – Contributions to ICS**

Alberts defines the purpose of Command and Control as the capacity to bring all available information and all available assets to bear (Alberts). Chumer and Turoff state that command and control is the hub of communication, information technology, and information systems (Chumer and Turoff, Command and Control (C2): Adapting the Distributed Military Model for Emergency Response and Emergency Management). ICS is a set of instructions, guidelines, procedures and forms designed to provide a unified approach to multi-agency response (ICS). IMS architectures are developed for the purpose of Security Systems Monitoring and Response, Emergency Management (EM) and Continuity of Operations (COOP) (CACI). Therefore ICS and IMS must be contained within C2. C2 is the semantic glue that unites the civil and military cultures in a collaborative emergency response environment.

An increase in Emergency Operations Centers (EOC) has created the need for more robust communications capabilities. There has also been a recent increase in information sharing between public and private civil entities. These events have created better situational awareness but information and communication systems are still not capable of providing real-time shared awareness. Achieving real-time shared awareness for civil emergency response will increase the efficiency and effectiveness of the response. It should also reduce the incident response cost. C2 contains robust communication and information systems that may be able to be leveraged for use in the civil response environment.

The Sense-and Respond Enterprise paradigm is currently being researched at New Jersey Institute of Technology (NJIT) for application to emergency management (Menotti). The application, Emergency Response by Wire (ERBW) is attempting to leverage Sense-and-Respond or Adaptive Enterprise principles as a means to create a more adaptive EOC (Chumer, Emergency Response by Wire), (Menotti). The principles were developed by Steve Haeckel who researched complexity theory and Russell Ackoff's work in general systems theory (Menotti). Much of the technology that would make emergency management more adaptive is contained in military C2.

In order for emergency management to become more adaptive or to build a sense-and-respond organization, sense making needs to improve. Not sense making about what has happened but sense making of impending failures, shortfalls, and events. Sensors that currently feed military sense making operations can be adapted for use in the civil emergency response environment. Acoustic, pressure, and temperature sensors are just some of the technologies that would provide additional sense making ability. Sensor technology is receiving some limited use in civil emergency response but not enough to create a sense-and-respond organization.

Reach back capabilities in military C2 are robust and redundant. Not so for the civil emergency response environment. Live video and photo transmission are limited in civil response and the supporting infrastructure has no built in redundancies. This could render the infrastructure inoperative by a single event. Military reach back technologies and personnel can be leveraged to provide the needed technology and training to restructure the existing reach back capabilities to be more robust in structure and function. Enriching the reach back ability of civil emergency response would also provide valuable support for an ERBW organization.

There have been recent advancements in the collaboration between public and private incident response organizations. NJIT has been operating a Business Emergency Operations Center (BEOC) with an alliance to the New Jersey Business Force (New Jersey Business Force) (BEOC). The BEOC and the NJBF have worked diligently with state, county, local, and private entities to develop this collaborative information sharing environment. In 2010, the BEOC began receiving and distributing information from the state EOC. The CMOC, the military version of the EOC, has utilized lessons learned from some major operations to positively change the manner in which the center is operated (Menotti). CMOC lessons learned may provide valuable information for BEOC operation and information sharing. A meeting of personnel from each entity could exchange experiences and lessons learned in the development of their respective programs.

## **Conclusion**

The ICS was developed for and has proven successful in enabling a multi-agency and multi-jurisdictional response to complex emergency events. Emergency response has largely been a job for the nation's public sector organizations such as police, fire, and EMS. Recently, we have begun to see need for and the use of National Guard, and military units. The disaster response to Hurricane Katrina revealed the need for military support as well as the difficulty in establishing a coordinated response between the public sector and military units.

The use of military units in emergency response is on the rise and as disasters become more complex the need to deploy military units will likely increase. Just as public sector organizations have developed a unified approach to emergency response so to must the military become part of that type of approach. This collaborative approach was fostered through the implementation of the ICS across the public sector agencies. Public sector agencies have been trained in ICS, participated in drills, and have proven the success of ICS in actual emergency response.

Military personnel are being called to support US emergency response efforts and have no knowledge of how to interact with their civilian emergency responders. Emergency response efforts should be coordinated and collaborative. In order to maintain this type of response military personnel must be trained in ICS. FEMA has provided the essential building blocks to public sector responders and military personnel should also attend this training.

CMIRS is a program which will provide the necessary training for military personnel in ICS. This program will introduce military personnel to ICS and also provide additional training using the JSRTS. The JSRTR will enable military personnel to put their training into use in a computer based emergency response simulated exercise. After completion of the training and exercises the personnel will be better able to participate in cooperative live drills with public sector responders. Continued training and exercising will help to establish the working relationship between military personnel and public sector responders that will enable the cooperative environment needed to effectively respond to national disasters.

There needs to be continued research in the area of developing metrics to determine the success of the training. The research should include the ability to improve the training. More in depth research needs to be completed with respect to military C2 applications to public sector response.

## References

1. Alberts, David s., Hayes, Richard E. Understanding Command and Control. Research Document. Washington DC: CCRP, 2006.
2. BEOC, NJIT. Business emergency Operations Center (BEOC). Concept Overview. Newark: NJIT, 2009.
3. CACI. Incident Management System Technologies. White Paper. Eatontown: CACI, 2004.
4. Chumer, Michael and Murray Turoff. Command and Control (C2): Adapting the Distributed Military Model for Emergency Response and Emergency Management. Research. Newark: NJIT, n.d.
5. Chumer, Michael. "Emergency Response by Wire (ERBW)." CHI. Florence, 2008. 1-10.
6. DISA. Year in Review. Technology Review. Fort Meade: Defense Information System Agency, 2007.
7. Federation of American Scientists. Civil Military Operations Center. WWW: FAS, 1999.
8. FEMA IS-100. IS-100. Fact Sheet. Washington DC: FEMA, n.d.
9. FEMA IS-200. IS-200. Fact Sheet. Washington DC: FEMA, n.d.
10. FEMA IS-300. IS-300. Fact Sheet. Washington DC: FEMA, n.d.
11. FEMA IS-400. IS-400. Fact Sheet. Washington DC: FEMA, n.d.
12. FEMA IS-700. IS-700. Fact Sheet. Washington DC: FEMA, n.d.
13. FEMA IS-800. IS-800. Fact Sheet. Washington DC: FEMA, n.d.
14. FIRESCOPE 1988. "A Progress Report: Firefighting Resources of California Organized for Potential Emergencies." Progress Report. 1988.
15. Haddow, Bullock and Coppola. Introduction to Emergency Management 3rd Edition. NY: Elsevier, 2008.
16. HSPD-5. HSPD-5. Directive. Washington D.C.: United States President, 2003.
17. ICS, FEMA. Incident Command System (ICS) Overview. Advisory. Washington D.C.: FEMA, n.d.
18. Menotti, Mark J. "The Sense-and-Respond Enterprise." Operations Research / Management Sciences Today (2004).
19. National Guard Bureau. Joint State Response Training System. www. washington DC: National Guard Bureau, 2009.
20. New Jersey Business Force. NJBF - BEOC Alliance. Presentation. Newark: New Jersey Institute of Technology, 2010.
21. Turoff, Murray., Chumer, Michael., Van de Walle, Bartel., Yao, Xiang. "The Design of a Dynamic Emergency Response Management Information System (DERMIS)." Journal of Information Technology Theory and Application (2004): 1-35.
22. US DHS. National Incident Management System. Overview. Washington DC: FEMA, 2008.
23. USMC. MCDP-6 - Command and Control. Doctrine. Washington DC: United States Marine Corps, 1996.
24. Weick, Karl E. "The Collapse of Sensemaking in Organizations: The MAnn Gulch Disasater." Administrative Science Quarterly (1993): 628 - 652.
25. Wilkins, Aaron L. The Civil Military Operations Center (CMOC) In Operation Uphold Democracy (Haiti). Thesis. Montgomery: ACSC, 1997.

**Civil-Military Incident  
Command: Integrating ICS  
and C2 to Meet Current  
Emergency Response Demands**

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# Introduction

- **Incident Command System**
- **ICS and the Military**
- **Civil Military Operations Center - CMOC**
- **Civil Military Incident Response System**

# Incident Command System - ICS

- **Historical Perspective**
  - **FIRESCOPE -1988**
  - **Multi-Agency Response Failure**
  - **Coordinate, Improved Methods, Standard Terminology, Multi-Agency Comm., and Multi-Agency Training**
- **Purpose**
  - **Modular, Expandable, Adaptive Organizational Structure**
- **Current Status and Use**
  - **National Standard throughout Public Sector**
  - **Training, Practice, and Continual Emergency Response Plan Improvement**

# ICS and the Military

- **Hurricane Katrina**
- **Military Air Operation Began +10**
- **No Communication Structure**
- **Reminiscent of the Wildfire Response Which Prompted FIRESCOPE.**

# CMOC

- **Military Version of an Emergency Operations Center**
- **EOC's are Support Organizations**
- **EOC's Primarily Provide Resource Management.**
- **They are not command organizations.**

# Civil Military Incident Response System

- **FEMA Training**
  - IS 100 – IS 800
  - <http://training.fema.gov/is/>
- **Joint State Response Training System**
  - National Guard Bureau
  - Virtual Incident Response Simulations
- **Drills, Exercises, and Planning**
  - Local, Regional, and National

# Impediments to Success

- **Failure to Train Military in ICS**
- **Failure to Create a Collaborative Civil-Military Environment**
- **Failure to Implement All Three Phases of CMIRS**
- **Failure to Develop a Shared Dependency**

# **Military Contributions to ICS**

- **Command and Control**
  - **Process, Function, and Organization**
- **Sense-and Respond Technology**
  - **Sense Early and Respond Quickly**
- **Reach Back Capabilities**

# Conclusions

- **Military use in National Disaster response has become necessary.**
- **Training all personnel to operate within the ICS framework is essential.**
- **Creating a collaborative training environment will create a more effective multi-agency response.**
- **Military expertise is invaluable to the future of incident response.**