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The next generation of emergency management : proposal for a new model of emergency operations center for a growing regional emergency management system

John D. Eggleston

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THE NEXT GENERATION OF EMERGENCY MANAGEMENT: PROPOSAL FOR A NEW MODEL OF EMERGENCY OPERATIONS CENTER FOR A GROWING, REGIONAL EMERGENCY MANAGEMENT SYSTEM.

BY

John D. Eggleston, B.B.A.

A Thesis

Submitted to the Graduate Faculty

of the University of Richmond

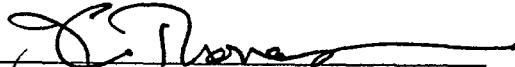in Candidacy

for the degree of

MASTER OF SCIENCE
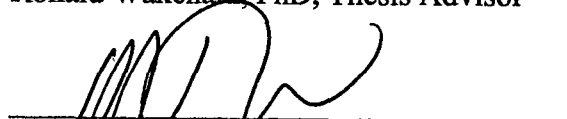
in

Disaster Science

May, 2007

Dr. Jan Thomas

I certify that I have read this thesis and find that, in scope and quality, it satisfies the requirements for the degree of Master of Disaster Science.

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May, 2007

Richmond, Virginia

To Heather

The greatest enemy of communication is the illusion that it has taken place.
Pierre Martineau. *Tsunami Warning Systems and Procedures: Guidance for Local Officials*

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ILLUSTRATIONS

ACKNOWLEGEMENTS

LIST OF ABBREVIATIONS

CAC   Curriculum Advisory Committee

CAUVA   Charlottesville/Albemarle/University of Virginia

EOC   Emergency operations center

ESF   Emergency support functions

IAP   Incident Action Plan

ICS   Incident command system

MAC   Multi-Agency Coordination

NIMS   National incident management system

GLOSSARY

After-Action Report. A report consisting of summary joint universal lessons learned. The
report describes a actual event or training exercise and identifies significant lessons learned.

Benchmarking/Best Practice. Process used in management and particularly strategic
management, in which organizations evaluate various aspects of their processes in relation to best practice,
usually within their own sector.

Emergency Support Functions. Functions that are primarily responsible to prevent,
minimize, and repair injury and damage resulting from emergencies, energy
emergencies, disasters, or the imminent threat thereof, of manmade or natural
origin.

EOC model. The diagram of the organizations the defined the way in which
the emergency operations center's activities are divided, organized, and
coordinated.

Incident Action Plan. The plan developed at the field response level which contains
objectives reflecting the overall incident strategy and specific tactical actions and supporting information
for the next operational period. The plan may be oral or written.

Incident Commander. The individual responsible for the command functions at the field
response level.

Multi-Agency Coordination. The participation of agencies and disciplines involved at any
level of the organization working together in a coordinated effort to facilitate
decisions for overall emergency response activities, including the sharing of critical
resources and the prioritization of incidents.

National Response Plan. The national plan to respond to national emergencies such as
terrorist attacks, natural disasters or emergency. Within the United States natural
disaster response and planning is first and foremost a local government
responsibility.

Section. The organizational level having responsibility for a major functional area of incident
management, e.g., Operations, Planning, Logistics, Finance, and Administration.

ABSTRACT

The emergency operations center organizational model used by the Charlottesville/Albemarle/University of Virginia (CAUVA) Emergency Management Agency is organized around the various departments that staff the center. The EOC model has been used to coordinate small scale natural disasters and training exercises, but has never been used to coordinate a significant actual event. After-action reports of previous events and exercises have highlighted several functional deficiencies and have led some local and state officials to doubt the model's ability to coordinate a significant event.

How should the EOC organization model in a growing, midsized city-county region be designed? To answer this question, it was important to consider the following supporting questions:

1.   What are recognized EOC organizational models?

2.   What is the current EOC organizational model used by the CAUVA Emergency Management Agency?

3.   Which functions supported by the current CAUVA EOC organizational model need improvement?

4.   What EOC organizational models from other like-sized Virginia localities are considered best practice?

5.   What components of the best practice models could be adopted by the CAUVA Emergency Management Agency to improve noted deficiencies?

The research process involved a literature and extant document review which discovered that there were four recognized EOC models. A survey of CAUVA EOC staff members was conducted and revealed that eight EOC functions needed improvement. A benchmark study was conducted of like-sized Virginia localities and it was determined that the incident command system/emergency support function (ICS/ESF) EOC model was best the performing model. The final phase involved surveying the same group of CAUVA EOC staff members, presenting them with the list of deficiencies, the current CAUVA and best practice EOC models, and asking participants to choose which best practice components could be adopted to address found deficiencies.

The survey results revealed that the ICS/ESF EOC model was selected to be the model of choice for a growing, midsized city-county region. Although additional plan development and staff training will be required, the ICS/ESF model may prove to be a more effective method to deal with a challenging natural or man-made disaster.

CHAPTER 1

INTRODUCTION

Managing the response and recovery stages of natural or manmade disasters requires the coordination of multiple agencies and most often leads to the activation and staffing of a physical or virtual emergency operations center (EOC) to aide with coordination efforts. In order to ensure that effective coordination takes place within the EOC environment, there must be a defined relationship between various staff members of the organization. One approach to defining the relationships is to outline how the center's activities are divided, grouped, and coordinated (Freeman, Gilbert, and Stoner 1995, 315). Following the process of defining and documenting the relationship among staff members relative to the center's activities yields the agency's EOC organizational model.

The EOC organizational model used by the Charlottesville/Albemarle/University of Virginia (CAUVA) Emergency Management Agency is organized around the various departments that staff the center. The EOC organizational model has been in place since 1993 and has had little modification since (Charlottesville/Albemarle/University of Virginia Emergency Management Agency 2002, A1).

The CAUVA Emergency Management Agency EOC model has been used to coordinate small scale natural disasters and training exercises, but has never been used to coordinate a significant actual event. After-action reports of previous events and exercises have highlighted several functional deficiencies and have led one of the Deputy Emergency Management Coordinators, the Albemarle's Social Services Director, and the Virginia Department of Emergency Management training staff to question the model's ability to handle a significant event.

How should the EOC organization model in a growing, midsized city-county region be designed? To answer this question, it is important to consider the following supporting questions:

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2. What is the current EOC organizational model used by the CAUVA Emergency Management Agency?
3. Which functions supported by the current CAUVA EOC organizational model need improvement?
4. What EOC organizational models from other like-sized Virginia localities are considered best practice?
5. What components of the best practice models could be adopted by the CAUVA Emergency Management Agency to improve noted deficiencies?

CHAPTER 2

BACKGROUND AND SIGNIFCANCE

During colonial times in Virginia, the government created new counties in response to a growing

population and the need to establish easier public access to government services. In 1744, the Virginia General

Assembly divided a portion of Goochland County and created Albemarle County. Albemarle County was named in

honor of William Anne Keppel, Second Earl of Albemarle and titular Governor of Virginia at the time

(Charlottesville Albemarle Convention & Visitors Bureau 2007).

Today, Albemarle County remains an historic county and is comprised of a mixed urban, suburban, and

rural environment. According to the 2006 Albemarle County Community Profile, the County is a community in

transition, growing at a rate of approximately 2.1 percent per year (Albemarle County 2006, 59). The County has a

diverse population of approximately 90,000 citizens and a land area of 725 square miles (United States Census

Bureau 2006). The County has approximately 500 full time local government employees, a FY 06/07 operating

budget of $260 million, and a 5-year capital budget that exceeds $150 million. The combined population in the

Albemarle County/Charlottesville metropolitan area is approximately 120,000 (Albemarle County 2007).

In 1973, the Virginia General Assembly passed the Emergency Services and Disaster Law, Code of

Virginia § 44-146.19. The law requires that the Commonwealth, and each county and city within the

Commonwealth, be responsible for local disaster mitigation, preparedness, response and recovery (Commonwealth

of Virginia, *Code of Virginia* 2006). As a result of the 1973 Emergency Services and Disaster Law, Albemarle

County and Charlottesville City each created its own emergency management organization and emergency

operations plan (Harden 2004).

In an effort to provide efficient and cost-effective emergency management services, the individual

city/county emergency management agencies and the University of Virginia emergency management department

were consolidated on December 3, 1977 to form the Charlottesville/Albemarle/University of Virginia (CAUVA)

Emergency Management Agency. The mission of the CAUVA Emergency Management Agency is to coordinate

emergency management functions for the City of Charlottesville, County of Albemarle, and the grounds of the

University of Virginia (Charlottesville/Albemarle/University of Virginia Emergency Management Agency 2002,

Resolution of Adoption-Albemarle County).

Several senior staff members of the researcher's organization, Albemarle County Department of Fire Rescue, are also staff members of the CAUVA emergency management team and function as staff members at the EOC. The Fire Rescue Chief is assigned to the EOC policy group and is responsible for working with other senior government officials to develop policy and determine strategy to manage the disaster. The Fire Rescue Deputy Chief functions as one of two Deputy Emergency Management Coordinators assigned to aid the policy group, the coordination group, and the emergency services group. The Fire Rescue Assistant Chief of Operations is assigned to the emergency services group and is responsible for coordinating fire rescue field operations, providing event status updates, providing logistical support, and communicating the broad policies and strategies set by the policy group (Charlottesville/Albemarle/University of Virginia Emergency Management Agency 2002, A2).

The interface between Fire Rescue staff members assigned to the emergency services group and the Fire Rescue field staff is well defined for situations involving a single agency incident commander. The Fire Rescue staff member in the center communicates directly with a Fire Rescue incident commander in the field. The other department staff members represented in the emergency services group (City Fire, City Police, County Police, etc.) follow the same type of center-to-field communications process (Charlottesville/Albemarle/University of Virginia Emergency Management Agency 2002, A1).

Although the line of communications between the center and the field is well defined for agency-to-agency communications, there are no policies or guidelines that would help to define the center-to-field interface when a unified command brings together a multiple agency/multiple jurisdictional response. Which EOC staff member or department (City Fire, City Police, and County Police, etc.) would interface with a unified incident command that is established resulting from a multiple agency/multiple jurisdictional response? The agency-to-agency line of communications between the center and the field can also perpetuate parallel management systems whereby multiple incident commanders working at the same incident have multiple lines of communications to their respective agency contact at the EOC. Parallel management systems can cause confusion, duplication of services, and multiple incident action plans (Linstrom 2004).

The Deputy Emergency Management Coordinator, Albemarle's Social Services Director, and the Virginia Department of Emergency Management training staff have questioned the current EOC model's ability to provide a well coordinated line of communications during a large scale event and believe that there is a need for a logistics group and a planning group within the center. The staff members also cite examples of communications problems

among the center's staff and communication problems between the center's staff and the field resources (Eggleston 2005, 5). After-action reports have identified the following issues with the current EOC model: supporting a unified field command, unclear roles and responsibilities among EOC staff members, lack of situational analysis and forecast analysis, and lack of a central logistics section (Oprandy 2006).

CHAPTER 3

LITERATURE REVIEW

Overview of Emergency Operations Centers

Disasters pose a variety of challenges to coordination, including their rapid onset, the variety of participants who must have a voice, existing procedures and practices, and a lack of understanding by participants of their own agency's procedures, much less those of other organizations. The Federal Emergency Management Agency's Incident Command System training module captures these challenges in a quote from a typical local jurisdiction emergency manager, Michael J. Penner of Olathe, Kansas:

> Disasters demand near-instant assemblage of a large cast of players and steamer trunks full of props. Dragged along with this hastily assembled troupe are the burdensome baggage of standard operating procedures, administrative guidelines, and emergency operations plans—each unique to the responding actors and usually not fully understood by any. (Federal Emergency Management Agency 2006, 1)

In order to effectively manage a natural or man-made disaster, there must be a process to coordinate available resources and focus efforts on saving lives, avoiding injury, and minimizing economic loss. One way of managing a disaster is to create a physical or virtual gathering place for key personnel to make vital decisions (Drabek and Evans 2003, 5).

Federal, state, and local governments use EOCs (physical and virtual) as the gathering place to strategically coordinate their response to a natural or man-made event (Federal Emergency Management Agency 2006, 2). Governments have discovered the value of EOCs and overtime, EOCs have become an essential component of the community's all-hazard emergency management program (Federal Emergency Management Agency 1995, 6).

During the response phase to large, complex incidents, the EOC's primary responsibility is to strategically coordinate communications and community-wide resource management in support of field operations (United States Department of Homeland Security 2004, 26). Communities faced with managing resources during and after a man-made or natural disaster are able to improve their ability to centralize and coordinate the flow of information by establishing an EOC (Federal Emergency Management Agency 1995, 7). EOCs are typically organized in the following manner:

1. Modeled around the traditional four groups (policy group, disaster analysis, operations, and resources group)

2. Modeled by functional departments (fire, police, public works, etc.)

3.   Modeled around the incident command system (ICS)

4.   Modeled around the ICS to support the emergency support functions (ESF). (Green 2001, 46)

<u>Overview of the Incident Command System</u>

While the EOC is focused on policy, planning, logistics/resource allocation, and coordination of operations, field operations are managed by an on-scene commander using the incident command system (ICS).

The Incident Command System was developed in the 1970s in response to a number of major wildland fires in California. During a 13 day period, California wildfires killed 16 people, destroyed 700 structures, and burned over one-half million acres. After-action reports found weaknesses in the existing incident management system. Fire service and emergency management leaders gathered to address found weaknesses and their work eventually led to the development of the incident command system (National Wildfire Coordinating Group 1994, 2).

The incident command system was formally adopted in 1971 in California under the Firefighting Resources of California Organized for Potential Emergencies (FIRESCOPE) program (National Wildfire Coordinating Group 1994, 2). In 1993, an Incident Management Consortium completed its first document entitled *Model Procedures Guide for Structural Firefighting*. The consortium's efforts helped to standardize the use of the incident command system among fire rescue agencies (Emergency Management and Command International 2004).

Today, the ICS has become the standard organizational model for command, control, and coordination of a field response and provides the following key advantages (United States Department of Transportation 2006):

- Uses a common language and response culture

- Optimizes combined efforts

- Eliminates duplicative efforts

- Establishes a single command post

- Allows for collective approval of operations, logistics, planning, and finance activities

- Encourages a cooperative response environment

- Allows for shared facilities, reducing response costs, maximizing efficiency, and minimizing communication breakdowns

- Permits responders to develop and implement one consolidated incident action plan

Overview of the National Incident Management System

On February 28, 2003, the President of the United States issued Homeland Security Presidential Directive 5, Management of Domestic Incidents. The purpose of the directive was to charge the Department of Homeland Security with developing a national incident management system to provide a single, comprehensive system for federal, state, tribal, and local governments to use during mitigation, recovery, planning, and response to man-made or natural disasters regardless of size or complexity (Federal Emergency Management Agency, NIMS Compliance Overview 2006).

Throughout the following year, the Department of Homeland Security collaborated with federal, state, and local government officials and representatives to develop a comprehensive National Incident Management System (NIMS). On March 1, 2004, the Department of Homeland Security issued the NIMS.

The NIMS is based on a set of principles, terminology, and organizational processes to achieve effective, efficient, and unified incident management at all levels. To provide the framework for interoperability and compatibility, the NIMS is balanced between flexibility and standardization (United States Department of Homeland Security 2006, 9).

The NIMS standard incident command structures are based on three key organizational systems: the ICS, the Multi-Agency Coordination (MAC) System, and Public Information Systems. The ICS is a standard organizational model for command, control, and coordination of a field response. The Multi-Agency Coordination (MAC) System is a combination of personnel, facilities, equipment, procedures, and communications integrated into a common system with the mission to coordinate and support resources in a multi-agency or multi-jurisdictional environment. The Public Information System is designed to effectively manage public information at an incident, regardless of the size and complexity of the situation or the number of entities involved in the response (Federal Emergency Management Agency, NIMS Compliance Overview 2007).

ICS/EOC Interface Methods

Interaction between the EOC and the incident commander relies on an effective interface that is based on the following key elements: communications, resource needs, situational analysis, local policies, financial requirements, and anticipation of incident escalations (Federal Emergency Management Agency 1995, iii).

The four types of EOC models previously discussed interface differently with field operations. Some models use a less formal field-to-center interface, while others use a more formalized command and control type field-to-center interface. While police, fire, and emergency medical system agencies are accustomed to formalized organizational models and field interfaces, other EOC staff members may not be familiar with formalized models and may oppose a command and control environment (Dilling 1995).

During 1991, an ICS/EOC Curriculum Advisory Committee was formed and met to discuss ICS /EOC interface issues and challenges. The Curriculum Advisory Committee (CAC) was a voluntary committee of emergency management personnel that was tasked with reviewing the current ICS/EOC interface practices and make recommendations to improving the interface methods. The committee agreed on the following actions to help improve the ICS /EOC interface:

1. Use the ICS/EOC interface model as shown in figure 1 with slight changes to EOC terminology.

2. Define the roles and responsibilities of the EOC and ICS and clearly define the linkage between the two.

3. Develop and implementation a marketing plan. Detail the plans for a product document, market the test model, and reconvene the committee at a later date to analyze the results (Federal Emergency Management Agency 1991).

Figure 1. CAC Recommended ICS/EOC interface model
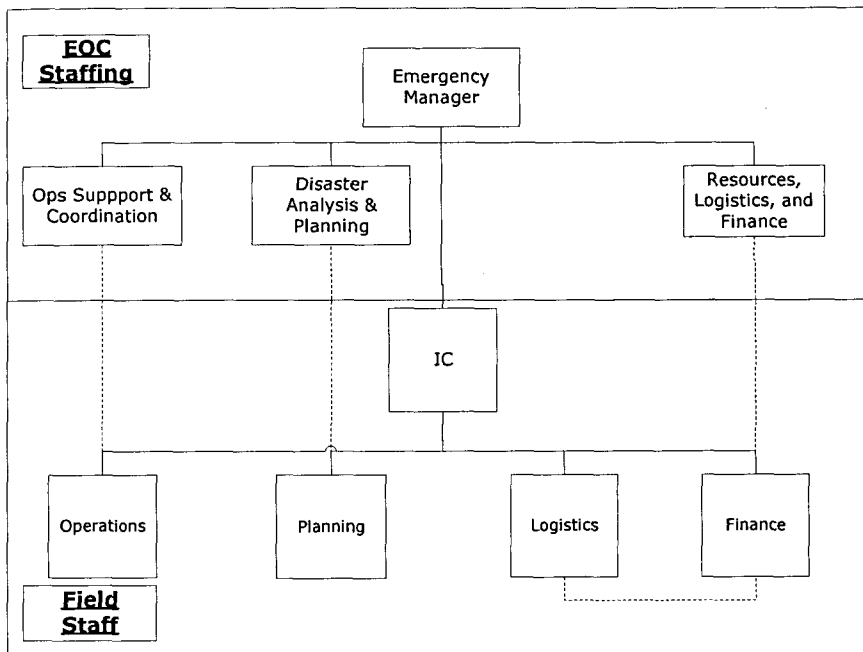
Recognized EOC Models and Field Interfaces

Traditional Four Group EOC Model

The traditional four group emergency operations model is made up of the policy group, disaster analysis group, operations group, and resources group. The policy group provides executive direction and guidance in matters of local policy and provides official information and instructions to the public. The disaster analysis group collects and analyzes data, interprets and predicts natural/man-made disaster damage, and interprets for the EOC staff the actual or potential impact of the disaster on emergency operations. The resources group plans for and provides human and physical resources for the EOC and operations (The Louis Berger Group 2004, A-3).

The operations group within the EOC is responsible for coordinating field operations by prioritizing, directing, and controlling the available response resources. The operations group would interface directly with the incident commander(s) in the field. An example of a traditional four group organizational model is listed below in figure 2 (The Louis Berger Group 2004, A-5).

Figure 2. Traditional four group EOC model

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│  │  EOC  │              ┌──────────────────┐                      │
│  └───────┘              │ Chief Executive  │                      │
│         ┌───────────────┤                  │                      │
│   ┌─────────────────┐   └──────────────────┘                      │
│   │  Policy Group   │        ┌──────────────┐  ┌──────────────┐   │
│   │ Executive Heads │        │  Emergency   │  │ Staff Support│   │
│   │ Department Heads│        │  Manager/    │──│              │   │
│   └─────────────────┘        │  Director    │  └──────────────┘   │
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│   │  Disaster   │   │              │   │              │           │
│   │ Analysis &  │   │  Operatons   │   │  Resources   │           │
│   │ Coordination│   │              │   │              │           │
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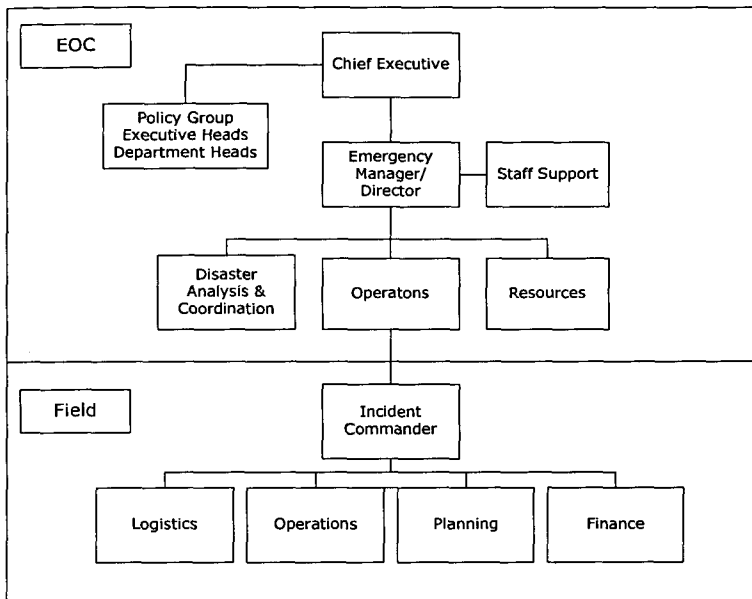
Department EOC Model

Some localities choose to organize their EOC by departments (fire, police, EMS, public works, etc.). Green states that the department model is a simple model to understand because from a staff's perspective, gathering departments at the EOC is similar to a normal staff meeting. When issues arise during an emergency, the issue is qualified and handed off to the department that would normally handle the situation during non-emergency times (Green 2001, 47). The Direction and Control section of the emergency operations plan template for localities that is available from the Virginia Department of Emergency Management outlines an EOC organizational model that is designed around departments (Eggleston 2001, 12). The Direction and Control section of the emergency operations plan defines the various roles and responsibilities for EOC staff and is used to help qualify requests or issues so that the appropriate department is assigned the task for resolution. When first developed in 1993, the EOC model used by the CAUVA Emergency Management Agency was organized around departments and a policy section was later added, exact date unknown (Charlottesville/Albemarle/University of Virginia Emergency Operations Agency 2002).

The field interface for the department organizational model is rather straight forward. Each department within the EOC is responsible for coordinating their field resources. An example department organizational model is listed in figure 3.

Figure 3. Department EOC model

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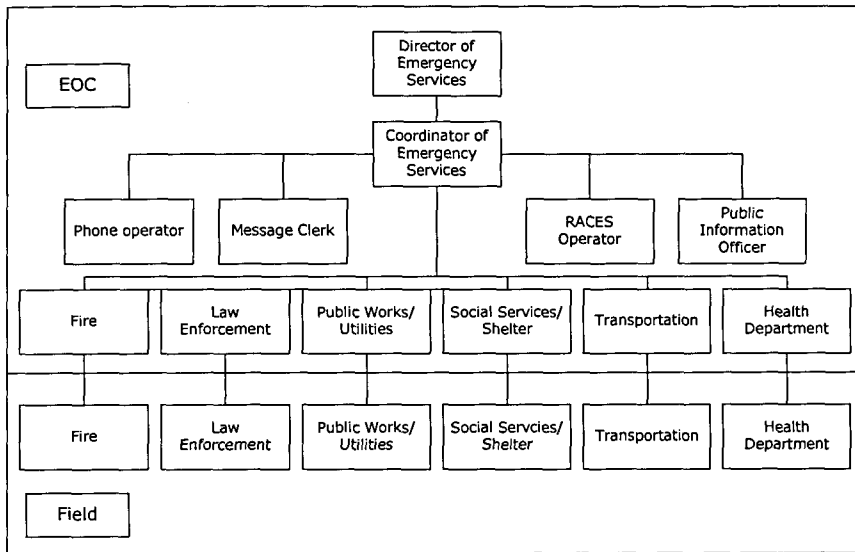
ICS EOC Model

Some localities structure their EOC after the incident command system. In a study of 19 localities with populations between 50,000 and 100,000, Shirey found that the most common incident command components used were policy, city/county manager, EOC manager, operations, planning, logistics, finance, public information officer, and safety. The policy function works with the chief executive to establish broad policies and strategies. The emergency management director oversees the logistics, planning, operations, and finance positions and ensures that the broad policies/strategies are communicated (1997).

The support staff incorporates the public information and safety officer positions. The public information position is responsible for communicating to the media and general public. The safety officer is responsible for developing the event safety plan and addressing any issues related to the responder's safety.

The logistics position is responsible for providing facilities, services, and materials and participates in the development and implementation of the incident action plan (IAP). The planning position is responsible for the collection, evaluation, dissemination and use of information about the development of the incident and the status of resources.

The finance position is responsible for all financial, administrative, and cost analysis aspects of the event. The operations position is responsible for the management of all operations directly applicable to the primary mission.

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Like the traditional model, the operations group within the EOC incident command model is responsible for coordinating field operations by prioritizing, directing, and controlling the available response resources (Green 2001, 48). Therefore, the operations group interfaces directly with the incident commander(s) in the field. In addition, the planning, logistics, and finance group can also easily interface with the field incident command system's planning, logistics, and finance groups. An example of the incident command system organizational model is listed in figure 4.

Figure 4. Incident Command EOC Model
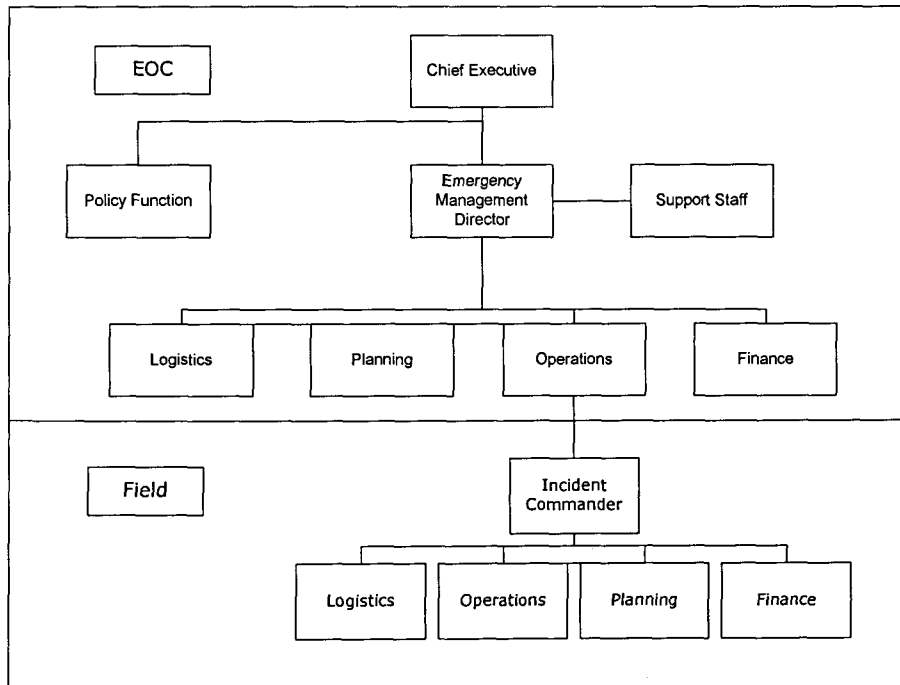
ICS/ESF EOC Model

With the federal government's response centered around the fifteen emergency support functions, nine support annexes, and seven incident annexes, some local and state governments (Florida and North Carolina for example) have followed suit and organized their EOCs using the emergency support function model (United States Department of Homeland Security. *National Response Plan* 2004*).* The Virginia Department of Emergency Management has designed the state's EOC around the emergency support functions (Commonwealth of Virginia 2006).

The ICS/ESF EOC model uses the same basic structure and positions as the ICS EOC model, but the ICS/ESF EOC model incorporates the emergency support functions under the incident command system's operations, planning, logistics, and finance sections (Green 2001, 49). The EOC organizational model utilized by California's Standardized Emergency Management System (SEMS) is an example of how the emergency support function model is used by local and state EOCs. For example, the emergency support function model used in California's Standardized Emergency Management System categorizes the emergency support functions under the operations, logistics, planning, and finance branches of the incident command system (State of California 2003, 7). Listed below in table 1 is an example of how the emergency support functions are arranged under the various ICS sections:

Table 1. Categorization of ESFs under ICS Sections

Operations	Planning
• ESF4 – Fire Fighting	• ESF5- Information/Planning
• ESF6 – Care/Shelter	
• ESF8 – Health/Medical	Logistics
• ESF9 – Search and Rescue	• ESF2 – Communications
• ESF10 – Hazardous Materials	• ESF3 – Public Works/Engineering
• ESF13 – Law Enforcement	• ESF7 – Resource Support

Each emergency support function under the operations group directly supports a counter part in the field. For example, a fire/rescue/medical branch would support a field incident commander(s) of a fire, rescue, or medical incident (Green 2001, 49). An example of the incident command system model is listed below in figure 5.

Figure 5. ICS/Emergency support function EOC model
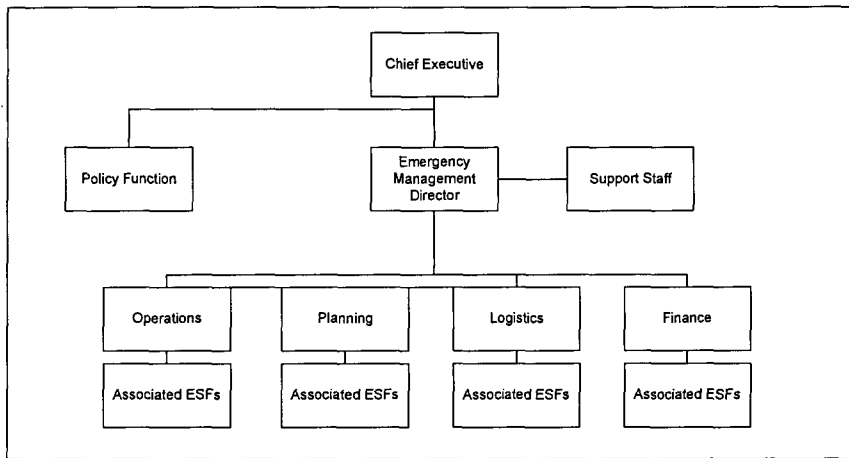
EOC Model Used by the CAUVA Emergency Management Agency

During the 2002 period, the Charlottesville/Albemarle/University of Virginia Emergency Management

Agency revised and formally adopted an emergency operations plan which defines the current incident command

system/emergency operations center interface model as shown in figure 6 (Charlottesville/Albemarle/University of

Virginia Emergency Operations Plan, 2002).

Figure 6. CAUVA EOC Model
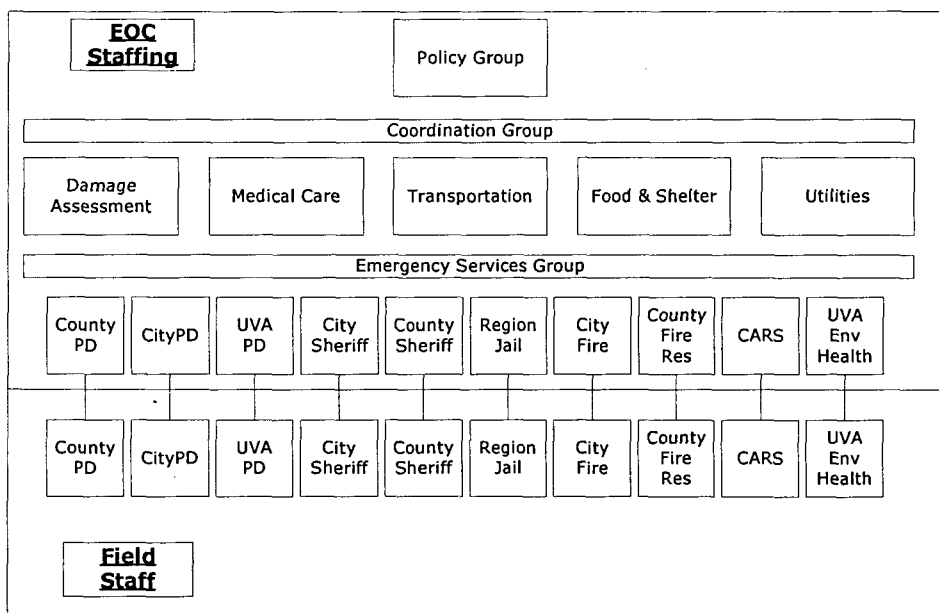
15

The Charlottesville/Albemarle/University of Virginia Emergency Management model is similar to the department model, but is organized around a policy group, a coordination group, and an emergency services group.

According to the Direction and Control section of the Charlottesville/Albemarle/University of Virginia Emergency Operations Plan, the following are broad responsibilities of the policy group, coordination group, and emergency services group (2002):

- Policy group - executive group that provides direction and control relating to local policy and approves official public information.

- Coordination group - supporting group that coordinates damage assessment analysis with the emergency services group, medical care with the local hospitals and health department, transportation with the school system and area transit authority, food/shelter with social services and the American Red Cross, and public utilities with local public works and private utilities.

- Emergency services group – public safety group that addresses fire, hazardous material monitoring/control, emergency medical services, public evacuation, law enforcement, and shelter security.

As illustrated in figure 6, the interface between the EOC emergency services group and the field is rather straight forward. Each agency represented in the EOC communicates directly to their respective agency in the field. Although the line of communications between the center and the field is well defined for agency-to-agency communications, there are no policies or guidelines that would help to define the center/field interface in times of emergency when a unified command brings together a multiple agency/multiple jurisdictional response.

The literature and extant document review yielded valuable information regarding emergency operational center organizational models and how the models interfaced with field resources. The traditional four group, department, incident command, and emergency support function organizational models emerged as the most standard models in the emergency management field. While there appeared to be no single standard organizational models for EOCs, the national incident management system and the incident command system is the desired standard system for managing field resources.

CHAPTER 3

METHOD

There were five phases used in this research. The first phase involved a literature and extant document

review to identify industry recognized EOC models and to identify the EOC model used by the CAUVA Emergency

Management Agency. The second phase involved surveying CAUVA Emergency Management Agency staff

members to determine what functions of the current EOC model need improvement. The third phase was to

categorize the EOC models of other like-sized Virginia localities and then determine the best performing

organizational models. The fourth phase was to again survey the CAUVA Emergency Management Agency staff

members to determine what components of the best performing organizational models could be adopted and utilized

to address the deficiencies identified in the first survey. And finally, the fifth phase of the research was to develop an

EOC organizational model of applicability for a growing, midsized city-county region based on the results of the

literature review and survey research.

First Phase – Literature Review Process

The literature and extant document review concentrated on identifying the various EOC organizational

models used to coordinate the response and the recovery phases of a natural or man-made event. The literature and

extant document review included emergency management journals, magazine articles, textbooks, training material,

and extant documents. The literature and extant document review was conducted at the National Fire Academy's

Learning Resource Center, the CAUVA Emergency Management Agency's library and the author's personal library.

The University of Richmond library search engine was used to perform document searches via the internet.

Keywords used during the search were incident command system/EOC interface, EOC, emergency operations plan,

incident command system, and interface model.

Second Phase – Identifying the Model Components That Need Improving

Phase two of the research process involved a survey using the Delphi process. The survey instrument and

survey process were reviewed by Mr. Steve King, Senior Advisor for the Institute for the Future (King 2006). Mr.

King suggested the use of a follow up phone call or email after the initial survey was completed to gather greater

detail about the respondent's answers.

Since the survey involved a human research component, an application was submitted to the University of Richmond's Institutional Review Board and approval was received by the Board on January 23, 2007.

The researcher decided to use the CAUVA Emergency Management Agency staff as the survey pool to identify components of the current EOC organizational model that need improvement. The following cross sectional group of staff members was selected based on their various positions held in the organization: three members of the policy group, three members of the coordination group, three members of the emergency services group, the emergency manager, and the two deputy emergency management coordinators.

The survey was conducted with the objective to identify the various functions of the current EOC organizational model that need improvement. The survey instrument (see Appendix 1 – Survey - Identifying the Model Components That Need Improving) outlined 21 functions that were derived from the *National Incident Management System, Command and Management Chapter* (United States Department of Homeland Security 2004) and the Federal Emergency Management Agency's *ICS/EOC Interface Workshop Instructor Guide* (Federal Emergency Management Agency 1995, 6). The survey instrument listed the various functions under the main headings of management/coordination, planning, logistics, finance, and administrative.

The survey instrument included a diagram of the current EOC organizational model used by the CAUVA Emergency Management Agency. The respondents were asked, based on their experience as EOC staff during exercises and events, to evaluate the model's ability to facilitate key functions related to managing an emergency event. The respondents were to rank each key function on a scale of 1-5; 1 being not effective, 2 being less effective, 3 being effective, 4 being more effective, and 5 being most effective. An essay section was provided at the end of each major heading to allow respondents to write in other functions that they believed were "not effective" or "less effective'. Once the data was collected from the first survey, respondents that marked functions with a "not effective" or "less effective" evaluation were contacted via phone and/or email and were asked to expand upon why they believed the function was not effective.

The survey instrument was created and administered using Survey Monkey, an internet based survey system. An email with a link to the online survey was sent out to each respondent.

<u>Third Phase – Determining Best Practice Models Of Other Like-sized Localities</u>

The third phase of the research process was to identify and categorize the EOC models (four function model, department model, ICS model, or ICS/ESF model) of other Virginia like-sized localities and determine the best performing EOC model. The purpose of surveying Virginia like-sized localities was to evaluate how governments of similar population have gone about structuring their EOC. The survey was designed so that the answers can be derived based on each locality's current plans and procedures and did not require the recipient to provide his or her opinion. However, since the survey involved a human research component, an application was submitted to the University of Richmond's Institutional Review Board and approval was received by the Board on November 29, 2006.

The process of determining the like-sized localities was to choose the eight Virginia localities that were closest to the population of Albemarle County (79,236). The eight localities surveyed were Suffolk City (pop. 63,677), Lynchburg City (pop. 65,269), Augusta County (pop. 65,615), Rockingham County (pop. 67,725), Montgomery County (pop. 83,829), Roanoke County (pop. 85,778), Hanover County (pop. 86,320), and Spotsylvania County(pop. 90,395). The reason for surveying localities that are close to the population of Albemarle and not the combined population of Albemarle and Charlottesville was that, while the local governments operate a regional emergency management agency, the plans, policy, and process are based on the larger locality (i.e. Albemarle County). The locality population was determined based on 2000 census data.

The survey instrument (Appendix 2 – Survey Instrument - Determining Best Practice Models Of Other Like-sized Localities) focused on the use of the incident command system by various agencies, the type of EOC model used by the localities, and the interface between the field and the EOC. The four industry-recognized EOC models that were derived from the literature review were included in the survey instrument. Respondents were asked to choose which model most closely matches the model used by their locality.

The survey instrument was created as a Microsoft Word 2003 document and was emailed to the respective emergency managers as an attachment. Some respondents required a follow up phone call, but eventually all surveys were returned completed.

Once the EOC models of other like-sized localities were indentified and categorized, the next phase was to determine the best performing EOC model. The criteria used to select the best EOC model was a combination of an interview with a Virginia Department of Emergency Management training staff member and a review of various full

scale exercise after-action reports obtained from the Virginia Department of Emergency Management. It is important to note that the after-action reports identified vulnerabilities related to public safety and emergency management organizations and are considered sensitive in nature by the Virginia Department of Emergency Management. In order to maintain confidentiality, the reports will not be listed in the works cited section of the paper nor will the localities involved in the exercises be identified. The reports themselves will be individually referred to by a randomly generated name throughout the paper.

Fourth Phase – Determining Which Best Practice Components Could Be Adopted

The fourth phase of the research process was to again survey the CAUVA Emergency Management Agency staff members to determine what components of the best performing organizational model could be adopted and utilized to address the deficiencies identified in the first survey. The survey instrument (Appendix 3 – Survey Instrument - Determining Which Best Practice Components Could Be Adopted) included the best performing organizational model and a list of the deficient functions that were identified in the previous survey. Respondents were asked to review the models and deficient functions and then were asked "How should we proceed with addressing the deficiencies found in our current EOC organizational model?" The respondents were offered three choices:

1. Replacing our current EOC model with the "Best Practice" EOC model.

2. Enhancing our current EOC model by adopting certain components of the "Best Practice" EOC model. (Answering this question took the respondents to the second phase of the survey)

3. Changing our current EOC model will not address the found deficiencies.

The survey was terminated if respondents answered questions 1 or 3 above. If respondents chose option 2, they were asked to review the best performing model and choose from a list of components that could be adopted to improve the model used by the CAUVA Emergency Management Agency.

The survey instrument was created and administered using Survey Monkey, an internet based survey system. An email with a link to the online survey was sent out to each respondent.

Fifth Phase – Developing an EOC Model of Applicability

The final phase of the research process was to develop an EOC model of applicability based on the results of the literature and extant document review and survey research. This process involved analyzing the results of the surveys and developing an EOC organizational model that improves components found deficient during the research process.

Assumptions

An assumption is made that the emergency management staff members answering the survey understood the questions, were familiar enough with their operations to answer the question, and answered the questions with accuracy. The localities surveyed may not operate in the same environment as compared to the CAUVA Emergency Management Agency. Therefore, the results of the survey should be considered a casual comparison.

Limitations

A major limitation of this research is that there are no recent, widely available investigations on the effectiveness of the various EOC models and field interface. Most of the literature published is over six years old. While there has been new and updated material written about the coordination of field operations, such as the National Incident Management System (NIMS), little material has been published about EOC models and field interface.

CHAPTER 4

RESULTS AND ANALYSIS

Phase One - EOC Models

Recognized EOC Models in the Emergency Management Field

The first phase of the research involved a literature and extant document review to identify industry recognized EOC models. Based on a literature and extant document review, it appears that there are four primary EOC models:

1. Modeled around the traditional four groups (policy group, disaster analysis, operations, and resources group)

2. Modeled by functional departments (fire, police, public works, etc.)

3. Modeled around the incident command system (ICS)

4. Modeled around the ICS to support the emergency support functions (ESF)

The EOC models, although structured differently, share some common management functions. A comparison of the emergency operation center functions is listed in table 2:

Table 2. EOC Model Function Comparison

	Policy Development	Planning	Logistics / Resources	Coordinating Field Operations
Four group model	√	Some	√	√
Department model	Not indicated	Not indicated	Not indicated	√
ICS model	√	√	√	√
ICS/ESF model	√	√	√	√

As indicated in table 2, the ICS EOC model and ICS/ESF model incorporate all EOC functions. The traditional four group model incorporates a limited planning function while the department model only incorporates the coordination of field operations function.

The EOC models vary, but there are some commonalities in the way the models interface with field operations. The traditional four group model and ICS model are similar in the way they interface with field operations. Both models have an operations group at the EOC that supports an incident commander in the field.

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The department model's field interface is direct from the department staffed at the EOC to the department's respective field resources. The field interface structure for the ICS/ESF model is somewhat similar to the field interface structure for the department model. However, in the case of the department model, the department resources interface as compared to the ICS/ESF model where the functions interface.

Current Model Used by the CAUVA Emergency Management Agency

In 2002, the CAUVA Emergency Management Agency revised and formally adopted an emergency operations plan which defines the current ICS/EOC interface model as shown in figure 6 (Charlottesville/Albemarle/University of Virginia Emergency Operations Plan, 2002).

The Charlottesville/Albemarle/University of Virginia Emergency Management model is similar to the department model, but is organized around a policy group, a coordination group, and an emergency services group.

According to the Charlottesville/Albemarle/University of Virginia Emergency Operations Plan, the following are broad responsibilities of the policy group, coordination group, and emergency services group (2002):

- Policy group - executive group that provides direction and control relating to local policy and approves official public information.

- Coordination group - supporting group that coordinates damage assessment analysis with the emergency services group, medical care with the local hospitals and health department, transportation with the school system and area transit authority, food/shelter with social services and the American Red Cross, and public utilities with local public works and private utilities.

- Emergency services group – public safety group that addresses fire, hazardous material monitoring/control, emergency medical services, public evacuation, law enforcement, and shelter security.

As illustrated in figure 6, the interface between the EOC emergency services group and the field is rather straight forward. Each agency represented in the center communicates directly to their respective agency in the field. Although the line of communications between the center and the field is well defined for agency-to-agency communications, there are no policies or guidelines that would help to define the center/field interface in times of emergency when a unified command brings together a multiple agency/multiple jurisdictional response.

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<u>Phase Two - Functions Supported by the Current CAUVA EOC Model that Need Improvement</u>

The second phase of the research process involved determining which functions of the current CAUVA EOC model need improvement. The research process involved surveying CAUVA Emergency Management staff members to identify functions of the current EOC model that need improvement. The following cross sectional group of staff members was selected based on their various positions held in the organization: three members of the policy group, three members of the coordination group, three members of the emergency services group, the emergency manager, and the two deputy emergency management coordinators.

The survey was conducted with the objective to identify the various functions of the current EOC organizational model that need improvement. The survey instrument (Appendix 1 - Survey Instrument - Identifying the Model Components That Need Improving) outlined 21 functions that were derived from the NIMS student manual, command and management chapter (United States Department of Homeland Security 2006, 5) and the Federal Emergency Management Agency's ICS/EOC Interface Workshop Instructor Guide (1995, 6). The survey was administered by a web-based survey program (Survey Monkey).

A total of 19 staff members were contacted and asked to participate. Of the 19, 16 agreed to participate and signed an IRB consent form. Of the 16 that agreed to participate, 13 responded to the survey. The detailed survey results are included in Appendix 4.

Management/Coordination Functions that Need Improving

Overall, 64.6% of the respondents stated that the current EOC model was effective, more effective, or most effective at facilitating management/coordination functions. The most effective function was "the development and communication of broad governmental policy" which 84.6% of the respondents found to be effective or above. The most ineffective function was "facilitate the process of directing controlling and coordinating response resources in coordination with field incident commander(s)" which only 53.8% of the respondents found to be effective or above. A summary of the compiled results are listed in table 3.

Table 3. Evaluation of EOC Management/Coordination Functions

Management/Coordination	Above Effective	Below Effective
Facilitate the development and communication of broad governmental policy	84.6%	15.4%
Facilitate the development of an organizational wide strategy for the management of the event	61.5%	38.5%
Facilitate the prioritization of response resources	61.5%	38.5%
Facilitate the process of directing controlling and coordinating response resources in coordination with field incident commander(s)	53.8%	46.2%
Facilitate the general communication process between the EOC and the field staff	61.5%	38.5%
Overall average	64.6%	35.4%

The survey data was also compiled using the weighted values (Not effective – 1, Less effective = 2, Effective =3, More effective = 4, Most effective = 5). The weighted average in table 4 below shows that the following management/coordination functions were found to be less than effective (weighted score of less than 3):

- Facilitate the prioritization of response resources

- Facilitate the process of directing, controlling, and coordinating response resources in coordination with field incident commander(s)

Table 4. Weighted Average of EOC Management/Coordination Functions

Management/Coordination	Policy Group	Coord. Group	Emergency Services Group	Average
	Weighted Points	Weighted Points	Weighted Points	Weighted Points
Facilitate the development and communication of broad governmental policy	3.2	4	3	3.4
Facilitate the development of an organizational wide strategy for the management of the event	3	3.25	3	3.1
Facilitate the prioritization of response resources	3	3.5	1.5	2.7
Facilitate the process of directing controlling and coordinating response resources in coordination with field incident commander(s)	3.2	3.25	2	2.8
Facilitate the general communication process between the EOC and the field staff	3	3	6	4.0
Overall average	3.08	3.4	3.1	-------

In addition to rating the various functions, one respondent noted that the current EOC physical layout would not support the current model. One respondent believes that the current EOC model is not effective at facilitating development of a clear, consistent, and accurate public message. Lastly, one respondent noted that due to the large number of EOC staff members during a full activation, it is difficult to operate. The same respondent also noted that it would be advantageous to consolidate the dispatch functions of fire, police, and public works.

Planning Functions that Need Improving

Overall, 61.5% of the respondents believed that the current EOC model was effective, more effective, or most effective at facilitating planning functions. The most effective function was "the process of communicating current and forecast situational reports" and "the process to obtain resource needs from the field staff" which 69.2% of the respondents found to be effective or above. The most ineffective functions were "the process tracking resources used during the event" and "the process of forecasting the effects of the current event" which 53.8% of the respondents found to be effective or above. A summary of the compiled results are in table 5:

Table 5. Evaluation of EOC Planning functions

Planning	Above Effective	Below Effective
Facilitate the process tracking resources used during the event	53.8%	46.2%
Facilitate the process collecting and analyzing data related to the current event	61.5%	38.5%
Facilitate the process of forecasting the effects of the current event	53.8%	46.2%
Facilitate the process of communicating current and forecast situational reports	69.2%	30.8%
Facilitate the process to obtain resource needs from the field staff	69.2%	30.8%
Facilitate the process to obtain status reports from the field staff	61.5%	38.5%
Facilitate the process of developing and implementing an event safety plan	61.5%	38.5%
Overall average	61.5%	38.5%

The survey data was also compiled using the weighted values (Not effective – 1, Less effective = 2, Effective =3, More effective = 4, Most effective = 5). The weighted average in table 6 below shows that following planning functions were found to be less than effective:

- Facilitate the process collecting and analyzing data related to the current event

- Facilitate the process of forecasting the effects of the current event

- Facilitate the process of developing and implementing an event safety plan

Table 6. Weighted Average of EOC Planning Functions

Planning	Policy Group	Coord. Group	Emergency Services Group	Average
	Weighted Points	Weighted Points	Weighted Points	Weighted Points
Facilitate the process tracking resources used during the event	2.6	3.25	3	3.0
Facilitate the process collecting and analyzing data related to the current event	2.8	2.75	3.25	2.9
Facilitate the process of forecasting the effects of the current event	2.4	3.25	3	2.9
Facilitate the process of communicating current and forecast situational reports	3	3.5	2.75	3.1
Facilitate the process to obtain resource needs from the field staff	3.6	3.5	2.25	3.1
Facilitate the process to obtain status reports from the field staff	3.2	3.25	2.75	3.1
Facilitate the process of developing and implementing an event safety plan	2.6	3	2.75	2.8
Overall average	4.04	4.5	3.95	-------

In addition to rating the various functions, one respondent noted that they were unsure about the value of web-EOC as a relevant tracking and data analysis tool and believed that web-EOC was a redundant records management system. The respondent believed that critical events that have operational impact are captured and tracked in the regional computer-aided-dispatch system.

Logistics Functions that Need Improving

Overall, 78.8% of the respondents believed that the current EOC model was effective, more effective, or most effective at facilitating logistics functions. The most effective function was "the provision of facilities including sheltering" and "the provision of transportation resources" which 84.6% of the respondents found to be effective or above. The most ineffective function was "the process of coordinating logistical resources from local, state, and federal governments, and private industries" which 69.2% of the respondents found to be effective or above. A summary of the compiled results are listed in table 7.

Table 7. Evaluation of EOC Logistics Functions

Logistics	Above Effective	Below Effective
Facilitate the provision of facilities including sheltering	84.6%	15.4%
Facilitate the provision of transportation resources	84.6%	15.4%
Facilitate the provision of supplies including food and medical	76.9%	23.1%
Facilitate the process of coordinating logistical resources from local state and federal governments, and private industries	69.2%	30.8%
Overall average	78.8%	21.2%

The weighted average in table 8 below shows that no functions were found to be less than effective (weighted score of less than 3).

Table 8. Weighted Average of EOC Logistics Functions

Logistics	Policy Group	Coord. Group	Emergency Services Group	Average
	Weighted Points	Weighted Points	Weighted Points	Weighted Points
Facilitate the provision of facilities including sheltering	3.4	3	3.5	3.3
Facilitate the provision of transportation resources	3	3.5	3.25	3.3
Facilitate the provision of supplies including food and medical	3	3.25	3.25	3.2
Facilitate the process of coordinating logistical resources from local state and federal governments and private industries	3.1	3.3	3.3	3.2
Overall average	3.1	3.3	3.3	-------

In addition to rating the various functions, one respondent noted that they believed the American Red Cross is less effective at "the provision of facilities, including sheltering" while the Salvation Army, the schools, and RACES has been more effective at facilitating overall logistics. The respondent also noted that the current EOC model did not have an EOC logistics group.

Finance Functions that Need Improving

Overall, 56.4% of the respondents believed that the current EOC model was effective, more effective, or most effective at facilitating finance functions. The most effective function was "the process of tracking time of EOC and field staff" and "the process to obtain financial needs from the field staff" which 61.5% of the respondents found to be effective or above. The most ineffective function was "the process of tracking expenditures of human and other resources" which 46.2% of the respondents found to be effective or above. A summary of the compiled results are below in table 9.

Table 9. Evaluation of EOC Finance Functions

Finance	Above Effective	Below Effective
Facilitate the process of tracking expenditures for human and other resources	46.2%	53.8%
Facilitate the process of tracking time of EOC and field staff	61.5%	38.5%
Facilitate the process to obtain financial needs from the field staff	61.5%	38.5%
Overall average	56.4%	43.6%

The weighted average in table 10 shows that all finance functions were found to be less than effective (weighted score of less than 3):

Table 10. Weighted Average of EOC Finance Functions

Finance	Policy Group	Coord. Group	Emergency Services Group	Average
	Weighted Points	Weighted Points	Weighted Points	Weighted Points
Facilitate the process of tracking expenditures for human and other resources	2.2	2.5	2.5	2.4
Facilitate the process of tracking time of EOC and field staff	2.6	2.5	2.75	2.6
Facilitate the process to obtain financial needs from the field staff	2.6	2.5	2.5	2.5
Overall average	2.5	2.5	2.6	

In addition to rating the various functions, one respondent noted that they believed that tracking data relevant to financial expenditures, particularly as it relates to reimbursable expenses, is not captured in the most efficient way. The respondent believed that tracking public safety's time is best accomplished through the region's computer aided dispatch system.

Administration Functions that Need Improving

Overall, 84.6% of the respondents believed that the current EOC model was effective, more effective, or most effective at facilitating administrative functions. The most effective function was "the process of establishing and disseminating public information" which 92.3% of the respondents found to be effective or above. The most ineffective function was "the process of establishing a liaison with local, state, and federal governments, and private entities" which 76.9% of the respondents found to be effective or above. A summary of the compiled results listed in table 11.

Table 11. Evaluation of EOC Administrative Functions

Administrative	Above Effective	Below Effective
Facilitate the process of establishing a liaison with local state and federal governments and private entities	76.9%	23.1%
Facilitate the process of establishing and disseminating public information	92.3%	7.7%
Overall average	84.6%	15.4%

The weighted average in table 12 below shows that no administrative functions were found to be less than effective (weighted score of less than 3).

Table 12. Weighted Average of EOC Administrative Functions

Administration	Policy Group	Coord. Group	Emergency Services Group	Average
	Weighted Points	Weighted Points	Weighted Points	Weighted Points
Facilitate the process of establishing a liaison with local state and federal governments and private entities	3.2	3.25	3.5	3.3
Facilitate the process of establishing and disseminating public information	3.6	3.75	3.5	3.6
Overall average	3.4	3.5	3.5	

Summary

Illustrated below in table 133 is a summary of the survey results. The respondents indicated on average that the current EOC model was effective at facilitating all functions.

Table 13. Average rating of EOC Functions

EOC Functions	Respondents that Rated Function Effective or Above	Respondents that Rated Function Below Effective
Administrative	84.6%	15.4%
Logistics	78.8%	21.2%
Management/Coordination	64.6%	35.4%
Planning	61.5%	38.5%
Finance	56.4%	43.6%

Although the all respondents on average rated EOC functions effective or above, the overall weighted averages show that the following functions were rated less than effective (rating less than 3):

Management/Coordination

- Facilitate the prioritization of response resources

- Facilitate the process of directing controlling and coordinating response resources in coordination with field incident commander(s)

Planning

- Facilitate the process collecting and analyzing data related to the current event

- Facilitate the process of forecasting the effects of the current event

- Facilitate the process of developing and implementing an event safety plan

Finance

- Facilitate the process of tracking expenditures of resources

- Facilitate the process of tracking time of EOC and field staff

- Facilitate the process to obtain financial needs from the field staff

The differences in the average rating of EOC functions and the average weighted ratings indicate that some of the respondents believe that certain functions were well below effective and ranked them as "not effective" or "less effective" thus lowering the average weighted ratings. The average weighted ratings help to determine with better accuracy which EOC functions need improvement.

Profiling like-sized localities

The third phase was to categorize the EOC organizational models of other like-sized Virginia localities and then determine the best performing organizational models. This phase involved a process that surveyed like-sized Virginia localities to determine the following:

1. Which type of EOC organizational model is used (Four group, department, ICS, or ICS/ESF)?

2. Which agencies associated with the EOC use the ICS?

3. What type of EOC/field interface is used?

A total of eight localities were surveyed as part of this research: Suffolk City (pop. 63,677), Lynchburg City (pop. 65,269), Augusta County (pop. 65,615), Rockingham County (pop. 67,725), Montgomery County (pop. 83,829), Roanoke County (pop. 85,778), Hanover County (pop. 86,320), and Spotsylvania County(pop. 90,395). The survey is designed so that the answers can be derived based on the localities current plans, process, and procedures and does not require the person being surveyed to provide his or her opinion. A summary of the results are listed in table 14 below. In order to maintain confidentiality, localities will not be listed by name. Rather, localities will be referred to generically throughout the paper.

Table 14. Results of Like-size Locality Survey

	Locality	Agencies that use the incident command system	Type of EOC model used	Type of center to field interface used
1	City 1	Fire, EMS, Law Enforcement, Emergency Management Staff	ICS/ESF	Combination of field staff communicate to EOC
2	City 2	Fire, EMS, Law Enforcement, Emergency Management Staff	Department	Combination of field staff communicate to EOC
3	County 1	Fire, EMS	Department	Combination of field staff communicate to EOC
4	County 2	Fire, EMS	Department	Combination of field staff communicate to EOC
5	County 3	Fire, EMS	Department	Combination of field staff communicate to EOC
6	County 4	Fire, EMS, Law Enforcement, Emergency Management Staff, Parks & Recreation	Department	Combination of field staff communicate to EOC
7	County 5	Fire, EMS, Law Enforcement, Emergency Management Staff	ICS	Combination of field staff communicate to EOC
8	County 6	Fire, EMS, Law Enforcement, Emergency Management Staff	Department	Combination of field staff communicate to EOC

The results of the survey show that the majority of departments use the department model, one uses the ICS model and one uses the ICS/ESF model. All localities surveyed indicated that fire and emergency medical system agencies use the incident command system on a regular basis.

Five of the eight localities reported that in addition to fire and emergency medical system agencies, law enforcement and emergency management staff use the incident command systems on a regular basis. One locality reported that the parks and recreation department use the incident command system in addition to the fire, emergency medical system, law enforcement, emergency management agencies.

All of the localities reported that their EOC/field interface involved a combination of incident commander(s) communicating to a position in the center and various departments in the field communicating directly with their counterparts in the center.

Benchmarking

The next phase involved benchmarking the four standard types of EOC models to determine which model is the best performing. The benchmarking process involved a review of two after-action reports obtained from the Virginia Department of Emergency Management and an interview with a Virginia Department of Emergency Management training staff member.

It is important to note that the after-action reports identified vulnerabilities related to public safety and emergency management organizations and are considered sensitive in nature by the Virginia Department of Emergency Management. In order to maintain confidentiality, the reports will not be listed in the works cited section of the paper nor will the localities involved in the exercises be identified. The reports themselves will be referred generically throughout the remainder of this section as exercise Alpha and Beta. Localities will also be referred to generically throughout the paper.

The first full-scale exercise was a simulated man-made event that involved multiple Virginia local governments, multiple state governments, and multiple federal agencies. The purpose of the exercise was to evaluate the response phase of emergency management. Twenty-four functions were evaluated during the exercise, and seven of those functions were related to EOC performance. Twelve localities were evaluated.

The purpose of the after-action report review was to determine which of the four standard types of EOC models performed best. Of the twelve localities evaluated, the researcher selected a locality that used the four group model, a locality that used a department model, and a locality that used an ICS/ESF model. None of the localities evaluated used the ICS model.

Listed below in table 15 is a matrix that correlates the seven functions to the type of EOC model used by the evaluated locality. The evaluations were given an "area of improvement", "neutral", or "strength" rating.

Table 15. Full Scale Exercise Alpha EOC Evaluation Results

Functions	Full Scale Exercise – Alpha			
	Four group model n=1 County 7	Department model n=1 County 8	ICS model n=0	ICS/ESF model n=1 City 1
Command and Control Structure	Neutral	Strength	N/A	Strength
Information flow among local and state EOCs	Neutral	Neutral	N/A	Neutral
Interdepartmental communication and coordination	Weakness	Strength	N/A	Neutral
Internal information flow	Neutral	Neutral	N/A	Neutral
NIMS/standardization	Weakness	Weakness	N/A	Strength
Receipt/use of outside resources	Weakness	Neutral	N/A	Neutral
Use of public information/media	Strength	Neutral	N/A	Neutral
Number of Strengths	1	2	N/A	2
Number of Neutrals	3	4	N/A	5
Number of Weaknesses	3	1	N/A	0

The results of the evaluations show that the department model and the ICS/ESF model both had two strengths. However, the department model had one weakness and the ICS/ESF model had no weaknesses. The four group model had one strength and three weaknesses.

The second full-scale exercise was a mock man-made event that involved multiple Virginia local governments, multiple state governments, and multiple federal agencies. The purpose of the exercise was to evaluate the response and recovery phases of emergency management. It was not clear how many functions were evaluated because the evaluation material was not available.

Of the six localities evaluated, the researcher selected a locality that used the four group model, a locality that used a department model, and a locality that used an ICS/ESF model. None of the localities evaluated used the ICS model.

Overall, no negative issues pertaining to EOC function were found with the locality that uses an ICS/ESF model. However, listed below are issues that were found with the localities that use the four groups and department style models:

- Lack of information flow among local and state EOCs

- Failure to establish a single strategy for the event

- Failure to use NIMS/ICS methods and practices

The after-action report also noted that one county government was in the process of restructuring their EOC model from the current four group model to the ICS/ESF model due to issues related to coordination among various center departments that staff the center.

The researcher also conducted a short interview with a training staff member of the Virginia Department of Emergency Management. The staff member is partly responsible for planning and implementing various exercises to evaluate a locality's ability to manage the response and recovery stages of a man-made or natural event. The purpose of the interview was to determine, based on the staff member's professional opinion, which of the four standard types of EOC is best.

The training staff member indicated that many Virginia localities are moving towards the ICS/ESF model to better integrate with state and federal agencies. As mentioned in the literature review, the Virginia EOC uses the ICS/ESF organizational model. The staff member believes the ICS/ESF model is used by more agencies throughout the emergency management field and may become a requirement as NIMS is integrated in to EOC operations.

Results of the Benchmark Study

It is difficult to absolutely determine the best EOC model based on the information obtained from the Virginia Department of Emergency Management because there appears to be no standard method or means to evaluate every locality's model. However, there appears to be supporting data related to this benchmark report that the ICS/ESF model is the best performing model out of the four standard types. The following supporting data was obtained from the benchmark report:

1) The results from the Alpha exercise after-action report indicates the ICS/ESF model performed the best. The evaluation did not identify any weaknesses in the ICS/ESF model, and the model had the same number of strengths as the department model.

2) The results from the Beta exercise after-action report did not identify any performance issues with the ICS/ESF model, but identified issues with the department and four group models.

3) The Virginia EOC training staff member stated that the ICS/ESF model is the best because the model integrates with state and federal agencies.

Phase Four – Determining Which Best Practice Components Could Be Adopted

The fourth phase was to again survey the CAUVA Emergency Management Agency staff members to determine what components of the best performing organizational model could be adopted and utilized to address the deficiencies identified in the first survey. The same cross sectional group of staff members as follows was selected based on their various positions held in the organization: three members of the policy group, three members of the coordination group, three members of the emergency services group, the emergency manager, and the two deputy emergency management coordinators.

The survey was conducted with the objective of identifying which components of the best practice model could be adopted and utilized to address the deficiencies found in the current CAUVA EOC model. During the first survey analysis, eight functions were determined to be "Less effective" or "Not effective." Therefore, the survey instrument used during this phase included the list of functions that were found "Less effective" or "Not effective"

and provided the participants with a diagram of the current CAUVAEOC model and the best practice model. The participants were offered the choice of adopting the best practice model as is, adopting components of the best practice model, or explaining why changing the current EOC model will not address the found deficiencies.

A total of 16 staff members agreed to participate in the survey process and signed an IRB consent form. Of the 16 that agreed to participate, 13 responded to the first survey. The same 13 members were sent the second survey and 13 participants completed the second survey. The detailed survey results were tabulated and are included in Appendix 4.

Options to Address the Deficiencies Found in the CAUVAEOC Model

The survey participants were first asked "How should we proceed with addressing the deficiencies found in our current EOC organizational model?" and were then offered three choices:

1. Replace our current EOC model with the "Best Practice" EOC model.

2. Enhance our current EOC model by adopting certain components of the "Best Practice" EOC model.

3. Changing our current EOC model will not address the found deficiencies (please explain).

A summary of the results from the first question are listed in table 14.

Table 16 – Results– How to Address Deficiencies Found in the Current EOC Model

Choices for Question 1	Respondents	Percentage
Replace our current EOC model with the "Best Practice" EOC model.	11	84.6%
Enhance our current EOC model by adopting certain components of the "Best Practice" EOC model.	2	15.4%
Changing our current EOC model will not address the found deficiencies (please explain).	0	0.0%

The survey revealed that a high majority of respondents (86.4%) chose option one: Replace our current EOC model with the "Best Practice" EOC model. None of the respondents chose option three: Changing our current EOC model will not address the found deficiencies.

The remainder (15.4%) chose option two: Enhance our current EOC model by adopting certain components of the "Best Practice" EOC model. The two respondents that chose option two "Enhance our current EOC model by adopting certain components of the 'Best Practice' EOC model" recommended the following:

Table 17. Results– Adopting Components of the Best Practice Model

Choices for Question 1	Yes	No	Other	Other with Explanation
Creating an Operations group and consolidating appropriate services	0	0	2	1. Already exists 2. Currently have this arrangement
Creating a Planning group and consolidating appropriate services	1	0	1	Already exists
Creating a Finance group and consolidating appropriate services	2	0	0	
Creating a Logistics group and consolidating appropriate services	1	0	1	Already exists
Creating a Support staff and consolidating appropriate services	0	2	0	
Placing the Emergency Management Coordinator/Deputy Coordinators in a position as the overall group coordinator.	0	0	2	1. Already exists 2. Currently have this arrangement

Both respondents indicated that the current EOC model incorporates an operations group and noted such in the comments section. Each respondent answered differently related to the planning group. One respondent agreed to creating a planning group and consolidating appropriate services while the other respondent indicated the

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planning group "already exists." Both respondents recommended creating a finance group and consolidating appropriate services. One respondent agreed to creating a logistics group and consolidating appropriate services while the other respondent indicated the logistics group "already exists." Both respondents answered no to creating a support staff and consolidating appropriate services. Both respondents indicated that the Emergency Management Coordinator/Deputy Coordinators are already in a position as the overall group coordinator.

Phase Five - Recommended Model System of Applicability for a Moderate Size, Growing City-County Region

The Charlottesville City and Albemarle County area is typical of a moderate size, growing region. Therefore, the Charlottesville City and Albemarle County area will be used as a typical region for this research.

There is an added challenge associated with developing a model system of applicability for the Charlottesville City and Albemarle County. The CAUVA Emergency Management Agency is a regional entity that involves stakeholders from the two local governments and one university. When fully staffed, the EOC can exceed 50 people. As Drabek and Evans state, adding more staff to an EOC does not necessarily add a benefit and sometimes tends to magnify communication problems (2003, 209).

Based on the advantages and disadvantages of the various models, the size of the community served, and considering the complexity associated with a regional emergency management agency, it is recommended that an ICS/ESF model be considered. This recommendation is based on the following key points:

1. The ICS/ESF model contains the policy, planning, logistics/resources and coordination of field operations functions.

2. The ICS/ESF model strikes a balance between the structure of the incident command system and the simplicity of the department model. That is, departments are assigned emergency support functions and the functions are well coordinated because the system is organized under the incident command system. Moreover, all of the localities surveyed indicated that their emergency operation center/field interface involved a combination of incident commander(s) communicating to a position in the center and various departments in the field communicating directly with their counterparts in the center. The incident command system/emergency support function model supports this method of center/field communications.

3. The Virginia Department of Emergency Management and federal government structures use a form of the incident command system/emergency support function model. If a local emergency management agency

were to adopt the incident command system/emergency support function EOC model, it should be easier to integrate local operations with the state and federal operations.

4. Training and practice is required if a locality were to restructure. Therefore, it is best to invest in a model that will more likely fulfill the long term needs of the region than to invest in a department model that is inherently flawed.

CHAPTER 6

DISCUSSION

The purpose of this research project was to determine how an EOC organization model in a growing,

midsized city-county region should be designed. In order to answer this question, the author took the following

research approach:

1. Review literature and extant documents to identify industry recognized EOC organizational

   models and the model used by the CAUVA Emergency Management Agency.

2. Survey CAUVA Emergency Management Agency staff members to determine what functions of

   the current CAUVA EOC model need improvement.

3. Determine the best performing organizational model of other like-sized Virginia localities.

4. Survey CAUVA Emergency Management Agency staff members to determine what components

   of the best performing organizational models could be adopted and utilized to address the

   deficiencies identified in the first survey.

Industry Recognized EOC Models

The first phase of the research process was to perform a literature and extant document review to seek out

industry recognized EOC models used in the emergency management field. If, during the research process, it was

discovered that an industry standard and proven EOC model existed, the process of modifying and applying the

model to a growing, midsized city-county region could be easier as compared to designing a model from scratch.

Although the literature and extant document review did not reveal an industry standard model, the research

found that there are four primary EOC models:

1. Traditional four groups model (policy, disaster analysis, operations, and resources)

2. Functional department model (fire, police, public works, etc.)

3. Incident Command System model

4. Incident Command System/Emergency Support Function model

Advantages/Disadvantages of the Various EOC Models

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Department Model

As Green states, the department organizational model requires little or no training because department staff members work within this model on a daily basis. Green further states that the model may lead to less confusion among staff members because they are familiar with their department's capabilities and resources (Green 2001, 47). Although the department model is a simple model that requires little training, the model does lack a planning function. Planning is a vital function during a disaster and involves collecting, evaluating, processing and disseminating information; developing the action plan, in coordination with the other sections/functions/teams; and maintaining documentation. In addition, the planning section maintains information on the current situation, forecasts situations, and maintains the status of resources (Federal Emergency Management Agency 1995, 27). It was the lack of planning component that led some of the CAUVA Emergency Management staff members to question their EOC model.

The Traditional Four Group Model

As Green states, the traditional four group emergency operations model assigns leadership with the role of setting policy and assigns department leaders as points of contact for their field resources. Green further states that the traditional four group emergency operations model requires less training and has a strong disaster analysis component (Green 2001, 47). Although the traditional four group emergency operations model has its advantages, like the department model, the four group model does lack a strong planning component and does not interface well with the incident command system in the field (Green 2001, 47).

Incident Command System Model

Drabek and Evans found that some agencies have adopted the incident command system as a model structure for their EOC (2003, 209). The incident command system is often used on a daily basis by police, fire, and emergency medical system agencies. Therefore, public safety agencies may operate better in a command and control environment. However, Shirey states that although the incident command system has been a standard for field operations, it has not been widely accepted as a standard model for EOCs (1997).

However, the emergency manager must balance the need for a command and control structure with the need for a less formalized coordination structure. Moreover, restructuring the EOC to a more command and control

type model may be viewed as a loss of control by participating agencies (Dilling 1995). Loss of control by participating agencies may be an issue when dealing with a multi-jurisdictional agency such as the CAUVA Emergency Management Agency.

The ICS model requires additional staff training and practice (Green 2001, 48). It has been demonstrated that training and practice is a challenge with the CAUVA Emergency Management Agency (Eggleston 2001, 15).

Incident command system/emergency support functions model

While some agencies are moving towards an EOC structure modeled after the incident command system, Drabek and Evans found that a higher number of agencies were adopting the ICS/ESF model (2003, 209). Typically, emergency support functions are assigned to agencies and thus an agency leader is assigned to the EOC. This management structure ensures that staff members are familiar with the roles, responsibilities, and objectives of the function at the center and field level (Green 2001, 49).

Although the incident command system/emergency support function model incorporates the desired functions at the center and field level, the interface with the incident command system can be complicated and requires some level of training and practice (Green 2001, 49). The Virginia Department of Emergency Management and the federal government structure their EOCs around the emergency support functions (Commonwealth of Virginia 2006). A common emergency operations structure helps to ensure better structural and communication process integration.

Likely Future Trends

The EOC models, while different in structure, have a common theme of coordinating field operations which corresponds to the Federal Emergency Management Agency's definition of the primary role of an EOC: to coordinate available resources and focus efforts on saving lives, avoiding injury, and minimizing economic loss (1995, 6). It is important to note that the results represent a summary of emergency operation center functions from an organizational structure perspective. Further research is needed to identify informal relationships and whether the informal relationships are more efficient in uncertain environments or in more formal environments.

Coordinating field operations for a small event may only require a few EOC staff members operating within a small organizational model. However, coordinating larger events puts more demands on the EOC, thus more staff

members are needed. Managing a staff that may grow and shrink as the event escalates and declines requires the use

of a modular and scalable organizational model (National Wildfire Coordinating Group 1994, 6).

With the advent of the National Incident Management System for field operations, there is work underway

to integrate NIMS in EOC operations. The United States Department of Homeland Security has published a manual

entitled *Local and Tribal NIMS Integration*, which helps localities and tribes modify current EOC plans and

procedures to align with NIMS concepts and terminology (United States Department of Homeland Security 2007). It

is likely that further NIMS integration will have an impact on the EOC models and may influence localities to move

to an incident command system model or an ICS/ESF model. Two of the Virginia local governments evaluated

during the benchmark study revealed that they were in the process of restructuring their EOC model from the current

four group model and department model to the ICS/ESF model due to issues related to coordination among various

center departments that staff the center.

The fact that NIMS and ICS are being used for field operations on a wide scale will also influence the

design of the ICS to EOC field interface. The ICS and ICS/ESF models are more effective at integrating with field

operations as compared to the other models.

The research found that there are four basic EOC models used in the industry. While there is no industry

standard model, trends indicate that future EOC models may be influenced by the NIMS and the emergency

management industry could see a standard model in the future. It is difficult to determine with certainty what model

may become the standard, but it is likely that a version of the ICS or ICS/ESF model could evolve to the standard

model.

Functions of the Current CAUVA EOC Model that Need Improving

The second phase of the research process involved determining which functions of the current CAUVA

EOC model need improvement by surveying CAUVA Emergency Management staff members. A cross sectional

group of staff members was selected based on their various positions held in the organization: three members of the

policy group, three members of the coordination group, three members of the emergency services group, the

emergency manager, and the two deputy emergency management coordinators. The survey instrument (see

Appendix 1 – Survey Identifying The Model Components That Need Improving) outlined 21 functions that were

derived from the National Incident Management System, Command and Management Chapter (United States

Department of Homeland Security 2006) and the Federal Emergency Management Agency's ICS/EOC Interface Workshop Instructor Guide (1995, 6).

The research results found that the current CAUVA EOC model was deficient in the following functional areas:

Management/Coordination

- Facilitating the prioritization of response resources

- Facilitating the process of directing, controlling, and coordinating response resources in coordination with field incident commander(s)

Planning

- Facilitating the process of collecting and analyzing data related to the current event

- Facilitating the process of forecasting the effects of the current event

- Facilitating the process of developing and implementing an event safety plan

Finance

- Facilitating the process of tracking expenditures of resources

- Facilitating the process of tracking time of EOC and field staff

- Facilitating the process of obtainimg financial needs from the field staff

It is understandable that the planning and finance functions were found deficient because the current EOC model lacks a planning and finance group. Further, prior discussions with one of the Deputy Emergency Management Coordinators and the Albemarle Social Services Director revealed the need to add planning function to the existing model. As Green states, planning is a vital function when managing large, complex disasters (Green 2001, 47).

The current model also lacks a logistics group, but the survey did not find that the model was deficient at logistical functions. Logistical functions are handled independently by each agency within the EOC. It seems logical that a centralized logistics group would benefit the EOC, but further research may be needed before a final conclusion is determined.

The survey group also determined that the current model was deficient at facilitating the prioritization of response resources and directing, controlling, and coordinating response resources in coordination with field incident commander(s). Further analysis of the survey data shows that the policy group and the coordination group

on average found these two functions to be "effective" or "most effective" while the emergency services group on average found the functions to be well below "effective". Follow up interviews with the two emergency service survey respondents (respondents requested to remain anonymous) determined that the low ratings were related to the issue surrounding the interface between the EOC and field operations and the lack of support for a unified command at the EOC and field levels. This finding supports Green's conclusion that a model centered around departments does not interface well with field resources. Interface problems exist because field resources operating under the incident command system must interface with various EOC resources that may have different titles and responsibilities (Green 2001, 51).

Determining the Best Practice Model

The third phase in the research process was to categorize the EOC organizational models of other like-sized Virginia localities and then determine the best performing organizational models.

The research revealed that the majority of departments use the department model, one uses the ICS model and one uses the ICS/ESF model. The reason behind the fact that the majority of like-sized localities use the department model is probably related to the fact that the EOC plan template available from the Virginia Department of Emergency Management outlines an EOC organizational model that is designed around departments (Eggleston 2001, 12). Although it is beyond the scope of this research, it is unclear why the two other localities use the ICS and ICS/ESF models. It is worth noting that during the research process, the researcher found that no other locality uses the ICS model.

The benchmarking process that followed revealed that the ICS/ESF EOC model was determined to be the best practice model. The ICS/ESF EOC model had the least number of weaknesses and the greatest number of strengths as compared to the department and four group models. None of the localities in the after-action reports used the ICS EOC model.

The greatest strength of the ICS/ESF EOC model was its command and control ability and its ability to integrate with the NIMS. The command and control strength is related to the fact that the incident command system is truly a command and control model (Hannestad 2005). The ICS/ESF EOC model's ability to integrate with NIMS may be due to the fact that both models are designed around the incident command system. However, Jones states that there appears to be confusion with how the ICS/ESF model integrates with field operations. Jones further states

some in the emergency management field are waiting for the Department of Homeland Security to define the interface method (Jones 2006, 2).

The literature review revealed that a downside to a centralized organizational structure is that there is more isolation among staff which leads to less communications (Dilling 1995, 3). However, neither after-action reports reviewed during the benchmark study identified communications problems with the ICS/ESF EOC model.

The fourth phase of the research process was to again survey the CAUVA Emergency Management Agency staff members to determine what components of the best performing organizational models could be adopted and utilized to address the deficiencies identified in the first survey. The survey instrument included the best performing organizational model found during the benchmark study and a list of the deficient functions that were identified in the previous survey.

The results concluded that 84.6% of the respondents chose to adopt the ICS/ESF model as presented. The other 11.4% chose to adopt planning and logistics functions.

The exact reasons behind the fact that a high majority of survey respondents chose the ICS/ESF model are not clear, but the reasons could be related to the following biases:

1. All of the survey respondents have completed the Department of Homeland Security basic NIMS training courses (IS-700, ICS-100, and ICS-200) and are familiar with the incident command system (Thomas 2006).

2. The majority of the respondents surveyed has a public safety background and/or have operated in the incident command system environment. As Dilling states, public safety personnel are comfortable with a command and control model (1995).

3. Some of the survey respondents may be familiar with the fact that the Virginia Department of Emergency Management uses the ICS/ESF EOC model during EOC activations.

CONCLUSION

Based on the research, it appears that there needs to be a balance between an EOC model that incorporates policy development, planning, logistics, and coordinating field operations. At the same time, the model should be well understood by the staff operating in the center.

The department model is by far the simplest model from an EOC staff member's perspective, but lacks basic functions needed for emergency management. The ICS model provides the vital components for emergency management and provides the best field interface, but it requires a substantial amount of staff training in order to be understood and used effectively.

The traditional four group structure is not currently used by the majority of surveyed localities. In addition, the Virginia Department of Emergency Management does not offer supporting material on the traditional four group structure. Therefore, switching to the traditional four group structure would require additional plan development and staff training.

The ICS/ESF model seems to strike a balance between meeting the emergency management functions, establishing an adequate field interface, and understanding by the EOC staff members. The model still retains a department style environment through the emergency service functions, but the model is designed around the incident command system.

A moderate sized, growing region currently using the department model should consider restructuring and using the ICS/ESF model. Although additional plan development and staff training will be required, the ICS/ESF model may prove to be a more effective method to deal with a challenging natural or man-made disaster.

The CAUVA Management Agency is facing the same type of challenges as other emergency management agencies around the country. It is difficult for emergency managers to convince emergency operations center staff members to properly train and practice, especially when the staff is not under his or her control. Moreover, redesigning the emergency operations center around functional groups or restructuring the emergency operations center to a more command and control type structure may be viewed as a loss of control by participating agencies. However, it is the emergency manager's responsibility to find solutions to these challenges and prepare his or her community for the inevitable natural or man-made event.

APPENDIX 1 Survey Instrument - Identifying the Model Components That Need Improving

Diagramed below is the current EOC organizational model used by the regional Charlottesville/Albemarle/UVA Emergency Management Agency. Based on a review of the organizational model and your knowledge of the components of the model, you will be asked to evaluate the model's ability to facilitate key functions (key functions are identified in the survey) related to managing an emergency event. The evaluation is based on a scale of 1-5 (1 being not effective, 5 being most effective).
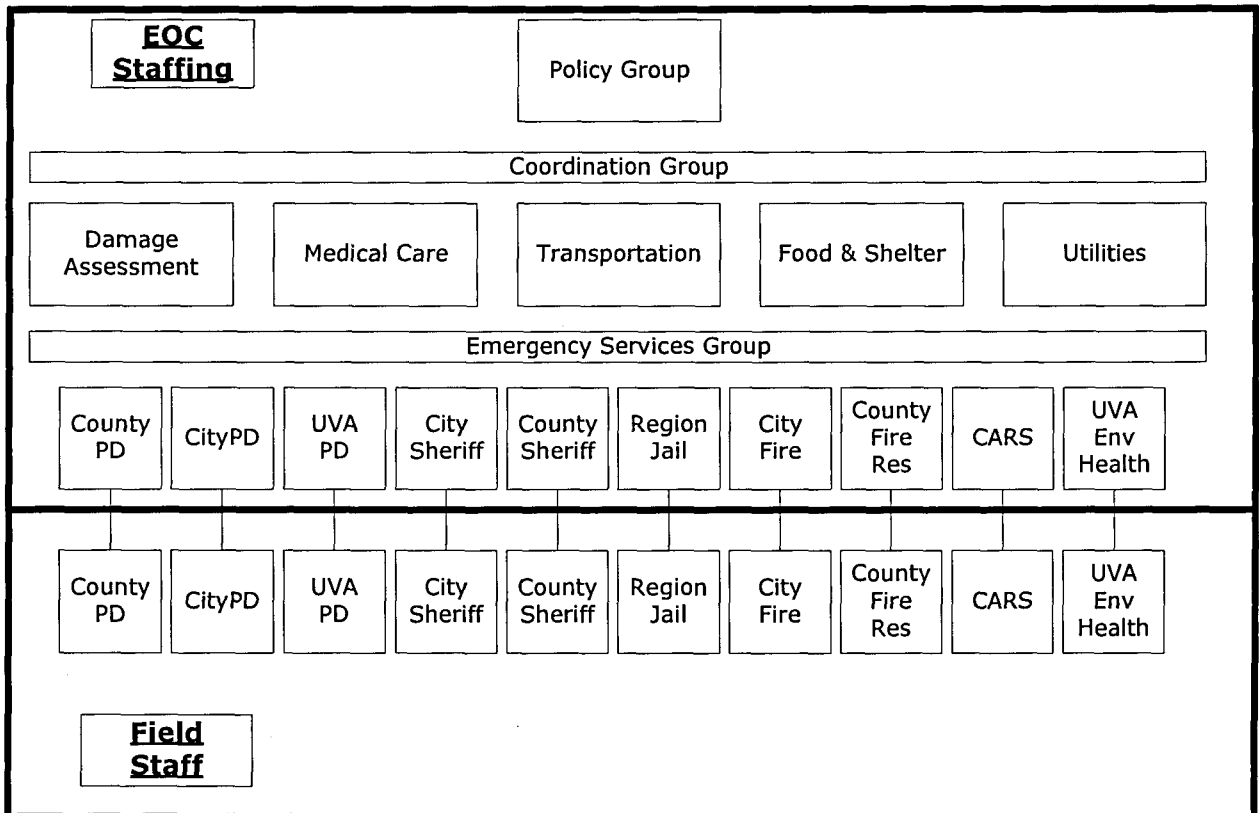
Based on your experience as an EOC staff member during training exercises and actual events, the EOC organizational model used by the Charlottesville/Albemarle/UVA Emergency Management Agency is structured to...

Management/coordination	Not effective	Less effective	Effective	More effective	Most effective
Facilitate the development and communication of broad governmental policy					
Facilitate the development of an organizational wide strategy for the management of the event					
Facilitate the prioritization of response resources					
Facilitate the process of directing, controlling, and coordinating response resources in coordination with field incident commander(s)					
Facilitate the general communication process between the EOC and the field staff					
Are there any other EOC management/coordination components not listed that are "Less effective" or "Not effective"?					

Planning	Not effective	Less effective	Effective	More effective	Most effective
Facilitate the process tracking resources used during the event					
Facilitate the process collecting and analyzing data related to the current event					
Facilitate the process of forecasting the effects of the current event					
Facilitate the process of communicating current and forecast situational reports					
Facilitate the process to obtain resource needs from the field staff					
Facilitate the process to obtain status reports from the field staff					
Facilitate the process of developing and implementing an event safety plan					
Are there any other EOC planning components not listed that are "Less effective" or "Not effective"?					

Logistics	Not effective	Less effective	Effective	More effective	Most effective
Facilitate the provision of facilities including sheltering					
Facilitate the provision of transportation resources					
Facilitate the provision of supplies including food and medical					
Facilitate the process of coordinating logistical resources from local, state, and federal governments and private industries					
Are there any other EOC logistics components not listed that are "Less effective" or "Not effective"?					

Finance	Not effective	Less effective	Effective	More effective	Most effective
Facilitate the process of tracking expenditures for human and other resources					
Facilitate the process of tracking time of EOC and field staff					
Facilitate the process to obtain financial needs from the field staff					
Are there any other EOC finance components not listed that are "Less					

effective" or "Not effective"?	

Administrative	Not effective	Less effective	Effective	More effective	Most effective
Facilitate the process of establishing a liaison with local, state, and federal governments and private entities					
Facilitate the process of establishing and disseminating public information					
Are there any other EOC administrative components not listed that are "Less effective" or "Not effective"?					

1. Based on current policy, which of the following departments use the incident command system?

    ❑ Fire   ❑ Public Works/Utilities

    ❑ EMS   ❑ City/County Administration

    ❑ Law Enforcement   ❑ Emergency Management

    ❑ Public Information   ❑ Social Services/Sheltering

    ❑ Transportation   ❑ Health Department

2. Review the attached EOC models and select the model that best matches the one used by your locality.

    ❑ Modeled around the tradition four groups (policy group, disaster analysis, operations, and resources

    group)

    ❑ Modeled by functional departments (fire, police, public works, etc.)

    ❑ Modeled around the incident command system

    ❑ Modeled around the Incident Command System to support the emergency support functions

    ❑ Other (please define)

3. Based on current policy, which of the following emergency operation center/field interface methods best describes your mode of operation?

    ❑ The incident commander(s) communicates directly with a position in the EOC.

    ❑ The various department leaders in the field communicate directly with their counterparts in the EOC.

    ❑ A combination of incident commander(s) communicating to a position in the EOC and various

    departments in the field communicating directly with their counterparts in the EOC

    ❑ Other (please define)

    ❑ There is no defined line of communications from the EOC to field operations.

EOC Models

EOC - Modeled around the traditional four groups	**Chief Executive** **Policy Group** Executive Heads Department Heads **Emergency Manager/ Director** — **Staff Support** **Operations & Operational Response** — **Disaster Analysis & Coordination** — **Resources**
EOC - Modeled by functional departments	Director of Emergency Services Coordinator of Emergency Services Phone operator — Message Clerk — RACES Operator — Public Information Officer Fire — Law Enforcement — Public Works/ Utilities — Social Servcies/ Shelter — Transportation — Heath Department
EOC - Modeled around the incident command system	EOC — Chief Executive Policy Function — Emergency Management Director — Support Staff Logistics — Planning — Operations — Finance

| EOC - Modeled to support the emergency service support functions | |
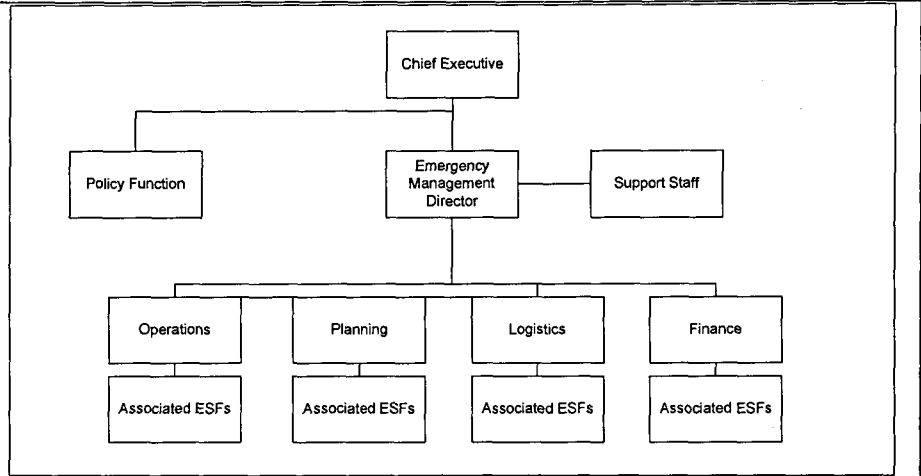
Based on the previous survey in which you participated, the results indicated our current emergency operations center organization model was "Less effective" or "Not effective" at facilitating the following functions:

Management/Coordination
- Facilitate the prioritization of response resources
- Facilitate the process of directing controlling and coordinating response resources in coordination with field incident commander(s)

Planning
- Facilitate the process collecting and analyzing data related to the current event
- Facilitate the process of forecasting the effects of the current event
- Facilitate the process of developing and implementing an event safety plan

Finance
- Facilitate the process of tracking expenditures for human and other resources
- Facilitate the process of tracking time of EOC and field staff
- Facilitate the process to obtain financial needs from the field staff

Listed below is the current EOC organizational model used by the region and a "Best Practice" EOC organizational model derived from a benchmark study. Please review the two models and be prepared to answer a few short questions (you may wish to print this page before proceeding)

Policy Group

City Manager	UVA Executive Vice President
County Executive	City Fire Chief
UVA Police Chief	City Public Works Director
City Police Chief	County Service Authority Director
County Police Chief	UVA Chief facilities officer
County Fire rescue Chief ·	UVA Environmental Health & Safety Director

Attached to the Policy Group
ECC Director
Emergency Management Coordinator

Coordination Group

Damage Assessment	Medical Care	Transportation	Food & shelter	Utilities
County Service Authority	Health Department	City Transit	City Social Services	City Gas
City Building Maintenance	UVA Health Services	County Transit	County Social Services	City Water Wastewater
City Public Service	Martha Jefferson Hospital	UVA UTS	UVA Athletic Department	Rivanna Water & Sewer
UVA Facilities Management			American Red Cross	County Service Authority
VDOT			City Schools	Sprint
			County Schools	

Attached to the Coordination Group
Public Information Officers--2 Deputy Coordinators--Attorneys--Finance Departments--RACES

Emergency Services Group

City Police	County Police	University Police	City Sheriff	County Sheriff	Regional Jail	City Fire	County Fire rescue	CARS	UVA Env. Health

Attached to the Emergency Services Group
Deputy Emergency Management Coordinator

Best Practice EOC Model

1. How should we proceed with addressing the deficiencies found in our current EOC organizational model?

☐ Replace our current EOC model with the "Best Practice" EOC model.

☐ Enhance our current EOC model by adopting certain components of the "Best Practice" EOC model.

☐ Changing our current EOC model will not address the found deficiencies (please explain).

<Participants will be taken to the question below if the
top or bottom statements above were selected>

2. Please review the current and "Best Practice" models and select which components of the "Best Practice" model could be adopted by our agency to address found deficiencies:

Creating an Operations group and consolidating appropriate services

☐ Yes
☐ No
☐ Other (please specify)

Creating an Planning group and consolidating appropriate services

☐ Yes
☐ No
☐ Other (please specify)

Creating an Logistics group and consolidating appropriate services

☐ Yes
☐ No
☐ Other (please specify)

Creating an Finance group and consolidating appropriate services

☐ Yes
☐ No
☐ Other (please specify)

Creating an Administrative group and consolidating appropriate services

☐ Yes
☐ No
☐ Other (please specify)

Placing the Emergency Management Coordinator/Deputy Coordinators in a position as the overall group coordinator.

☐ Yes
☐ No
☐ Other (please specify)

Appendix 4 Survey Results – CAUVA EOC Functions that Need Improving

Management/coordination

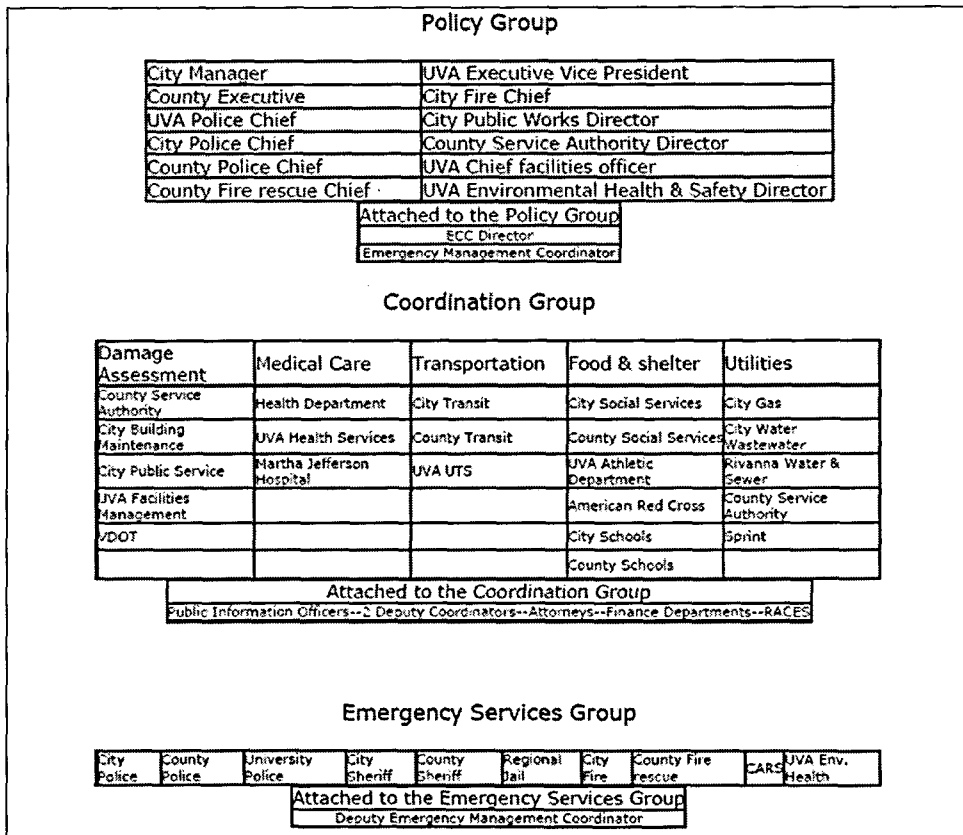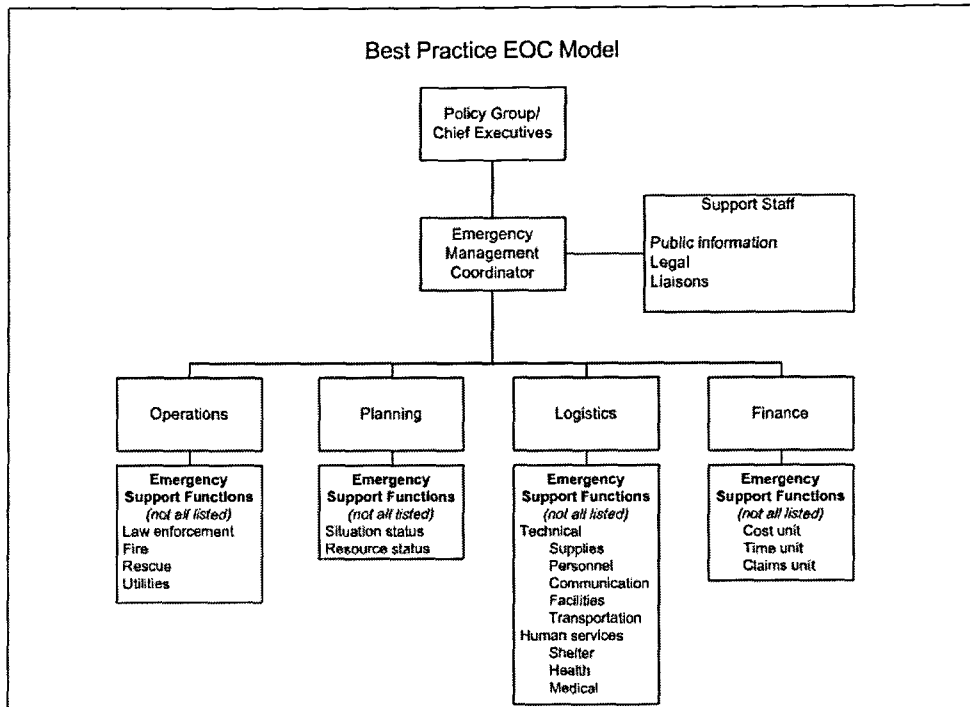|	Not effective	Less effective	Effective	More effective	Most effective	Response Average	Above Effective	Below Effective
Facilitate the development and communication of broad governmental policy	1	1	6	2	3	3.38	84.6%	15.4%
Facilitate the development of an organizational wide strategy for the management of the event	1	4	4	2	2	3	61.5%	38.5%
Facilitate the prioritization of response resources	0	5	4	1	3	3.15	61.5%	38.5%
Facilitate the process of directing controlling and coordinating response resources in coordination with field incident commander(s)	3	3	2	4	1	2.77	53.8%	46.2%
Facilitate the general communication process between the EOC and the field staff	3	2	6	2	0	2.54	61.5%	38.5%
Overall average	1.6	3	4.4	2.2	1.8	3.0	64.6%	35.4%

Total Respondents 13
(skipped this question) 0

Are there any other EOC management/coordination components not listed that are "Less effective" or "Not effective"?

Comment: Facilitate development of a clear, consistent and accurate public message

Comment: The current actual facility is outdated, poor layout for an EOC use, has to much exposure to the outside elements, and is overtaxed room by room. Therefore the facility is no longer effective to support the size of our local EOC model.

Comment: Sometimes during large exercises there are so many participants that the process becomes chaotic, and thus not very effective. This, however, has improved greatly over the last 3 years. Additionally, I am wondering how productive it would be to c

Total Respondents 3
(skipped this question) 10

Planning

	Not effective	Less effective	Effective	More effective	Most effective	Response Average	Above Effective	Below Effective
Facilitate the process tracking resources used during the event	0	6	2	5	0	2.92	53.8%	46.2%
Facilitate the process collecting and analyzing data related to the current event	0	5	5	2	1	2.92	61.5%	38.5%
Facilitate the process of forecasting the effects of the current event	1	5	3	3	1	2.85	53.8%	46.2%
Facilitate the process of communicating current and forecast situational reports	2	2	5	1	3	3.08	69.2%	30.8%
Facilitate the process to obtain resource needs from the field staff	1	3	4	3	2	3.15	69.2%	30.8%
Facilitate the process to obtain status reports from the field staff	1	4	3	3	2	3.08	61.5%	38.5%
Facilitate the process of developing and implementing an event safety plan	3	2	4	3	1	2.77	61.5%	38.5%
Overall average	1.1	3.9	3.7	2.9	1.4	3.0	61.5%	38.5%

Total Respondents 13
(skipped this question) 0

Are there any other EOC finance components not listed that are "Less effective" or "Not effective"?

Comment: Items 1 and 2 in question 3 are answered "less effective" because I am not entirely sold in the value of web-EOC as a relevant tracking and data analysis tool. To some extent, it is a redundant RMS. More often than not, critical events that have

Total Respondents 1
(skipped this question) 12

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Finance

	Not effective	Less effective	Effective	More effective	Most effective	Response Average	Above Effective	Below Effective
Facilitate the process of tracking expenditures for human and other r	2	5	5	1	0	2.38	46.2%	53.8%
Facilitate the process of tracking time of EOC and field staff	3	2	6	1	1	2.62	61.5%	38.5%
Facilitate the process to obtain financial needs from the field staff	3	2	7	0	1	2.54	61.5%	38.5%
Overall average	2.7	3.0	6.0	0.7	0.7	2.5	56.4%	43.6%

Total Respondents 13
(skipped this question) 0

Are there any other EOC finance components not listed that are "Less effective" or "Not effective"?

Comment: This always seems to be addressed after the fact.

Comment: It seems to me that tracking data that is relevant to financial expenditure, particularly as it relates to reimbursable expenses, is not captured in a most efficient way. Time tracking is best accomplished through CAD as it relates to the public

Total Respondents 2
(skipped this question) 11

Administrative

	Not effective	Less effective	Effective	More effective	Most effective	Response Average	Above Effective	Below Effective
Facilitate the process of establishing a liaison with local state and federal governments and private entities	0	3	5	3	2	3.31	76.9%	23.1%
Facilitate the process of establishing and disseminating public information	0	1	5	5	2	3.62	92.3%	7.7%
Overall average	0.0	2.0	5.0	4.0	2.0	3.5	84.6%	15.4%

Total Respondents 13
(skipped this question) 0

Are there any other EOC administrative components not listed that are "Less effective" or "Not effective"?
Total Respondents 0
(skipped this question) 13

Management/coordination

	LastName	Facilitate the development and communication of broad governmental policy	Facilitate the development of an organizational wide strategy for the management of the event	Facilitate the prioritization of response resources	Facilitate the process of directing, controlling, and coordinating response resources in coordination with field incident commander(s)	Facilitate the general communication process between the EOC and the field staff
Policy Group	Eggleston	3	2	2	2	3
	Werner	4	3	2	3	3
	Longo	3	3	3	3	3
	Thomas	3	4	5	4	3
	Hanson	3	3	3	4	3
	Average	**3.2**	**3**	**3**	**3.2**	**3**
Coordination Group	Fletcher	5	5	5	5	4
	Ralston	3	2	2	2	2
	Sidebottom	5	4	4	4	4
	Catlin	3	2	3	2	2
	Average	**4**	**3.25**	**3.5**	**3.25**	**3**
Emergency Services Group	Haugh	2	2	2	1	1
	Brown	4	3	3	4	3
	Hartman	5	5	5	1	1
	Oprandy	1	1	2	1	1
	Average	**3**	**2.75**	**3**	**1.75**	**1.5**
	Overall Average	**3.4**	**3.0**	**3.2**	**2.7**	**2.5**
	Standard Deviation	**1.2**	**1.2**	**1.2**	**1.4**	**1.1**

Planning

LastName	Facilitate the process tracking resources used during the event	Facilitate the process collecting and analyzing data related to the current event	Facilitate the process of forecasting the effects of the current event	Facilitate the process of communicating current and forecast situational reports	Facilitate the process to obtain resource needs from the field staff	Facilitate the process to obtain status reports from the field staff	Facilitate the process of developing and implementing an event safety plan
Policy Group							
Eggleston	2	3	1	1	3	3	1
Werner	2	2	2	3	3	2	2
Longo	2	2	3	3	3	3	3
Thomas	4	4	4	5	5	4	4
Hanson	3	3	2	3	4	4	3
Average	**2.6**	**2.8**	**2.4**	**3**	**3.6**	**3.2**	**2.6**
Coord. Group							
Fletcher	3	3	4	5	5	5	3
Ralston	2	2	3	2	2	2	2
Sidebottom	4	3	4	4	4	4	4
Catlin	4	3	2	3	3	2	3
Average	**3.25**	**2.75**	**3.25**	**3.5**	**3.5**	**3.25**	**3**
Emergency Services Group							
Haugh	2	2	3	3	1	1	1
Brown	4	4	2	2	2	3	4
Hartman	4	5	5	5	4	5	5
Oprandy	2	2	2	1	2	2	1
Average	**3**	**3.25**	**3**	**2.75**	**2.25**	**2.75**	**2.75**
Overall Average	**3.0**	**2.9**	**2.9**	**3.1**	**3.1**	**3.1**	**2.8**
Standard Deviation	1.0	1.0	1.1	1.4	1.2	1.3	1.3

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Logistics

		LastName	Facilitate the provision of facilities including sheltering	Facilitate the provision of transportation resources	Facilitate the provision of supplies including food and medical	Facilitate the process of coordinating logistical resources from local, state, and federal governments and private industries
Policy Group		Eggleston	3	2	3	3
		Werner	3	3	3	3
		Longo	3	3	3	3
		Thomas	4	4	3	3
		Hanson	4	3	3	4
		Average	**3.4**	**3**	**3**	**3.1**
Coord. Group		Fletcher	4	4	4	3
		Ralston	2	3	2	2
		Sidebottom	3	4	4	4
		Catlin	3	3	3	2
		Average	**3**	**3.5**	**3.25**	**3.3**
Emergency Services Group		Haugh	4	3	4	2
		Brown	3	3	2	3
		Hartman	5	5	5	5
		Oprandy	2	2	2	2
		Average	**3.5**	**3.25**	**3.25**	**3.3**
Overall Average			**3.3**	**3.3**	**3.2**	**3.2**
Standard Deviation			**0.8**	**0.7**	**0.8**	**0.9**

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Finance

	LastName	Facilitate the process of tracking expenditures for resources	Facilitate the process of tracking time of EOC and field staff	Facilitate the process to obtain financial needs from the field staff
Policy Group	Eggleston	2	3	2
	Werner	2	2	3
	Longo	2	3	2
	Thomas	3	2	3
	Hanson	2	3	3
	Average	**2.2**	**2.6**	**2.6**
Coord. Group	Fletcher	3	3	3
	Ralston	1	1	1
	Sidebottom	3	3	3
	Catlin	3	3	3
	Average	**2.5**	**2.5**	**2.5**
Emergency Services Group	Haugh	1	1	1
	Brown	4	4	3
	Hartman	3	5	5
	Oprandy	2	1	1
	Average	**2.5**	**2.75**	**2.5**
	Overall Average	**2.4**	**2.6**	**2.5**
	Standard Deviation	**0.7**	**1.1**	**1.0**

Administrative

	LastName	Facilitate the process of establishing a liaison with local, state, and federal governments and private entities	Facilitate the process of establishing and disseminating public information
Policy Group	Eggleston	3	3
	Werner	3	4
	Longo	3	3
	Thomas	4	4
	Hanson	3	4
	Average	**3.2**	**3.6**
Coord. Group	Fletcher	4	5
	Ralston	2	3
	Sidebottom	5	4
	Catlin	2	3
	Average	**3.25**	**3.75**
Emergency Services Group	Haugh	3	4
	Brown	4	3
	Hartman	5	5
	Oprandy	2	2
	Average	**3.5**	**3.5**
	Overall Average	**3.3**	**3.6**
	Standard Deviation	**1.0**	**0.7**

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BIOGRAPHY

John D. Eggleston

John Eggleston, EFO-CFO, began his fire service career in 1978 and is the Chief of the Albemarle County Department of Fire Rescue. Chief Eggleston is a former volunteer chief officer with Chesterfield Fire & EMS and has held career chief officer positions in the southeast. Chief Eggleston has an AAS Degree in Engineering, a BS degree in business, and is pursuing a graduate degree in Disaster Science from the University of Richmond. He is a graduate from the National Fire Academy's Executive Fire Officer Program and received his Chief Fire Officer Designation (CFOD) from the Commission on Fire Accreditation International. Chief Eggleston is a Commonwealth of Virginia Department of Fire Programs adjunct fire instructor and is an active member of the International Association of Fire Chiefs and the Virginia Fire Chiefs Association. He has published many articles and research papers relating to fire and EMS administration and emergency management and has lectured and consulted throughout the country.