MANAGEMENT OF THE INVESTIGATION PROCESS AT MAJOR INCIDENTS

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ABSTRACT
The goal of any fire or explosion investigation is to determine the origin, cause and responsibility for the event. However, investigations at major incidents present many challenges to the entity (public or private sector) that is charged with managing the entire investigative process.

The efficient management of the investigation of a major incident is a critical aspect of meeting the overall goal of the investigation in a safe and timely manner. This paper endeavors to provide sample management models that can be utilized by either the public or private sector to organize and manage resources, enhance scene safety, improve communication between interested parties and cooperating agencies, and improve the overall quality of the ongoing investigative procedures of all involved.

To accomplish the development of investigation management models, it was determined that the model should not be based on “people” but to base it on “function” so that the model could be expanded or contracted as need arises. The model also needed to be functional, user friendly and not require excessive resources. Utilizing the key concerns identified as a part of the planning process the management models were developed and tested.

By implementing a sound management model, the overall goals of the investigative process will be met in a timely and efficient manner.

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I. INTRODUCTION

A. PURPOSE OF AN INVESTIGATION

Major fire or explosion incidents are investigated for a variety of reasons, but the common denominator for all is the prevention of a similar incident which results in the saving of lives, property and protecting the environment.

Major fire or explosion incidents can occur as a result of a single fire or explosion incident or as a result of either a natural (i.e. tornado, earthquake, flood or other) or man made (process failure, hazardous materials leak or spill, terrorist act, train derailment, or similar event) disaster.

For example; a Natural Disaster is the cause of the event, but the resulting fire or explosion causes more damage than it should. In looking at the overall event, the investigation into the origin or cause of the event may be fairly simple, but the analysis of why the event caused loss of life, injuries, property damage or damage to the environment may not be as easy to determine and will require a management system that will facilitate the investigative process as well as protect the interests of those involved in the investigation.

B. DEFINITION OF A MAJOR INVESTIGATION

In NFPA-921 Guide to Fire and Explosion Investigations, 2004 edition in Chapter 27, a major fire or explosion incident is described as follows.

27.1.1 A major fire or explosion incident may include fatal fires, fires in high-rise buildings, incidents involving major damage to large complexes or multiple buildings, conflagrations involving a large monetary loss, or fires resulting in a large number of personal injuries. While major incidents are not always large in size or magnitude, they do tend to be more complex. As a result, the primary goals in such circumstances are to preserve the evidence and to preserve the interests of the different parties involved. 1

While the description included in NFPA-921 may not be all inclusive or provide sufficient guidance to the user to determine if they have a major incident or not, it is, at least, a start. For the purposes of this paper, a major fire or explosion incident will be defined as an incident which generally includes a diversity of interests and one or more of the following items: more than one fatality; involve major damage to large complexes; multiple buildings or high rise structures that involve more than one fire compartment; involve large monetary losses; may involve a large number of injuries; and those that may involve multiple governmental agencies.

While there could be other items included in the description, a key aspect of the determination of a major incident may just be that the incident is greater than the resources or capabilities of the local response and investigative organization.

C. GOALS OF THE INVESTIGATIVE PROCESS

Goals of the investigative process are multi-level and can be biased by the reason that an individual entity is participating in the process. Again, for the purposes of this paper, the goals of the investigative process are as follows:
Goal: The prevention of a future event of this type or the reduction of the impact of a future event through the adoption of improved methodologies, codes and standards, processes or other activities that will allow the achievement of the goal.

The goal can best be achieved through the completion of the following objectives:

1. Determination of the Origin and Cause of the incident.

2. Analysis of the factors that contributed to the loss of life or injuries.

3. Analysis of the factors that contributed to the damage.

4. Implementation of a corrective strategy for the origin and cause findings, which could include; code change, design change, further research for solutions, legal action and any other strategy that would assist in the prevention or lessening of the damage of a similar event.

The completion of these objectives is best achieved by the Preservation of Evidence at the scene and the protection of the interests of the affected parties.

It should be understood that the scope or interest of a single entity involved in the investigative process may limit their activities relative to the overall goal of the investigation. They will still have a stake in the overall goal.

Additionally, depending on an individual interest or scope, they may be more focused in one aspect of the investigative process or area. This interest or scope must be understood by those managing the investigative process so that the needs of those entities may be met.

Examples of those that may participate in varying ways during a major incident investigation include:

1. Governmental Agencies such as, Fire and Emergency Services, Law Enforcement, Occupational Safety, Disease Control, Environmental, Research, Educational and Research and Emergency Management.

2. Non-Governmental Agencies such as, Codes and Standards making organizations, Research Organizations, Insurance Companies, Legal Community and representatives from the Private Fire Investigation community, Manufacturing and Processing Community and others that have an interest in the overall investigation.

This list is provided as an example and is not all inclusive.

D. INVESTIGATIVE FUNCTIONS

Regardless of the magnitude of an incident or investigation or the actual number of participants in the investigative process, there are a number of investigative functions that will need to be completed. The management of each of the functions or the technique determined for the completion of those tasks is dependent on the purpose of those participating in the investigation.

Additionally, the size of the management model will be fluid depending on the resources and time that may be required to complete those functions. The resources necessary may be
dependent on the start of the investigation in relationship to the control of the incident. As an example, during the control of a Major Incident, the need for an investigation will have already have been identified, as the control activity progresses, the individual that will be managing the investigation process will begin to gather appropriate resources and personnel based on the evolution of the scope of the investigation.

All investigations will have similar basic functions that need to be completed including: Documenting the Investigation; Evidence Collection; Scene Safety and Security; Origin and Cause Determination; and a variety of Administrative Functions such as finances, planning, logistical support, scheduling, coordination between agencies and interested parties, and media or public information. The methodologies that the Investigation Manager chooses to utilize to complete these tasks will often be determined by the specific scene, investigative priorities, legal limitations and issues, and resources available.

E. NEED FOR A MANAGEMENT MODEL

Management of Major Incident Investigations has been ongoing for many years. As a result of not having a sound working model to draw from, those that were charged with the Management process were often being controlled by the pressures of the moment and reacting to circumstances rather than planning and implementing management practices to increase the effectiveness of the investigative practices. In many instances, those in the management role implemented most all of the components that are included in this paper, they just did not have a codified model to assist them in the planning and implementation of operational practices.

For many years the public sector utilized incident management models to improve the efficiency of the incident control and post incident actions. The model used, Incident Command System has also improved inter-agency cooperation and effectiveness even though the basic ICS system was designed to be a single agency management model.

On February 28, 2003 the President of the United States issued Homeland Security Presidential Directive – 5 (HSPD-5). The directive provides presidential direction towards the Management of Domestic Incidents with the purpose to enhance the ability of the United States to manage domestic incidents by establishing a single, comprehensive national incident management system. As a result of the directive and subsequent development and implementation actions, governmental agencies at the federal, state and local levels were to function under a single emergency management model, National Incident Management System (NIMS). The belief is that when multiple agencies respond to and operate at disaster scenes, coordination efforts will be minimized and efficiency of operations will be gained.

The private sector, while not included in the Presidential Directive will ultimately be affected by the implementation and use of the incident management system. Currently, the U. S. Occupational Safety and Health Administration (OSHA) has adopted the use of NIMS as a part of the recommendations for employers and employees working at disaster sites. NIMS is taught during the OSHA Disaster Site Worker Train the Trainer Course and the OSHA Disaster Site Worker 10 hour course. This class, similar to both the 10 hour General Industry and Construction Industry courses, provide a worker with a card indicating that they have been trained to safely work on site. The emphasis of the Disaster Site Worker program is to enhance the ability of construction workers needed for site excavation and cleanup to operate in a safe and efficient manner. The assistance of the construction worker may be critical during incident control periods, the investigation and during cleanup activities.
Lastly, OSHA mandates that a safe workplace be provided by the host employer and the individual employer at multiple employer work sites. The host employer has responsibilities that must be met regardless of the number of employees the host has. Multi-employer worksites would be common at major incident investigations as a result of multiple interested parties, heavy equipment operators, laborers, and other contracted services. The development and implementation of a sound management model at major incidents will have to be accomplished regardless of the scene being investigated by the public or private sector. Interaction of interested parties, the legal system, Occupational Safety and Health compliance issues, scene security, resources, and all of the other scene management responsibilities will have to be organized into an operable system. How formal, detailed, and large that system is can only be determined by the scene and resources available. However, the Investigation Manager will still be required to complete all of the investigative, security and safety related functions.

II. CONTROL OF THE SCENE
Control of a major incident scene during incident control, investigation, and cleanup places a great deal of responsibility on the “Incident Manager”.

A. POTENTIAL CRIME SCENE
Control of a major fire or explosion scene during the initial investigation is often maintained by the public sector emergency response agencies. In the US, this is most likely the Fire Service, however, as we are addressing a “major incident”, other agencies at the federal, state or local level may also be involved. At such times, an emergency management agency may be brought in to assist with the coordination efforts.

When a potential crime scene exists, access by non-governmental agencies may be limited until the scene is processed. However it should be remembered that at some time, the control of the scene will be transferred back to the property owner or their agent.

B. NON-CRIME SCENE
After the public sector investigators complete their investigative responsibilities or determine that the scene is not a crime scene the public agency in control will transfer the control of the incident scene to the property owner or their agent. Examples of those agents can include legal counsel, insurance company or the fire investigation team that has been retained. Once the scene control has been transferred, the “entity in control” will now assume the role of Investigation Manager and will have many items that will require attention and organization.

III. PUBLIC SECTOR MANAGEMENT MODEL
The upper levels of the management model including the Sections, Incident Command, Safety Officer, Public Information, and Liaison Officer all follow the NIMS guidelines. These roles and responsibilities have been in place for many years. This paper endeavored to formulate the Investigative Branch that would be a part of the Operations Sector. Depending on when the investigative process starts, there may or may not be an incident management model in operation. As an example, if the investigative process begins while the incident is being controlled, the Investigative Branch will function as a part of the overall management model. If the incident has been controlled and the response agencies have transferred control of the scene to the Investigation Team, the Investigation Team Manager will assume the responsibilities of the Incident Commander and assign some of the administrative functions to other investigators as needed. When reviewing the public sector model it should be remembered that the functions identified at the “Division” level are functions, not necessarily people. Again the determining
factor as to the number of people needed to perform the functions is the scene and resources determined by the Investigation Manager.

**Figure 1: Public Sector Model**

**INVESTIGATION BRANCH**

1. Investigation Branch Manager: Responsible for coordinating and managing all of the investigative functions and works through the Operations Sector Officer and the overall Incident Management. The Investigation Branch Manager schedules briefings and manages information flow between each of the Investigation Teams and Team Leaders as well as communication between each of the Divisions in this Branch.

2. Staging and Resource Manager: Coordinates the resources and supply staging for the Investigation Branch and works with the Staging Area Manager.

3. Construction/Clean Up Liaison: Communicates needs for heavy equipment and debris removal to the Construction/Clean Up Branch. The liaison also works with the Staging and Resource Manager for staging and moving of heavy equipment.

4. Safety Division: Coordinates Scene Safety for those in the Investigation Branch and also works with the Incident Safety Officer to provide a safe work place.

5. Diagram Division: Coordinates the completion and storage of diagrams completed by the individual search teams as needed.

6. Photography Division: Coordinates and manages all aspects of photography at the incident scene including cataloging, storage and retrieval systems.

7. Evidence Division: Coordinates the collection, documentation and storage of evidence collected during the investigation. Supplies evidence technicians to each of the Investigation Teams.
8. Scene Search Division: Coordinates the need for searchers and diggers (labor force) for assisting the work done by the Investigation Teams.

9. Interview Division: Coordinates both on and off scene interviews and data collection to aid in the investigation process.

10. Logistic Division: Maintains communication with the Logistics Section to identify and supply resource needs. This manager also, manages the flow of resources to each of the Divisions within this Branch.

IV. PUBLIC AND PRIVATE SECTOR INTERFACE

Describing how the interface between the Public and Private Sectors should be handled is one of the most difficult parts of this research paper. While, on the surface, it should be very easy for the Public Sector to just hand over the scene once they have completed their investigative responsibilities and then the Private Sector to just move forward with their investigative responsibilities. This really is not a simple process.

A first consideration, the scene may remain a part of a criminal investigation and there are some items that the Public Sector cannot share with the Private Sector. However, a private briefing of the person(s) that will control the scene and continue the investigation assists in the completion of the investigation of interested parties that may become a part of any Civil Litigation.

A second consideration, if the scene is not part of a criminal investigation, then the Public Sector Investigators need to provide a briefing to the person(s) that will be completing the second phase of the investigation. Examples of items that should be included in the briefing are: access to photographs taken prior to the scene being disturbed and any additional photographs that document the previous investigation; status of evidence that may have been collected including preservation and exchange; diagrams completed during the investigation; and an updating of those factors that the Public Sector completed as a part of their investigation. And, most important any health and safety factors that have been identified, marked or otherwise controlled.

Figure 2: Incident Action Model
The above Incident Action Model, taken from the OSHA Disaster Site Worker Course with modifications, is provided as a visual representation of actions at a “Major Scene” and those that might be involved in the investigation of the scene as well as clean-up.

Additionally, it should be noted that the second curve indicates the investigation and clean-up activities. Investigation activities for either the public or private sector may begin at any time after the incident starts and the private sector may interface with the public sector at almost any time. As an example, a major fire or explosion occurs, the fire department investigative unit is dispatched to the scene while fire suppression and other emergency response activities are on going. Also, at that time, the building owner or insurance agent learns of the event. The agent makes contact with the company and they start to put the wheels in motion to have an adjuster or group of adjusters start moving to obtain resources to assist with an investigation or to provide assistance to the building owner or even to the investigation unit.

V. PRIVATE SECTOR MANAGEMENT MODEL
The development of a Private Sector Management Model for major investigations while following the basics of the ICS Model used in the Public Sector section had to be adapted for some very specific needs.

First, as a result of a variety of methodologies that may be utilized to complete the determination of the origin and cause of the incident, there is a requirement to meet the needs of other interested parties and still manage the overall operation.

Second, without a management plan for the investigation of the scene, we may not reach the overall goal of the investigation as described earlier in this paper.

Third, it also needs to be understood that the number of people required for the management process will vary depending on the size of the scene, how active the investigation is and how many people are working on the scene at any given time.

Fourth, the model provided is early in the review of the management process and additional refinements and changes may follow in the future. There is a limitation of the size and therefore the detail that can be provided in this paper.

**Figure 3: Private Sector Model**
As with the model provided for the Public Sector, specific roles and responsibilities for those at the “Section” level can be found by visiting the OSHA website. The “Operations Section” included in this model identifies the person that has direct management responsibilities for the investigation of the incident.

The following brief description of the role and responsibility of those in the investigative branch is intended to just highlight what they may be doing. Additional detail will be provided as the research continues.

**Operations Section**

1. Operations Section Manager: Responsible for coordinating and managing all of the functions identified in the section and communicating the progress of the incident and needs to the Incident Manager and other Branch Managers. Schedules briefings and manages information flow between each of the Branch Managers and Investigation Teams as organized.

2. Security Branch Manager: Organizes scene security to include; Scene Perimeter, Scene Entry and Exit, Escorts for Interested Parties and General Scene Security. The Security Manager is also responsible for the development and implementation of methodologies to complete the security function.

3. Evidence Branch Manager: Coordinates the collection, documentation and storage of evidence collected during the investigation. Supplies evidence technicians if needed to each of the Investigation Teams.

4. Origin and Cause Branch Manager: Coordinates the actual Investigation Process including; Scene Search, Scene Documentation, Interviews and Evidence Identification. Also, oversees the work completed by other interested parties that may be working in other areas of the building completing analysis of items of specific interest to their investigation as needed.

5. Construction/Clean Up Branch Manager: Coordinates the operations required to complete debris removal during the investigation including; Heavy Equipment, Equipment Operators, Specialized Tool and Tool Operators and the general labor force required to assist in the investigation and debris removal.

6. Safety Branch: Works directly with the Scene Safety Manager to provide a safe work area for investigators, interested parties and construction and clean up workers. In addition responsible for overseeing general scene safety, management of safety equipment and supplies, conducting safety briefings for prior to first time of scene entry and updates as hazards change and lastly for safety audits while the investigation progresses.

**VI. CONCLUSION**

The models provided as a part of this research paper were intended to provide the Fire and Explosion Investigation Community with some tools and guidance to assist in the event of a major fire or explosion incident. The models provide a framework for the development of specific methodologies and techniques to complete the tasks outlined. It is believed that these methodologies and techniques would be best developed by the individual user based upon local resources and capabilities. However, as indicated in the discussion, the items identified are function based and not people based. The number of people that will be needed to complete all of the functions identified will be determined by the Incident Manager as directed by the scene and
resources available. Both the Public Sector and Private Sector models are intended to expand and contract as responsibilities increase and resources are available. In theory, a single person could complete all of the functions identified and often do at smaller incident scenes. However, at a major incident scene with all of the management and investigative functions that need to be addressed without adequate resources and a sound management plan would not be very successful.

A second part of this research will be to develop a more comprehensive list or roles and responsibilities of each of the elements used in the models. These roles and responsibilities, once completed will further assist the fire and explosion investigation community to complete the incident investigation goals in a more efficient manner. Additionally, sample forms and tools to provide guidance for the Investigation Manager will also be developed.

End Notes


References

6. ICS, Fire Protection Publications, Oklahoma State University, 1983