I. Research Purpose

Fire departments\(^1\) respond to emergencies daily. The goal of every fire department is the safe and effective resolution of every emergency incident to which they respond. Emergencies are often dynamic and chaotic situations. Fire departments around the nation use the Incident Command System\(^2\) as a tool that brings order to emergency scenes. According to an applied research project written by Cole (2000, 203) “One of the most significant trends to occur in the emergency services field during the last quarter of the twentieth century has been the widespread adoption of the Incident Command System (ICS) as “the model tool for the command, control, and coordination of resources and personnel at the scene of emergencies (Federal Emergency Management Agency\(^3\) [FEMA], 1992”’. An effective Incident Command System is vital to safe and successful emergency scene management.

**Incident Command System (ICS)**

The Incident Command System originated from the California wildland firefighting program know as FIRESCOPE (Firefighting Resources of Southern California Organized for Potential Emergencies). This early version of the Incident

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\(^1\) For an additional fire service related ARP’s see Baum 1997; Rose 1996
\(^2\) The Incident Command System is also know as the Incident Management System
\(^3\) Federal Emergency Management Agency, a function within the US Department of Homeland Security that is charged with responding to Presidentially declared disasters.
Command System was developed as a result of several uncontrolled wildfires that occurred in southern California during the early 1970’s. “ICS resulted from the obvious need for a new approach to the problem of managing rapidly moving wildfires in the early 1970’s. At that time, emergency managers faced a number of problems, many of these has yet to be universally resolved” (Strumpf 2001, 2). FIRESCOPE aimed to address the following problems—too many people reporting to one supervisor, differing emergency response organizational structures, lack of reliable incident information, inadequate and incompatible communications, lack of structure for coordinated planning between agencies, unclear lines of authority, terminology differences between agencies and unclear or unspecified incident objectives (Strumpf 2001, 2). FIRESCOPE created a comprehensive plan aimed at the command and control of vast wildland fire incidents. FIRESCOPE implemented several important standards, which are still in use today (Lindell, Perry and Prater 2005).

Under FIRESCOPE all jurisdictions use a standard set of terminology to describe the names of units and their emergency scene function (Lindell, Perry and Prater 2005). Standardization of terminology is viewed as an important key to organizing jurisdictions that do not, under normal conditions, operate together. The use of common terminology eliminates the confusion that occurs when neighboring jurisdiction use differing terminology. FIRESCOPE also created the concept of functional specificity (Lindell, Perry and Prater 2005). Functional specificity means that each unit is tasked with a specific function and that unit knows their function before the incident ever occurs.

Along with common terminology and functional specificity, FIRESCOPE accounts for the uncontrolled expansion associated with most wildland fires. As the
incident expands, sectors or sub-units are created in order to keep a manageable span of control (Lindell, Perry and Prater 2005). During emergency operations a manageable span of control can be anywhere from three to seven subordinates but can be more or less depending on the severity of the situation (Lindell, Perry and Prater 2005). Keeping a manageable span of control allows for greater safety and operational effectiveness because the supervisor is able to stay focused on the tasks at hand.

In the early 1980’s, Chief Alan Brunacini of the Phoenix Fire Department, applied the principles created by FIRESCOPE and wildland firefighting to structural firefighting. This revised version of the Incident Command System is known as the Incident Management System (IMS) (Lindell, Perry and Prater 2005). Much like the wildland fire service, structural firefighters were responding to fires with little organization and no accountability. Chief Brunacini, took many of the principles used in FIRESCOPE and made them applicable to the smaller scale operations generally faced by structural firefighters (Perry 2003). “His philosophy toward firefighting and commanding firefighting operations was somewhat less formal and more ‘laid back’ than the formal method (the ICS) used in California.” (Coleman 1997, 8). Both FIRESCOPE and Brunacini’s version of the Incident Command System dominated fire department operations during the early 1990’s (Coleman 1997, 9). Despite agreement on the major issues of organization and accountability, there are some major differences between the two versions.

The first difference manifested itself in the duties of the first arriving officer (Coleman 1997). Both FIRESCOPE and Brunacini agreed that the first arriving officer must assume the role of Incident Commander (IC). The Incident Commander is the
individual who is designated in charge of the entire incident (NFPA\textsuperscript{4} 1561, 2007). Order is immediately established by the assumption of an Incident Commander at the start of the incident. FIRESCOPE insisted that the Incident Commander remain in a stationary command post and not participate in any hands on tasks. Brunacini felt the urgency of an emergency incident meant the first arriving officer could “pass” the duties of the Incident Commander to the next arriving officer if he or she felt their physical assistance was needed to resolve the emergency at hand (Coleman 1997).

Another difference between these two versions of the Incident Command System is outlined by each systems ability to expand. As stated earlier, Brunacini developed his version of the Incident Command System to address issues with structural firefighting (Green 2002). Structural firefighting incidents are, by their very nature, smaller in scale than wildland firefighting incidents. Brunacini designed his system to match structural firefighting needs and did not allow for the massive system expansion designed by FIRESCOPE (Coleman 1997). Other differences manifest themselves in terminology involving command responsibilities and functions.

Following the events of 911 the federal government began to recognize the benefits of an effective Incident Command System. As such, they created the National Incident Management System\textsuperscript{5} (NIMS). Like FIRESCOPE, NIMS was developed for use in major incidents stretching over several jurisdictions. The National Incident Management System incorporates many of the principles of both FIRESCOPE and the Incident Management System. “More recently, the ICS model has been incorporated into the National Incident Management System (NIMS), established by Homeland Security

\textsuperscript{4} National Fire Protection Association, creates standards for firefighting.

\textsuperscript{5} The National Incident Management System. A federally mandated program for the standardizing of command terminology and procedures.
6 Presidential Directive (HSPD)-5. This directive essentially declares the command structure as the US national standard, making adoption of the ICS model a prerequisite for any US agency receiving federal preparedness assistance beginning in 2005.” (Thomas, Hsu, Kim, Colli, Arana, and Green 2004, 19).

Although the Incident Command System was originally created to combat wildland and structural fires, it is important to remember that current Incident Command System theory recognizes the use of the Incident Command System at every emergency incident; not just fires. The Incident Command System is used at every incident to which the fire department responds (Coleman 1997). As part of the Superfund Amendments and Reauthorization Act (SARA) Title III, the federal government requires some form of the Incident Command System to be used at every hazardous material incident (IFSTA 2004). Buck, Trainor and Aguirre (2007, 6) described the use of the Incident Command System in “the Pentagon, North Ridge Earthquake, Oklahoma City Bombing, Atlanta Olympics Bombing and DeBruce Grain Elevator Explosion”.

The Incident Command System has been the subject of much revision since its inception in the 1970’s. Such revision has led to many similar but separate versions of the Incident Command System. “There are several versions of ICS (Goldfarb 1997)” (Buck, Trainor and Aguirre 2006, 1). The separate versions can produce confusion. Many jurisdictions either subscribe to one version or in many cases pick and chose principles from several versions to create their own. While implementation of the Incident Command System is important to emergency scene operations, most experts

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6 For additional ARP’s on the topic of homeland security and disaster management see Phillips 1998; Gatlin 2006; Ellis 2001; Hall 2000.
7 International Fire Service Training Association.
8 Refers to the events of 911
agree a universally standard Incident Command System is needed. Cole (2000, 212) maintains that the “common criticism of ICS is that there are considerable differences in how the system is implemented from one agency to another, and from one region to another”.

There is a current need for a standard Incident Command System assessment tool in order gauge an effective system. Shields and Tajalli (2006, 25) maintain that “gauging research asks ‘What should?’ (how close is process x to the ideal or standard?). The research purpose is to gauge ‘What should’ be done to improve an administrative process."

**San Antonio Fire Department**

With a population of just under 1.3 million, the City of San Antonio ranks 2nd largest in the state of Texas and 7th in the entire United States. The San Antonio Fire Department (SAFD) incorporates 50 fire stations and well over 1,000 firefighting personnel who service the city; a 51st station is scheduled to open in 2008. The San Antonio Fire Department is a highly professional organization that incorporates the Incident Command System into its emergency scene operations. A city and fire department the size of San Antonio’s has the responsibility of providing the best emergency service possible. An effective Incident Command System is necessary in order for the SAFD to operate at a high level.

**Research Purpose**

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9 For more information on the San Antonio Fire Department and the City of San Antonio visit www.cosa.gov
10 Based on 2006 Census
11 Based on 2006 Census
Fire department administrators and emergency professionals must be willing to recognize, identify and administer the strengths of an effective Incident Command System. The purpose of this applied research project is threefold. First, it will describe the ideal components of an effective Incident Command System obtained from the literature. Second, it will assess the San Antonio Fire Departments Incident Command System using the ideal type components. Third, it will provide recommendations for improving the San Antonio Fire Departments Incident Command System. A review of the literature identified five key components of an effective Incident Command System. The components include the responsibilities of the first arriving officer, responsibilities of the Incident Commander, overall scene safety, effective communications and professional development.

The creation of a model assessment tool that includes all five components is necessary. The model assessment tool will be used to gauge the overall effectiveness of the San Antonio Fire Departments Incident Command System. The conceptual framework table represents each component of the assessment tool along with the corresponding literature. There is a need for an Incident Command System assessment tool. “No universally accepted methods for objective evaluation of the function of the Incident Command System (ICS) in disaster exercises currently exist.” (Thomas, Hsu, Kim, Colli, Arana, and Green 2004, 14). This paper will attempt to meet this need.
II. Conceptual Framework

There is extensive literature on the Incident Command System. While experts agree on the importance of an effective Incident Command System there remains a need for a standard tool to assess the system. The remainder of this section is intended to address this need. The researcher will develop a practical ideal model of the Incident Command System which will be used to assess the effectiveness of the San Antonio Fire Departments Incident Command System. There are five components necessary for an effective Incident Command System described in the literature. “The categories of the practical ideal type do and thus can be treated as statements of expectation (or working hypotheses) that direct evidence collection – and can be supported or not supported by the evidence” (Shields and Tajalli 2006, 26).

The five components of an effective Incident Command System identified from the literature are outlined in the practical ideal model assessment tool. The components of the practical\textsuperscript{12} ideal Incident Command System model assessment tool are:

1. Responsibilities of the First Arriving Officer\textsuperscript{13}
2. Responsibilities of the Incident Commander
3. Overall Scene Safety
4. Effective Communications
5. Professional Development

\textsuperscript{12} “We use the term ‘practical’ to indicate that the criteria or model components are not perfect but subject to ‘revision’” (Shields and Tajalli 2006, 25).

\textsuperscript{13} Personnel experience with the Incident Command System has taught me that the first arriving officer is responsible for initiating the entire system.
Practical Ideal Model Assessment Tool Components\textsuperscript{14}

Responsibilities of the First Arriving Officer\textsuperscript{15}

The urgency of most emergencies creates confusion and chaos. The Incident Command System addresses this problem through the establishment of a single Incident Commander. The Incident Command System calls for the first arriving officer to assume the initial role of Incident Commander in an effort to bring immediate organization to what would be an unorganized scene (Perry 2003). Because of the immediate need for structural organization and control the first arriving officer is the best choice to assume the initial role of Incident Commander. “The philosophy is that there must always be one (and only one) IC at every incident scene, and it is the duty of arriving officers to assume command” (Perry 2003, 407).

Once the first arriving officer has assumed the role of Incident Commander, there are several decisions he or she must make in the initial moments of the incident. The first arriving officer must perform a quick scene size up, where he or she looks at the picture in front of them and determines strategy based on that initial picture and a risk assessment (Bigley and Roberts 2001). “When the first engine arrives, its captain takes a quick look around to size-up the situation, taking in such factors as hazards, weather, and safety in developing a plan of attack” (Jiang, Hong, Takayama and Landay 2004, 681).

The details of the incident are verbalized to incoming responders through an initial report. Brunacini (2002, 82) suggests that “the first-arriving responder who will

\textsuperscript{14} For additional examples of practical ideal type models see Vaden 200; Ley 2002; Sparks 2007
\textsuperscript{15} For additional supporting literature see Coleman 1997; National Fire Protection Association 2007, Buck Trainor and Aguirre 2006; Cole 2000; Green 2002; Hannestad 2005; Lindell, Perry and Prater 2005; Strumpf 2001.
assume the role of incident commander should advise dispatch of this fact by
broadcasting a standard initial radio report including the unit designation, arrival,
assumption of command, conditions and the name and location of that command post”.
Brunacini (2002, 82) gives the following example of the initial report, “Engine 1 on the
scene, north side of a medium-size commercial building with a working fire-Engine 1
will assume Ajax Command.” The immediate assumption of the role of Incident
Commander followed by the initial report is necessary to start the incident in a way that
creates organization and safety.

*Responsibilities of the Incident Commander*¹⁶

At every incident, regardless size and complexity, the Incident Commander must
perform six major responsibilities (Coleman 1997). The first five responsibilities are
often referred to as the Incident Commander’s “functions” (Hannestad 2005). The five
functions are known as command, operations, planning, logistics and administration¹⁷.
The sixth responsibility is customer service (Brunacini 2002). At most incidents the
Incident Commander can fulfill all six responsibilities by his or her self. “The ranking
officer of the first team on scene might assume the role of IC and carry out all ICS roles,
passing on the role of IC to higher-ranking officers arriving later on and assuming other
roles” (Jiang, Hong, Takayama and Landay 2004, 680).

When the incident escalates beyond the Incident Commander’s span of control,
the Incident Commander can delegate one or all of the roles to provide focus on the

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¹⁶ For additional supporting literature see Buck, Trainor and Aguirre 2006; Cole 2000; Green 2002; Lindell
¹⁷ Sometimes called finance
primary role of command\textsuperscript{18}. The responsibility of the command role is to focus on the entire incident keeping firefighter safety as the number one priority; command is responsible for the outcome of the entire incident (Brunacini 2002).

The Incident Commander manages the strategic aspects of the incident by fulfilling the role of operations. NFPA 1561 (2007, 5.10.1.3) states that “all supervisory personnel assigned to operations functions shall support an overall strategic plan, as directed by the incident commander, and shall work toward the accomplishment of tactical objectives.” If the Incident Commander has delegated the role of operations, it is the responsibility of operations to inform the Incident Commander of the strategic aspects of the incident. As with the role of command, operations must keep firefighter safety as his or hers paramount concern. As stated earlier the role of operations can usually be handled by the Incident Commander.

The Incident Commander fulfills the responsibility of planning by taking into account all technical aspects of the incident. “The planning officer is responsible for reviewing past and then identifying future needs of the incident and may be required to anticipate the future course of the incident” (Coleman 1997, 85). Planning is vital because of the often dynamic conditions found at most emergency incidents. The Incident Commander must be always looking at the past and planning for the future. The incident must never expand beyond the control of the Incident Commander.

Logistics is involved with resource allocation. “The logistics section shall provide services and support systems to all the organizational components involved in the incident including facilities, transportation, supplies, equipment maintenance, fueling,

\textsuperscript{18} Personnel experience with the Incident Command System has taught me that the role of command is the most important responsibility of the Incident Commander.
feeding, communications and medical services/responder rehabilitation” (NFPA 1561 2007, 5.10.3.1). Logistics makes sure all the tools and personnel are ready and available for use when needed.

**Administration** is involved in the financial aspect of the incident. Bigley and Roberts (2001, 1283) state that “the finance/administration section provides accounting, procurement, and cost analysis”. If the incident involved instances such as overtime pay or consultant compensation, the administrations section must account for such costs. “The incident commander shall assign finance/administration functions on the basis of the needs or complexity of the incident” (NFPA 1561 2007, 5.10.4.2)

The literature suggests **customer service**[^19] as a sixth responsibility of the Incident Commander. It is important to remember that the incident is not over just because the threat has been resolved. Many times people are greatly affected by the emergency incident that has occurred. It is the responsibility of the Incident Commander to not leave the victims helpless. The Incident Commander should do whatever is in their power to assure the victims receive the necessary help to recover from the effects of the incident (Brunacini 2002).

**Overall Scene Safety**[^20]

At its most basic level the Incident Command System is a safety tool. “NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, calls for IMS as part of overall scene safety at structure fires” (Coleman 1997, 16). With the assumption of an Incident Commander and subsequent established chain of command,

[^19]: Early Incident Command literature often mentions the issue of customer service as a side note, but more recent literature has stressed its importance to the completion of the system.

[^20]: For additional supportive literature see Brunacini 2002; Bigley and Roberts 2001; Buck, Trainor and Aguirre 2006; Cole 2000; Green 2002; Hannestad 2005; Jiang, Hong, Takayama and Landay 2004; Lindell Perry and Prater 2005; Perry 2003; Strumpf 2001.
uncontrolled freelancing is replaced with controlled tactics with clear objectives. The Incident Commander is in total control of the incident because he or she knows where everyone is and the task they are performing.

As a part of the overall scene safety the Incident Commander should assign a safety officer. The safety officer’s sole responsibility is to analyze the emergency scene and assure the safety of all first responders. According to NFPA 1561 (2007, C.2.1) “a safety officer shall be designated by the incident commander whenever the IC cannot perform this vital function due to the size or complexity of the incident.” The safety officer does not remain stationary. It is their job to move about the scene in a way that allows them to monitor the safety of the entire incident. “The safety officer shall recon and monitor the scene and report the status of conditions, hazards and risks to the incident commander” (NFPA 1561 2007, C.2.1).

Another tool used in the Incident Command System to insure the safety of working crews is a Personal Accountability Report (PAR). A PAR is initiated by the Incident Commander. The Incident Commander accomplishes a PAR by using a standard radio transmission to each company on scene in which they ask for a “PAR”. When the receiving company confirms the PAR, the Incident Commander knows that each member of that crew is accounted for. “The incident commander shall conduct a personnel accountability report (PAR) from each division or group supervisor whenever there is a change in conditions that could create an unsafe operations such as an ‘emergency traffic’ announcement to all companies to evacuate the building” (NFPA 1561 2007, C.2.1).
Along with the safety components described above, NFPA 1561 (2007, C.2.1) prescribes, an **operational retreat policy** as part of a safe Incident Command System. This is usually accomplished with a standard radio transmission and evacuation tone. When the tone is transmitted via a standard radio transmission, all companies on the fireground shall immediately remove themselves from the incident. The evacuation tone should be standard in the system to be effective.

The Incident Commander is an important part of the overall scene safety. The Incident Commander must never become overwhelmed. Hence, keeping a **manageable span of control**\(^\text{21}\) (Lindell, Perry and Prater 2005). During emergency operations a manageable span of control can be anywhere from three to seven subordinates but can be more or less depending on the severity of the situation (Lindell, Perry and Prater 2005). Keeping a manageable span of control allows for greater safety and operational effectiveness because the supervisor is able to stay focused on the tasks at hand; delegation is key.

In situations where firefighters will be operating in an atmosphere that is immediately dangerous to life and health (IDLH), 29 CFR\(^\text{22}\) 1910.134 requires increased safety. There should be a minimum of two firefighters on scene, fully equipped, whose sole purpose is to rescue other firefighters working in the IDLH atmosphere (NFPA 1561 2007, A.3.3.36). In the initial stages of the incident, the two person crew is commonly known as the **Initial Rapid Intervention Team**\(^\text{23}\) (IRIT). As the incident develops and more personnel arrive, the IRIT becomes a full crew of rescuers, designated as the **Rapid**

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\(^{21}\) Personal experience has taught me that the key to keeping a manageable span of control is the delegation of responsibilities.

\(^{22}\) Code of Federal Regulations

\(^{23}\) Also known as the Initial Rapid Intervention Crew (IRIC)
Intervention Team\textsuperscript{24} (RIT). As with IRIT, the RIT’s sole purpose is the rescue of firefighters working in the IDLH atmosphere. Implementation of both IRIT and RIT are necessary for a safe and effective Incident Command System.

\textit{Effective Communications}\textsuperscript{25}

When an incident breaks down it is most often the result of ineffective communications (Brunacini 2002). A uniform and controlled communications system is essential to an effective Incident Command System. The adoption of standard terminology is a key aspect of effective communications. Plain English should be used to describe the situation and give and receive orders. The use of “ten codes”\textsuperscript{26} is not recommended. “Clear text should be used for radio communications” (NFPA 1561 2007, 6.2.2). Coded terminology leaves room for misinterpretation and error. “Mixing common language and numbered (ten codes) signals can be very confusing and mysterious if all of the participants are not familiar with the meaning and the details” (Brunacini 2002, 143).

A designated radio channel should be assigned to each incident in order to avoid the confusion of multiple incidents communicating on the same channel. It is imperative that the Incident Commander control radio transmissions by responding to companies on the first call. An immediate response to the first call lets everyone on scene know that the Incident Commander is paying attention and in total control. By initiating and

\textsuperscript{24} Also known as the Rapid Intervention Crew (RIC)  
\textsuperscript{25} For additional supportive literature see Bigley and Roberts 2001; Buck, Trainor and Aguirre 2006; Cole 2000; Green 2002; Hannestad 2005; Jiang, Hong, Takayama and Landay 2004; Lindell, Perry and Prater 2005; Perry 2003; Strumpf 2001.  
\textsuperscript{26} Ten-codes, are code words used to represent common phrases in voice communication, particularly in radio communications.
controlling communications, the Incident Commander is giving the incident a strong command presence, which is necessary to establish and keep control (Brunacini 2002).

The use of benchmarks to inform the Incident Commander of incident progress is highly desirable. “Benchmarks are announcements that a particular activity or assignment has been completed.” (Coleman 1997, 298). When a unit gives the Incident Commander a standard benchmark, the Incident Commander becomes aware of the progress being made and can assign the unit to another task; always staying in control.

Professional Development 27

Incident command system training is essential for departments to be able to apply the system effectively. Research by Buck, Trainor and Aguire (2006, 21) concluded “ICS works well when official responders have trained in ICS and have a strong sense of community”. Clear Standard Operating Procedures (SOP’s) that outline the system are necessary to avoid confusion. “The incident commander determines which standardized assignments to utilize, depending on the situation. When an assignment is made, both the incident commander and assigned responder know what is expected, based on their knowledge of the written SOP” (NFPA 1561 2007, A.5.1.10).

To supplement the written word, training evolutions are necessary to allow firefighters to experience the Incident Command System first hand and learn from the experience. How the Incident Command System functions depends mostly on how well those who are using it understand it. Without proper training the Incident Command System is ineffective. NFPA 1561 (2007, 7.2.2) recommends that “team members shall be trained together with full-scale exercises and simulations of sufficient number to

develop their proficiency and allow them to maintain the necessary skills”. In essence how well the system functions is determined before the emergency incident ever occurs.

It is vitally important that everyone know what system is being used. The Standard Operating Procedures and the training should match one another. Contradiction from either source can lead to confusion and breakdown of the system.

Company officers are the individuals who will normally initiate and establish the position of Incident Commander. Therefore, along with Standard Operating Procedure familiarization and hands on Incident Command System training, an officer development program is needed to teach the strategic and tactical aspects that the Incident Command System depends on. Without the knowledge of the appropriate tactics to use for each situation, the Incident Commander may make strategic decisions that can be ineffective and dangerous.

An effective Incident Command System includes post incident critiques (Coleman 1997). Post incident critiques are necessary to outline the strengths and weaknesses of the system and how it was implemented at each particular incident. An immediate critique known as a “tailboard critique” can be very helpful (Coleman 1997). With the details of the incident still fresh in everyone’s mind, the aspects of the incident can be discussed with greater clarity. To supplement the tailboard critique a more in depth review of the incident should be discussed at the station in the days immediately following. Both critiques should be aimed at creating a better understanding of the Incident Command System and improving the departments use of it. Incident Command System training is a continuous process aimed at increasing knowledge of the system.

Conceptual Framework Table
The practical ideal type categories are outlined below in Table 2.1. As mentioned earlier, the five practical ideal type categories are the responsibilities of first arriving officer, responsibilities of the Incident Commander, overall scene safety, communications, and professional development. The combination of these five categories creates the assessment tool model.
### Table 2.1: Conceptual Framework Linking Ideal Type Categories to the Literature

<table>
<thead>
<tr>
<th>Conceptual Framework</th>
<th>Ideal Type Categories</th>
<th>Literature</th>
</tr>
</thead>
</table>
| **Responsibilities of First Arriving Officer** | • Assumption of Command (all incidents)  
• Size up  
• Determine strategy  
• Initial report | Perry (2003)  
Bigley and Roberts (2001)  
Jaing, Hong, Takayama and Landay (2004)  
Brunacini (2002)  
Coleman (1997) |
| **Responsibilities of the Incident Commander** | • Command  
• Operations  
• Planning  
• Logistics  
• Administration  
• Customer service | Hannestad (2005)  
Coleman (1997)  
Brunacini (2002)  
Jaing, Hong, Takayama and Landay (2004)  
NFPA 1561 (2007a)  
Bigley and Roberts (2001) |
| **Overall Scene Safety** | • Safety Officer  
• Personnel Accountability Report (PAR)  
• Operational retreat policy  
• Manageable span of control  
• Initial Rapid Intervention Team (IRIT)  
• Rapid Intervention Team (RIT) | NFPA 1561 (2007a)  
NFPA 1500 (2007b)  
Coleman (1997)  
Lindell, Perry and Prater (2005)  
Brunacini (2002)  
| **Effective Communications** | • Standard terminology  
• Designated radio channel  
• Controlling communications (Strong command presence)  
• Benchmarks | Brunacini (2002)  
NFPA 1561 (2007a)  
Coleman (1997) |
| **Professional Development** | • Incident Command System Standard Operating Procedures (ICS SOP’s)  
• Incident Command System training  
• Officer development program  
• Post incident critiques | Buck, Trainor and Aguire (2006)  
NFPA 1561 (2007a)  
Coleman (1997)  
Brunacini (2002) |
III. Methodology

The five components of the practical ideal model, developed for the Incident Command System, will be used to direct data collection during the assessment of the San Antonio Fire Departments Incident Command System. Each component will be assessed using specific research methodology.

Case Study

The research design selected for this paper is a case study. A case study is necessary to perform a comprehensive assessment of the San Antonio Fire Departments Incident Command System because no single research method would be sufficient. According to Yin (2003, 2), “the distinctive need for case study arises out of the desire to understand complex social phenomena. In brief, the case study method allows investigators to retain the holistic and meaningful characteristics of real-life events.” With case study research, multiple research methods are incorporated into one study.

The use of multiple research techniques is the strength of the case study approach. Instead of using one research method, such as survey research, a case study uses several research methods. Yin maintains that, “the need to use multiple sources of evidence far exceeds that in other research strategies, such as experiments, surveys, or histories.” The process of incorporating multiple methods into one case study is known as triangulation. “When you have really triangulated the data, the events or facts of the case study have been supported by more than a single source of evidence” (Yin 2003, 99). The San Antonio Fire Departments Incident Command System program can be viewed as a

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28 Vaden (2007, 34)
“case”. This case study uses document analysis, direct observation and structured interviews as techniques to collect data.

Table 3.1 summarizes the connection between the framework, data collection methods, and expected evidence\(^{29}\). When viewed as a whole, the research methods used provide a comprehensive assessment of the San Antonio Fire Departments Incident Command System.

### Table 3.1: Operationalization of the Conceptual Framework

<table>
<thead>
<tr>
<th>Operationalization Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ideal Type Categories</td>
</tr>
<tr>
<td>Responsibilities of First Arriving Officer</td>
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<tr>
<td></td>
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<tr>
<td></td>
</tr>
</tbody>
</table>

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\(^{29}\) Vaden (2007, 34)
<table>
<thead>
<tr>
<th>Responsibilities of the Incident Commander</th>
<th>Direct Observations</th>
<th>Audible initial reports observed</th>
<th>Radio Transmissions during multi-response incidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Command</td>
<td>-Document Analysis</td>
<td>-Command responsibilities outlined clearly</td>
<td>-Incident Command System Standard Operating Procedures -Administrative orders</td>
</tr>
<tr>
<td>-Planning</td>
<td>-Document Analysis</td>
<td>-Planning responsibilities outlined clearly</td>
<td>-Incident Command System Standard Operating Procedures -Administrative orders</td>
</tr>
<tr>
<td>-Administration</td>
<td>-Document Analysis</td>
<td>-Administration responsibilities outlined clearly</td>
<td>-Incident Command System Standard Operating Procedures -Administrative orders</td>
</tr>
</tbody>
</table>

**Table 3.1: Operationalization of the Conceptual Framework**

- **Direct Observations**: Direct observations are used to gather real-time data about the incident. It includes observing phenomena, actions, and behaviors directly.
- **Audible initial reports observed**: Audible initial reports observed provide initial information about the incident, which is crucial for quick decision-making.
- **Radio Transmissions during multi-response incidents**: Radio transmissions are critical for coordinating different teams and resources during a multi-response incident.
**Table 3.1: Operationalization of the Conceptual Framework**

<table>
<thead>
<tr>
<th>Overall Scene Safety</th>
<th>Document Analysis</th>
<th>Incident Command System Standard Operating Procedures</th>
<th>Administrative orders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety Officer</td>
<td>-Safety officer procedure identified clearly</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Personnel Accountability Report (PAR)</td>
<td>-Personnel Accountability Report procedure identified clearly</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Operational retreat policy</td>
<td>-Operational retreat policy identified clearly</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Manageable span of control</td>
<td>-Manageable span of control procedure identified</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Initial Rapid Intervention Team (IRIT)</td>
<td>-Initial Rapid Intervention Team procedure identified clearly</td>
<td>-</td>
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<tr>
<td>Rapid Intervention Team (RIT)</td>
<td>-Rapid Intervention Team procedure identified clearly</td>
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### Table 3.1: Operationalization of the Conceptual Framework

<table>
<thead>
<tr>
<th>Effective Communications</th>
<th>Document Analysis</th>
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<th>Direct Observation</th>
<th>Benchmark procedure outlined clearly</th>
<th>Radio Transmissions during multi-response incidents</th>
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</thead>
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<tr>
<td>-Designated radio channel</td>
<td>-Designated radio channel procedure outlined clearly</td>
<td>-Audible designation of radio channel observed</td>
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<tr>
<td>-Controlling communications (strong command presence)</td>
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<td>-Incident Command System Standard Operating Procedures</td>
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<tr>
<td>-Benchmarks</td>
<td>-Benchmark procedure outlined clearly</td>
<td>-Audible benchmarks observed</td>
<td>-Incident Command System Standard Operating Procedures</td>
<td>-Administrative orders</td>
<td>-Radio Transmissions during multi-response incidents</td>
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</tbody>
</table>
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<tr>
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</thead>
<tbody>
<tr>
<td></td>
<td>-Document Analysis</td>
<td>-Structured Interview</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>-How do you familiarize yourself with the San Antonio Fire Departments Incident Command Standard Operating Procedures? (Q #2)</td>
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<tr>
<td>-Incident Command System training</td>
<td>-Document Analysis</td>
<td>-Existence of Incident Command System training procedure</td>
<td>-Incident Command System Standard Operating Procedures -Administrative orders</td>
<td>-Firefighters and Officers</td>
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<td>-Structured Interview</td>
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<td>-How would you describe the adequacy of the San Antonio Fire Departments Incident Command Training? (Q #3)</td>
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</tr>
<tr>
<td>-Officer development program</td>
<td>-Document Analysis</td>
<td>-Existence of officer development program</td>
<td>-Incident Command System Standard Operating Procedures -Administrative orders</td>
<td>-Officers</td>
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<td></td>
<td>-Structured Interview</td>
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<td></td>
<td></td>
<td>-How would you describe the adequacy of the San Antonio Fire Departments officer development program? (Q #4)</td>
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</tr>
</tbody>
</table>
Table 3.1: Operationalization of the Conceptual Framework

<table>
<thead>
<tr>
<th>Professional Development (cont.)</th>
<th>Document Analysis</th>
<th>Post incident critique procedure identified clearly</th>
<th>Incident Command System Standard Operating Procedures</th>
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<tr>
<td>-Post incident critiques</td>
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<td>-Describe your experience with post incident critiques? (Q #5)</td>
<td>-Administrative orders</td>
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<tr>
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<td></td>
<td>-Firefighters and Officers</td>
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</tbody>
</table>

Document Analysis

Document analysis is one of the three research methods selected for this case study. According to Yin (2003, 87), “the most important use of documents is to corroborate and augment evidence from other sources.” Document analysis has many strengths. Documentation tends to be stable, which means it can be reviewed repeatedly. Documents contain exact information and tend to cover a long period of time and events. Document analysis does have some weaknesses including irretrievability and the reporting bias of the originating author.

Document analysis will be used to assess all five ideal type categories. Document analysis will be used to confirm the existence of first arriving officer and Incident Commander procedures. Document analysis will also be helpful in confirming scene safety, communications and professional development procedures. This will include

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30 Yin (2003, 86) Figure 4.1
31 Yin (2003, 86) Figure 4.1
the study of the San Antonio Fire Departments Incident Command System Standard Operating Procedures. All administrative orders utilized by the administration to supplement the departments Standard Operating Procedures will also be examined.

**Sampling: Document Analysis**

The researcher will select the documents to be analyzed with the help of knowledgeable professionals within the San Antonio Fire Department. In this case, there is a limited amount of documentation available to the researcher. The limited amount of documentation combined with the input of knowledgeable professionals within the San Antonio Fire Department should make the sample representative. As stated earlier, documents including Incident Command System Standard Operating Procedures and administrative orders will be analyzed. These documents will be included in the final applied research project as part of the appendix.

**Direct Observation**

Direct observation will also be used to assess the San Antonio Fire Department Incident Command System. Direct observation, in this case, will be limited to the analysis of department radio transmissions. “The observations can range from formal to casual data collection activities” (Yin 2003, 92). By observing the evidence first hand the researcher is able to uncover valuable information they may not have found using other research methods. “If a case study is a new technology, for instance, observations of the technology at work are invaluable aids for understanding the actual uses of the technology or potential problems being encountered” (Yin 2003, 93). Direct observations provide the benefit of allowing the researcher to witness the events in real

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32 Vaden (2007, 41)
A weakness of direct observation is that it can be time consuming and costly. On scene radio transmissions will be monitored for the purpose of identifying the use of first arriving officer responsibilities, scene safety procedures and effective communications.

Sample: Direct Observation

Radio Transmissions of the Incident Command System are best observed when multiple fire units respond. When more than one unit responds, the fire companies are required to communicate with each other via radio transmissions. The Incident Command System requires all parts of the system to be verbalized over the radio. Radio transmissions are a great way to observe the Incident Command System because of the required transmissions. The Incident Command System relies heavily on radio communication thus making radio observations an excellent way to observe the system in action. Radio observations will be used to assess the model components of first arriving officer responsibilities, scene safety procedures and effective communications.

Radio transmissions of multi-unit responses will be observed over a period of one month. On every third day, a San Antonio Fire Department radio will be monitored for multi-unit dispatches. On each day of observation the radio will be monitored for a 12 hour period; from 9:00 am to 9:00 pm. Emergencies occur on a completely random basis. As such, it is impossible to determine the exact number of observable responses to be captured in the one month period. “In each random selection, each element has an

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33 Yin (2003, 86) Figure 4.1
34 A total of ten days will be observed over the one month period.
35 A total of 120 hours of radio transmissions will be observed.
36 Personal experience indicates anywhere from twenty-five to thirty-five multi-unit responses will have the chance of being observed.
equal chance of selection independent of any other event in the selection process” (Babbie 2001, 186).

Multi-unit response dispatches will be observed in real-time. Because all San Antonio Fire Department radio dispatches are transmitted on the same frequency, the entire department will have an equal chance of being observed. Pen and paper will be utilized to record the details of each observable incident. As stated earlier, the Incident Command System relies heavily on radio communication. All parts of the system must be communicated over the radio. Fulfillment of each component of the model is easily observed due to the necessary radio transmissions. If any component being observed is not transmitted over the radio, then it has not been completed. The audible assumption of command component, being observed under the first arriving officer category, would be fulfilled by the following transmission example:

- 1st arriving officer: “Engine 8 is on scene assuming command.”

In this example the Engine 8 has arrived on scene and the officer has taken command of the incident. If Engine 8’s officer had not stated that fact over the radio, then the first arriving officer would have failed to complete his duties. The above example will hold true for every component observed.

**Structured Interviews**

Structured interviews will also be used to assess the San Antonio Fire Departments Incident Command System. Structured interviews are important to the completion of a comprehensive program assessment. “One of the most important sources of case study information is the interview” (Yin 2003, 89). Structured interviews are valuable because the researcher is able to focus the questions directly on the case study
topic. The focused questions can be presented in open-ended form to encourage more insight into the topic. According to Yin (2003, 90), “the interviews may still remain open-ended and assume a conversational manner, but you are more likely to be following a certain set of questions derived from the case study protocol.” Weaknesses of structured interviews include question and response bias along with reflexivity. Reflexivity occurs when the interviewee gives what the interviewer wants to hear.

Structured interview questions have been developed from the conceptual framework. Questions are aimed toward the assessment of the responsibilities of the Incident Commander and professional development. Question #1, assesses the customer service responsibility of the Incident Commander. Question #2, addresses the San Antonio Fire Departments Incident Command System Standard Operating Procedure. Question #3, was created to assess the Incident Command System training proficiency. Question #4 is geared towards officer development. Finally, Question #5, examines the issue of post incident critiques.

**Sample: Structured Interviews**

The sample will include twenty firefighters and twenty officers within the San Antonio Fire Department. Quota sampling will be utilized. According to Babbie (2001, 180), “quota sampling addresses the issue of representativeness.” Quota sampling will insure that firefighters and officers throughout the department are interviewed. Babbie defines quota sampling as, “a type of nonprobability sampling in which units are selected on the basis of prespecified characteristics, so that the total sample will have the same distribution of characteristics assumed to exist in the population being studied.”

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37 Yin (2003, 86) Figure 4.1
38 The term “Officers” will include the ranks of engineer, lieutenant, captain, and chief
39 Vaden (2007, 40)
Interview participants will be selected from a database that includes the names of all firefighters and officers in the San Antonio Fire Department. Names will be selected randomly based on the role of a dice.

**Statistics**

Simple descriptive statistics will be used to summarize the collected data.

**IV. Human Subjects Protection**

There appears to be no foreseeable risks or discomforts to the subjects; all interviewees will be volunteers. There will be no benefit given to the interviewees. All interviewee information will be kept confidential and will only be known by the researcher. The overall nature of this research does not pose risk of harm to any participants.
Bibliography


National Fire Protection Association (NFPA), 2007. 1500: Standard on Fire Department Occupational Safety and Health Program. NFPA standard committee


United States Census, 2006


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**Structured Interview Questions**

1. Describe the current customer service philosophy for the San Antonio Fire Department.

2. How do you familiarize yourself with the San Antonio Fire Departments Incident Command Standard Operating Procedures?
3. How would you describe the adequacy of the San Antonio Fire Departments Incident Command Training?

4. How would you describe the adequacy of the San Antonio Fire Departments officer development program?

5. Describe your experience with post incident critiques?