The background image shows two firefighters in full protective gear, including helmets and oxygen tanks, working inside a structure. One firefighter is on the left, holding a tool, and the other is on the right. The scene is filled with smoke and debris, suggesting a fire investigation or rescue operation. The text is overlaid on this image.

**Colerain Township**  
**Department of Fire and Emergency Medical Services**

***Investigation Analysis  
of the  
Squirrelsnest Lane  
Firefighter Line of Duty Deaths***

***April 4, 2008***

**G. Bruce Smith**  
Director and Fire Chief





# Colerain Township

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## Fire Chief's Statement

April 4, 2008 Colerain experienced the loss of two firefighters in the Department's first line of duty deaths in over thirty-years. The tragic deaths of Captain Robin Broxterman and Firefighter Brian Schira have dramatically affected the members of our organization along with those fire and emergency medical service providers throughout the region.

During the last two years our Investigation Team conducted a comprehensive review of every element of the incident so we might better prevent these tragedies in the future. I would like to thank the dedicated members of the Team for their professionalism and their tireless efforts throughout this difficult period.

Firefighting is an inherently dangerous occupation which requires intense organizational and individual effort to mitigate the risks our members face. Critical decision making must effectively take place in the very compressed time frame of the firefighting environment. This report places great emphasis on the situational awareness necessary to manage risk in this dangerous environment.

As an organization, we take great pride in our long history of intense training, our significant experience with fire ground management, and our dedication to firefighter safety. With the completion of this report, we rededicate ourselves to these efforts.

To the members of our organization, we appreciate your support and your professionalism throughout this effort and with the implementation of the many changes in both our training and our operational procedures. We ask that you continue the focus and dedication toward your individual safety and that of your team.

To the Board of Trustees of Colerain and the administrative staff, we cannot thank you enough for your support through the years and since this event to allocate those resources necessary to provide outstanding emergency services to our community.

To the public safety agencies throughout the area that assisted us in the days immediately following the tragedy, we could not have made it through that difficult time without your support.

Finally, to the families of Robin and Brian, words cannot express the deep sorrow we have in our hearts for the loss of these two talented young people. We pledge to honor their professionalism, their dedication to the organization, and their loss by learning from this tragedy. We have recharged our efforts to improve firefighter safety by implementing the appropriate changes and by sharing our lessons learned throughout the fire service.

G. Bruce Smith  
Fire Chief



***Investigation Analysis  
of the  
Squirrelsnest Lane  
Firefighter Line of Duty Deaths***

Prepared by:

**Frank W. Cook, Battalion Chief**

**and**

**Steven G. Conn, Captain**



**Colerain Township Department of Fire and Emergency Medical Services  
3251 Springdale Road  
Colerain Township, Ohio 45251-1505  
(513) 825 - 6143**



## EXECUTIVE SUMMARY

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On Friday, April 4, 2008 at 06:13:02 hours, what began as a routine response for Engine 102 to investigate a fire alarm activation at 5708 Squirrelsne Lane, Colerain Township, Ohio resulted in the deaths of Captain Robin Broxterman and Firefighter Brian Schira. Upon their arrival at the scene of the two-story wood framed, residential building *working fire* conditions existed in the basement. The initial attack team consisted of Broxterman, Schira, and one other firefighter. The team advanced a 1¾-inch attack hose line through the interior of the building for fire control. Even though, they were provided with some of the most technologically advanced protective clothing for structural firefighting and self-contained breathing apparatus, it appeared that Broxterman and Schira were overwhelmed by severe fire conditions in the basement. During their attempt to evacuate the building, the main-level family room flooring system in which the two were traveling on collapsed into the basement trapping the firefighters.

As a result of what occurred that morning, Fire Chief G. Bruce Smith took immediate action and ordered a thorough examination by an internal department fact finding committee of the events, practices, procedures and training that led up to April 4<sup>th</sup>. On July 11, 2008, the department released its preliminary report that described the events of that fateful morning as they unfolded. Following the issuance of the preliminary report, a subsequent final report committee was appointed and tasked with analyzing the incident in its entirety and producing a more comprehensive report.

The final report committee's mandate was to identify direct and indirect factors that contributed to this tragedy, develop findings on specific actions and decisions, and provide recommendations that would ensure lessons learned would be effectively communicated to prevent future similar occurrences. The Department acknowledged that identifying lessons learned were but the first step in bringing about change; but what was key, was that the resulting changes be institutionalized. To that end, committee members reviewed hundreds of pages of reports, written and interview statements, documentation and photographs, held dozens of meetings, and reviewed and transcribed audio recordings.

The investigation of this incident provided a number of findings and recommendations that should be considered by Colerain's fire department, as well as other fire department organizations. The examination encompassed issues that related to building construction, firefighting tactics, command and control, situational awareness, communications, training, firefighting equipment and the individual responsibility of firefighters of the Colerain Township Department of Fire and Emergency Medical Services (Colerain Fire & EMS). In addition, a segment of the examination included a review of the individual and group affects following such an event, and the measures initiated that attempted to ensure individual, family and organizational wellness.

## EXECUTIVE SUMMARY

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The following factors were believed to have *directly* contributed to the deaths of Captain Broxterman and Firefighter Schira:

- A delayed arrival at the incident scene that allowed the fire to progress significantly;
- A failure to adhere to fundamental firefighting practices; and
- A failure to abide by fundamental firefighter self-rescue and survival concepts.

Although the aforementioned factors were believed to have directly contributed to their deaths, they might have been prevented if:

- Some personnel had not been complacent or apathetic in their initial approach to this incident;
- Some personnel were in a *proper state of mind* that made them more observant of their surroundings and indicators;
- The initial responding units were provided with all pertinent information in a timely manner relative to the incident;
- Personnel assigned to Engine 102 possessed a comprehensive knowledge of their *first-due* response area;
- A 360-degree size-up of the building accompanied by a risk - benefit analysis was conducted by the company officer prior to initiating interior fire suppression operations;
- Comprehensive standard operating guidelines specifically related to structural firefighting existed within the department;
- The communications system users (on-scene firefighters and those monitoring the incident) weren't all vying for limited radio *air time*;
- The communications equipment and accessories utilized were more appropriate for the firefighting environment;
- Certain tactical-level decisions and actions were based on the specific conditions;
- Personnel had initiated fundamental measures to engage in if they were to become disoriented or trapped inside a burning building; and
- Issued personal protective equipment was utilized in the correct manner.

This report examined the events of April 4<sup>th</sup> with the benefit of hindsight, while seeking to be independent, impartial, and thorough. From the beginning, Colerain Fire & EMS has been committed to share our findings with others in the hope that it may prevent another such event. Our aim was not to assign blame, but rather to provide the fullest

## EXECUTIVE SUMMARY

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account of the events that surrounded this incident and provide recommendations that would enhance firefighter safety and future fire protection delivery.



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## FOREWARD

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The completion and publication of this final LODD report closes another segment of a long but determined healing process for the Colerain Township Department of Fire and EMS. Although this is not the first firefighter line of duty death that has occurred in the history of Colerain Township it has been 31-years since our last.

The Colerain Township Department of Fire and EMS was formed after two very progressive organizations realized the quickly changing dynamics of family life in the community. The time available to dedicate to being a volunteer firefighter was slowly diminishing and giving way to family commitments. The department was the first in the area to embrace the concept of a combination fire department. This sudden shift from a predominantly volunteer organization created several new and challenging hurdles to overcome. Pride in their department and personal determination were key factors in personnel overcoming these challenges and allowing the organizational progress. That same pride and determination is still very prevalent today in each and every member of this organization.

A special heartfelt thank you to District Chief Tom Lakamp from the city of Cincinnati Fire Department who's guidance and assistance from early on in the process to the present time has been invaluable.

To Battalion Chief Frank Cook, who with assistance from Captain Steve Conn, was charged with the responsibility of assembling the final report, you have my sincere respect and admiration for your unwavering commitment to a comprehensive and thorough document.

To the members of the investigation team and those who played key supportive roles in this two-year process, you have my sincere thanks for an admirable job well done.

To all the members of our organization, in time each of you will find a way to understand or cope with what was God's plan. Although I cannot explain to you why the events of April 4th, 2008 occurred I can tell you that all of you will emerge from this event even stronger in your conviction to the fire service because you are members of the Colerain Township Department of Fire & EMS a very proud and professional organization.

Sincerely,



Richard E. Niehaus  
Assistant Fire Chief, Administrative Services



# INTRODUCTION

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## Introduction

This firefighter line of duty deaths investigation analysis document is a comprehensive and factual review of the April 4, 2008 building fire incident at 5708 Squirrelsnest Lane, Colerain Township, Ohio that claimed the lives of Captain Robin Broxterman and Firefighter Brian Schira. The information contained within this document is the *final* product of the Colerain Township Department of Fire and Emergency Medical Service's internal investigation, which examined every facet of the Squirrelsnest Lane fire incident during the past 24-months.

The investigation began the morning of the incident as soon as the scene was stabilized. Assigned to command the investigation process was Colerain's Assistant Fire Chief Richard Niehaus. Assistant Chief Niehaus was assisted by District Chief Thomas Lakamp of the Cincinnati Fire Department whom provided *immediate* guidance and resources during the initial stages of the investigative process. District Chief Lakamp afforded the department his knowledge and experience in the area of firefighter line of duty death investigations based on his involvement with Cincinnati's loss of Firefighter Oscar Armstrong in 2003.

Following the funeral service for Captain Broxterman and Firefighter Schira, the department continued the investigative process with the establishment of an interdepartmental LODD Fact Finding Committee comprised of the following appointed department personnel:

### Committee Chair

Assistant Chief Richard Niehaus, Colerain Fire & EMS – Administration

### Committee Advisor

District Chief Thomas Lakamp, Cincinnati Fire Division – Operations Bureau

### Committee Personnel

Battalion Chief Frank Cook, Colerain Fire & EMS – Operations Division  
Battalion Chief Chuck Palm, Colerain Fire & EMS – Operations Division  
Division Chief Greg Brown, Colerain Fire & EMS – Operations Division  
Division Chief Allen Walls, Colerain Fire & EMS – Training Division  
Captain Steven Conn, Colerain Fire & EMS – Operations Division  
Captain Darian Edwards, Colerain Fire & EMS – Operations Division  
Captain John McNally, Colerain Fire & EMS – Operations Division  
Firefighter Jennifer Dransman, Colerain Fire & EMS – Training Division  
Firefighter Paul Riedel, Colerain Fire & EMS – Operations Division  
Firefighter Brett Hammons, Colerain Fire & EMS – Operations Division  
Firefighter Joe Stallo, Colerain Fire & EMS – Operations Division  
Firefighter Matthew Vangen, Colerain Fire & EMS – Operations Division

## INTRODUCTION

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The committee convened on April 25, 2008. The primary objective of the committee's investigation and subsequent preliminary report was to collect evidence and examine the events surrounding the incident, particularly those that led to the deaths of Captain Broxterman and Firefighter Schira. The preliminary report was issued July, 11, 2008, which can be reviewed in its entirety in Appendix A.

The National Institute for Occupational Safety and Health (NIOSH) performed an independent investigation of the Squirrelsnest Lane fire incident. Fact Finding Committee members worked in conjunction with NIOSH investigators during their visit to obtain information during interviews with key personnel who operated on the incident scene. NIOSH released its report in August of 2009, which can be reviewed in Appendix B.

Following the issuance of the preliminary report, a second committee was appointed to more thoroughly scrutinize the evidence and produce the final report. The final report committee was comprised of the following appointed personnel:

Committee Chair

Battalion Chief Frank Cook

Committee Personnel

Assistant Chief Richard Niehaus

Division Chief Allen Walls

Captain Steven Conn

Captain John McNally

The final report committee was charged with reviewing the incident in its entirety from the original receipt of the initial alarm through the critical incident debriefing and follow-up. The efforts of this committee are contained in this document. This document contains the committee's findings and recommendations, which are intended to correct identified organizational deficiencies and to be utilized as an educational tool for the fire service to promote safety during emergency operations and prevent the loss of life, especially firefighter lives.

This document examines and analyzes aspects that reach beyond the scope of the NIOSH report. To prevent another tragic incident, a critical self-assessment of the fire department was necessary. The content of this document represents hundreds of hours of effort to analyze firefighting and rescue operations and recommend needed improvements. These organizational improvements range in complexity and many will have budgetary impacts that will be impossible to achieve in a single fiscal year. However, the document provides the framework for improvements that, when enacted,

## INTRODUCTION

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will improve firefighter safety and elevate service delivery to the citizens and visitors of Colerain Township.

The committee reviewed a wide variety of documentation and records during this phase of the investigation. Information reviewed included the following:

- Audio recordings and transcripts (911 telephone calls, radio communications, etc.);
- Photographs;
- Personal protective clothing and equipment;
- Standard Operating Guidelines;
- Training and education records and standards;
- Written statements from firefighting personnel who operated at the incident scene; and
- Various investigative reports associated with the incident (e.g., coroner's report, law enforcement reports, and origin and cause report).

In addition, members worked with manufacturer representatives who analyzed various aspects of the personal protective clothing and equipment utilized.

This document is organized into 14 chapters and eight appendices. Each chapter is divided into various sections that provide an overview and background information, specific discussion information relative to the incident, findings, and where applicable, recommendations for future action. The appendices include: Colerain Fire & EMS's Preliminary Report, the NIOSH Firefighter Fatality report, transcribed radio transmissions, analyses of the personal protective clothing and equipment worn and used by each deceased firefighter. All photos, images and diagrams are property of Colerain Fire & EMS unless otherwise noted.



## DEDICATION

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The deaths of Captain Robin M. Broxterman and Firefighter Brian Schira have been a profound loss not only to their parents, family and this organization, but also to the larger fire service community. In order to prevent these tragic losses in the future, we must first understand how and why our sister and brother firefighters died. We must learn from their incident and take that knowledge forward.

If it was possible, what would these firefighters tell us today that might prevent a similar death of a firefighter in the future? What would they want us as firefighters, company officers and chief officers to know about the circumstances that lead to their deaths and the things we (and they) might have done to alter the most tragic of outcomes?

As part of the review process, we had the opportunity to speak with co-workers, and we are grateful for the insight, perspective and memories they so generously shared. From the information that was made available for review, it was evident that these two individuals were well-loved in life, and greatly missed in death.

Every line of duty death of a firefighter in the United States is significant. This investigative analysis document is dedicated to Captain Broxterman and Firefighter Schira, their families, friends and the community whose lives were forever changed. In working to improve the health and safety of all United States firefighters, we have much to learn from the supreme sacrifice of these two individuals, who they were in life and in death. We honor their memories.



***Captain Robin M. Broxterman***



***Firefighter Brian Schira***



## ACKNOWLEDGEMENTS

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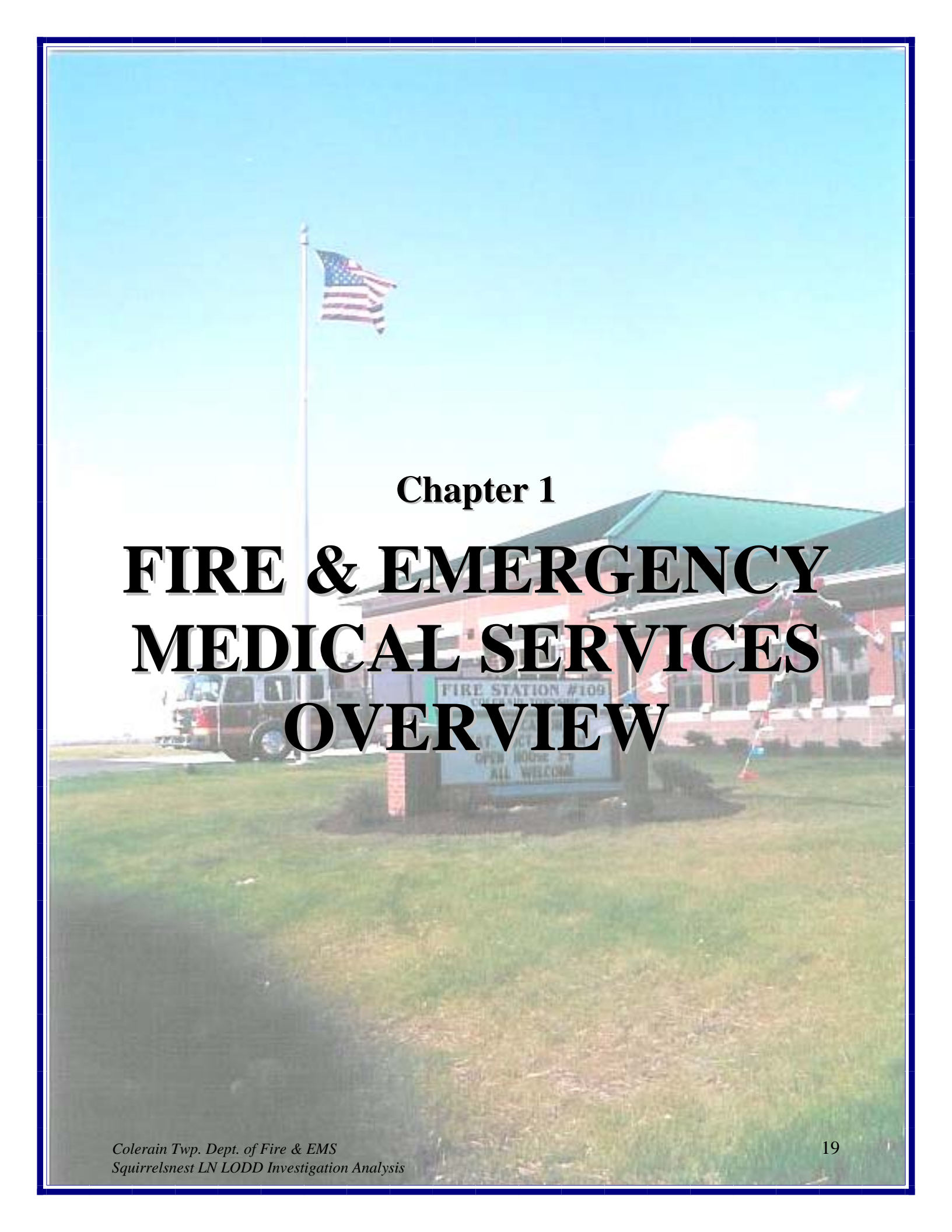
The Township Trustees and personnel of the Colerain Township Department of Fire and Emergency Medical Services gratefully acknowledge the support received from the former State Fire Marshal Michael Bell and the Ohio Fire Marshal's Office, Ohio Fire Chief's Association, the Hamilton County Fire Chiefs Association and Cincinnati Fire Chief Robert Wright and the entire Cincinnati Fire Department, during and after the Squirrelsnest Lane tragedy.

For coverage of Colerain Fire Stations, we thank all of the Hamilton and Butler County Fire Departments.

For assistance with the Memorial Service for Captain Broxterman and Firefighter Schira, we thank the City of Cincinnati Mayor Mark Mallory, Cincinnati City Manager Milton Dohoney, Cincinnati Fire Department's Local 48 Bereavement Team, Cincinnati Police Chief Thomas Streicher and the Cincinnati Police Department, Hamilton County Sheriff Simon Leis, Jr. and the Hamilton County Sheriff's Department, Colerain Township Police Chief Daniel Meloy and the Colerain Township Police Department, Bruce McClain and the Colerain Township Public Works Department, Gwen Mooney Funeral Home and Spring Grove Cemetery, Southwest Ohio and Northern Kentucky International Association of Professional Firefighters Locals, Mike Fronimos, Hebron, Kentucky Fire Protection District, and all the fire departments and businesses that participated and provided support during and after the service.

For the immeasurable support, sympathy, and concern received from the community of Colerain Township and across the United States for all of us in the Colerain Fire & EMS organization, we thank you.





# **Chapter 1**

# **FIRE & EMERGENCY MEDICAL SERVICES OVERVIEW**



## **FIRE AND EMERGENCY MEDICAL SERVICES OVERVIEW**

---

Colerain Township is located approximately 10 miles northwest of Cincinnati, Ohio. Colerain Township ranks as one of the largest townships in the State in terms of area and population. Located in northwest Hamilton County, the Township's population is approximately 61,000 and encompasses approximately 45-square miles. The communities of Bevis, Dunlap, Groesbeck, Northbrook, Northgate, Peach Grove, Pleasant Run, and Skyline Acres, as well as many others are served. Colerain has a wide range of occupancies including low-rise retail, commercial, industrial, single-family residences, and multi-family apartment and condominium complexes.

In Ohio, public services are divided up between state, municipal, county, and township governments. Local township government addresses concerns regarding the maintenance of public roads, police protection, fire protection, maintenance of parks and some recreational facilities, cemeteries, and zoning restrictions.

Colerain Township is primarily a suburban and rural community whose policy-making authority is vested in an elected three-member Board of Trustees who oversee all township functions and services. A Township Administrator, selected by the Trustees, oversees the day-to-day business of the Township Government. The Township Fiscal Officer, also an elected official, is responsible for all Township accounts and transactions.

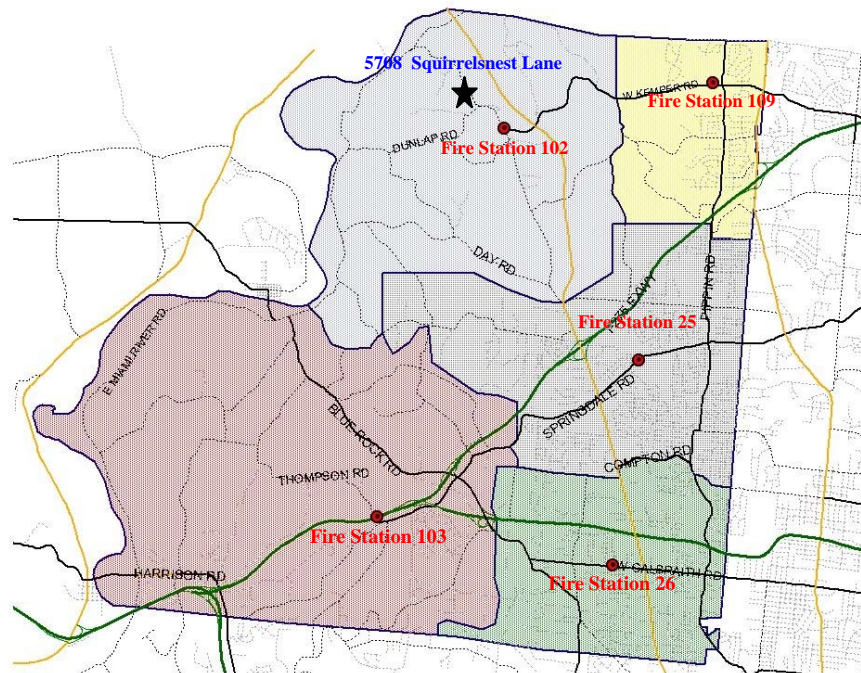
Since its formation as a result of a merger between the Groesbeck and Dunlap Fire Departments in 1975, the Colerain Township Department of Fire and Emergency Medical Services (Colerain Fire & EMS) has built a strong reputation for serving the citizens and visitors of Colerain Township. Colerain Fire & EMS provides a full range of services to the community, including: emergency response to fire, technical rescue and medical incidents, public assistance services, public education and code management services. The department is an organization of highly-trained professionals that serve with excellence, dedication, and pride. The personnel of Colerain Fire & EMS have consistently demonstrated a commitment to saving lives, protecting property and the environment, and improving the quality of life for residents and visitors, by providing rapid and reliable services in all emergency and non-emergency activities.

Colerain's fire and emergency medical services utilizes a *combination-system* of staffing operating under the direction of the Fire Chief, employing 56 career and 120 part-time paid uniformed personnel, and two career civilian personnel. The fire chief, deputy fire chief, two assistant fire chiefs, three battalion chiefs and five division chiefs are responsible for administrative and command functions. Line officers (an individual in charge of a team of firefighters and their responding apparatus) positions are comprised of several captains and two lieutenants.

## FIRE AND EMERGENCY MEDICAL SERVICES OVERVIEW

Fire protection and emergency medical services are delivered from five fire stations by five engine companies, one ladder company, one heavy rescue company, two water tanker (tender) units, one battalion chief, and several support and reserve units.

*Figure 1: Colerain Twp. fire station distribution.*



Emergency medical care of basic and advanced life support are provided by two paramedic non-transport units, four transporting ambulances, and by first response advanced life support engine companies.

The fire-protection services provided by Colerain Fire & EMS, as rated by an insurance industry advisory company is a *Class 2*. This classification assigned by the Insurance Services Office Inc. (ISO), known as the Public Protection Classification program assesses the fire-protection efforts in a particular community. ISO collects information on municipal fire-protection efforts in communities throughout the United States. In each of those communities, ISO analyzes the relevant data using its Fire Suppression Rating Schedule. The company then assigns a Public Protection Classification from 1 to 10. Class 1 generally represents superior property fire protection, and Class 10 indicates that the area's fire-suppression program doesn't meet ISO's minimum criteria.

# **FIRE AND EMERGENCY MEDICAL SERVICES OVERVIEW**

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## **Apparatus Types**

### Engines (Pumping Apparatus)

The department currently staffs five National Fire Protection Association (NFPA) designated *triple combination* pumpers and two pumping apparatus in *reserve*. A reserve apparatus is placed into service when another apparatus is out of service. These apparatus are equipped with a fire pump, hose complement, and water tank. Colerain Fire & EMS' fire engines are also given a Class-A designation by ISO.

The units are staffed with at least four firefighting personnel: one captain, who functions as the supervisor in charge of the company; one fire apparatus operator (FAO); and two firefighters. As part of this four-person complement, these engines are always staffed with at least one paramedic, allowing each company to operate as both a fire suppression and first response advanced life support (ALS) unit.

The role of the engine company during fire suppression efforts is to apply water through a variety of fire hose and associated appliances onto the fire in order to lower the temperature of the fuel below its ignition temperature.

### Aerials (Ladder Apparatus)

The department currently staffs one ladder company with four to five firefighting personnel and one aerial apparatus in reserve. Both apparatus types are 110-foot aerial ladders carried on straight chassis.

The role of the ladder company during fire suppression efforts is to provide forcible entry; utility control, vertical and positive pressure ventilation (PPV), which aids in fire suppression efforts conducted by the engine companies; search and rescue; salvage and overhaul; elevated work above ground level on ladders; and elevated master streams for defensive firefighting operations.

### Heavy Rescue

The department currently deploys one heavy rescue apparatus that is primarily designed and equipped for technical rescue incidents such as auto accidents, rope rescues, swift water rescues and collapses. It also carries a minimum inventory of equipment to respond to and deal with hazardous materials incidents such as equipment and supplies for decontamination, absorption of chemicals, plugging leaks and protective suits.

The role of the heavy rescue company during technical rescue incidents is to function as the primary rescuers. During fire suppression efforts its role is to initiate

## **FIRE AND EMERGENCY MEDICAL SERVICES OVERVIEW**

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ladder company duties in its first due area or augment the ladder company in performing its duties. In addition, the company has the capability of providing scene lighting and refilling breathing air cylinders.

### Water Tankers

The department deploys two 1,500-gallon water tank apparatus, which are utilized in Colerain's non-hydranted response areas. The role of the water tanker is to deliver large quantities of portable water. These resources may be deployed on building fires. Colerain's two water tankers are assigned at Fire Station 26 (Groesbeck) and Fire Station 109 (Pleasant Run), and are staffed by the engine company crews at those locations based on call type. Water tankers have a limited, but very important application and receive less use than front-line engines.

### Ambulances (Squads)

The department currently deploys four transport ambulances staffed with a minimum of two Emergency Medical Technicians - Basic. All of Colerain's transport units carry a full complement of advanced life support equipment, and are licensed and designated by the state of Ohio as ALS ambulances.

### ALS Units

The department currently deploys two ALS non-transport units staffed with at a minimum of two Emergency Medical Technicians - Paramedics. These units are defined as a vehicle that is routinely dispatched on EMS incidents to primarily provide advanced life support treatment, but is not equipped to transport the patient to a medical care facility.

### **Staffing**

A three-shift platoon system is used to provide 24-hour staffing. Each shift is on-duty for a 24-hour period and off-duty 48-hours. A battalion chief is in charge of each shift and is responsible for the five fire stations. Each fire station has one captain with four to eleven personnel under his or her command each shift. The daily staffing consists of 33 *cross-trained* firefighters and emergency medical technicians per shift, many of whom are paramedics. Staffing distribution is shown in Table 1 as the number of personnel assigned to each company or unit per shift.

## **FIRE AND EMERGENCY MEDICAL SERVICES OVERVIEW**

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*Table 1: Emergency response staffing.*

<b>Station 25 - Northbrook - 3251 Springdale Road</b>	<b>Staffing</b>
Engine 25	4
Ladder 25	5
Squad 25*	
Squad 225*	
Advanced Life Support (ALS 25)	2
District 25 (Battalion Chief)	1
<b>Station 26 - Groesbeck - 3360 W. Galbraith Road</b>	<b>Staffing</b>
Engine 26	4
Rescue 26	1
Water Tanker 26*	
Squad 26	2
Squad 226*	
ALS 26	2
<b>Station 102 - Dunlap - 11474 Colerain Avenue</b>	<b>Staffing</b>
Engine 102	4
<b>Station 103 - Peach Grove - 6000 Thompson Road</b>	<b>Staffing</b>
Engine 103	4
<b>Station 109 - Pleasant Run - 2850 W. Kemper Road</b>	<b>Staffing</b>
Engine 109	4
Water Tanker 109*	
<b>Total Staffing:</b>	<b>33</b>

\* - Staffing complement is derived from fire companies.

Historically, Colerain Fire & EMS has demonstrated leadership and been an innovator in its services delivery to the community and region. For its forward-thinking administration and personnel combined with its commitment to quality emergency services delivery, the department has been recognized as a model for suburban fire departments regionally and nationally. The range of accomplishments and achievements by the department has been many, but it is with considerable satisfaction and pride that just the following few are highlighted.

In July 1976, the department received an ISO rating of Class 4, the first township fire department in Ohio to receive such an outstanding recognition. Over the years the department improved services (e.g., water distribution system, dispatch communications, staffing and training). In 1985, the department's ISO rating improved to a Class 3. When we were re-evaluated in 1998 our rating improved to an ISO Class 2 fire department.

## **FIRE AND EMERGENCY MEDICAL SERVICES OVERVIEW**

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Beginning in 1984, Colerain's fire department was the first suburban Hamilton County department to provide 24-hour staffed fire stations utilizing the more affordable combination-system of staffing using career and part-time paid personnel. This form of staffing significantly improved the delivery of emergency services to the community by providing prompt, skillful, and cost-effective fire protection and emergency medical services. Today, this form of staffing is widely utilized by the majority of suburban fire departments in the region.

In 1988, the department's leadership recognized that safe and effective fire ground operations required the presence of a strong and knowledgeable emergency scene incident commander. Colerain Fire & EMS was the first fire department in the region to implement a structured system of managing emergency incidents by using the *Fire Ground Command System*.

During early 1990, in an effort to further enhance fire ground safety, the department incorporated the regions first personnel accountability system. The accountability system was developed to improve the tracking of firefighters operating at emergency incident scenes and their locations. The department was further instrumental in the establishment of a county-wide accountability system in 1994.

In 1997, the department was the recipient of the International Association of Fire Chiefs *Fire Service Award for Excellence* for its One Stop Public Education Store in which the department operated an interactive, one stop public education store in a major shopping mall store front. Then in 2000, the department was honored again by the International Association of Fire Chiefs with the *Fire Service Award of Excellence for the Decade* for its innovation, professionalism and contributions to the community and fire service from 1990-1999.

For a second time in 2000, the department was presented with another honor for its performance as an emergency medical services provider. The department was bestowed with the Ohio EMS *Star of Life Award* from the American College of Emergency Physicians-Ohio Chapter. During an emergency medical incident in January 1999, department personnel that included Capt. Broxterman responded to and provided aid to an elderly man having a significant cardiac event, but as they were preparing to transport him to the hospital, they also ended up saving his wife who also suffered a significant cardiac event.

The department's Training Division has proven itself as an innovative and respected leader in developing future and incumbent firefighters across the region. Most importantly all of our personnel attend and participate in rigorous education and training activities, maintaining the highest standards of qualification and certification by providing interdepartmental instruction through in-house recruit training, emergency

## **FIRE AND EMERGENCY MEDICAL SERVICES OVERVIEW**

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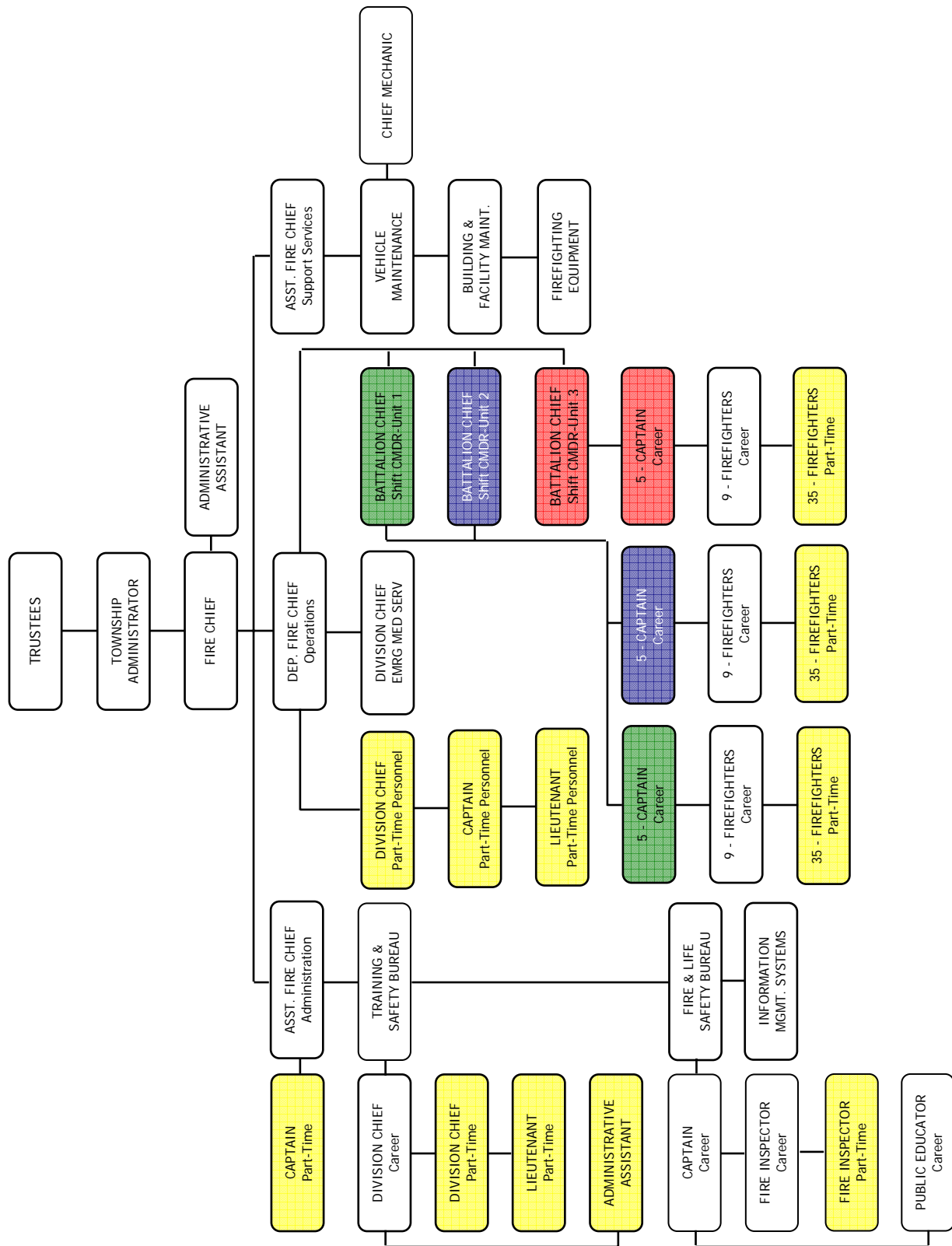
medical technician training and continuing education, and driver and apparatus operations training just to note a few. In addition, personnel attend training programs at or sponsored by educational institutions such as the National Fire Academy, state of Ohio Fire Academy, and area colleges and universities as well as many other national, state and local fire and emergency services training and education venues.

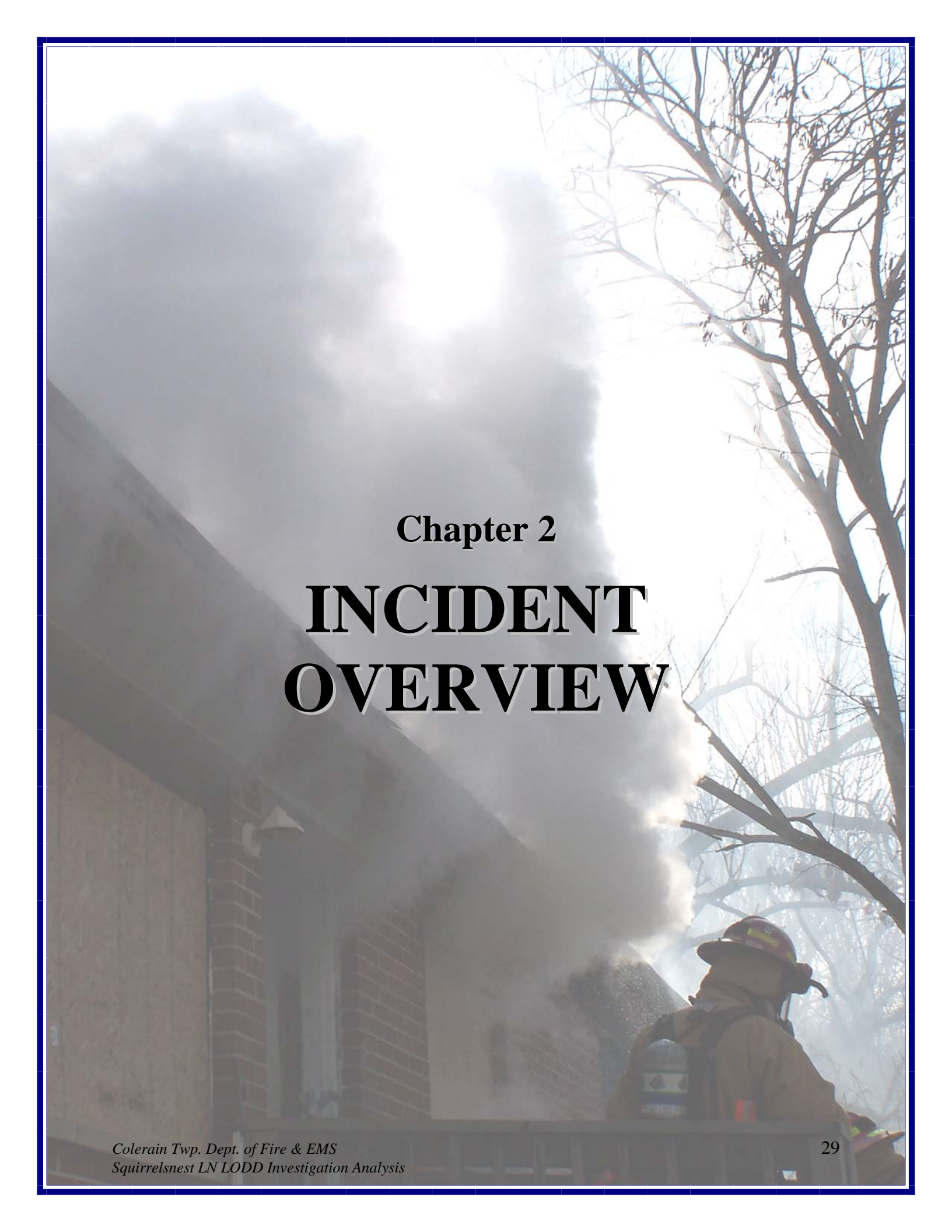
Another first in the region was the department's incident command simulation training system. The simulation system uses digital photos and computer generated graphics that projects smoke and flames on color computer monitors. The system also includes a communications system in which users transmit radio information as they would at an actual incident scene. Instructors can expand and reduce various incidents on the monitors depending on the application of tactics by the incident commander. Personnel that have incident command responsibilities attend regularly scheduled classroom and simulation sessions.

Colerain Fire & EMS has always been a progressive fire department and a leader in its field. The administration and personnel are very proud of these accomplishments and look forward to a future of continual improvement for the department.

# FIRE AND EMERGENCY MEDICAL SERVICES OVERVIEW

Figure 2: Colerain Fire & EMS Organizational Structure.





## Chapter 2

# INCIDENT OVERVIEW



## INCIDENT OVERVIEW

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### Incident Reported

On Friday, April 4, 2008, at 06:11:23, the Hamilton County Communications Center (HCCC) received notification of an automatic alarm activation (smoke detector and carbon monoxide) at 5708 Squirrelsnest Lane (LN). An automatic fire alarm response complement of two engine companies (Engines 102 & 109), one ladder company (Ladder 25), and the Battalion Chief (District 25) were dispatched to investigate at 06:13:02. At 06:13:43, a second notification was received from the female homeowner reporting a fire in the basement of the building. At 06:20:43, a third notification by means of a cellular phone from the female homeowner to HCCC routed through the City of Cincinnati's Fire and Police Communications Center was received. At 06:22:41, the initial response complement was then upgraded to a building fire, also known as a structure fire response complement to include one additional engine company (Engine 25), one rescue company (Rescue 26), and one basic life support transport unit (Squad 25).

### Weather Conditions

The weather conditions provided light rain, an approximate temperature of 58-degrees Fahrenheit, and a measured, sustained wind speed of approximately nine-miles per hour (mph) from the south southwest with wind gusts up to approximately 17-mph.

### Property and Building Description

The building at 5708 Squirrelsnest LN was a single-family residence that set back approximately 450-feet from the street at the end of a private driveway on a heavily wooded lot.

*Figure 3: Aerial view of 5708 Squirrelsnest LN.*



## INCIDENT OVERVIEW

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The building was two-stories in height, approximately 45-feet wide by 30-feet deep with a finished below-grade (basement) living space and attached two-car garage. For simplicity, this document will refer to the living space under the main-level of the building as a basement. From the front (side Alpha), the building was two-stories above grade. The vertical distance between floors was approximately eight-feet. The exterior main entrance was located in the front middle of the building approximately one-foot above grade level. Additional entrances to the first-floor living space were by means of a rear entry door from an upper-level deck area and through the garage area. The interior stairway to the basement was located approximately 15-feet from the front main entry door towards the rear of the building. There were no exposed buildings on the adjacent sides of the fire building.

The building was located approximately 450-feet from the curb and a driveway leading to the front entrance. The nearest fire hydrant was located approximately 500-feet from the front entrance.

To provide for uniform identification of locations and operational forces at the incident scene, the scene was divided geographically into smaller parts, which were designated as *sectors*. Specific areas of the incident scene were designated as follows:

- The side of the building that bears the postal address of the location was designated as Side *Alpha* or front by the Incident Commander (Figure 4);

*Figure 4: Side ALPHA of 5708 Squirrelsnest LN .*



- Continuing in a clockwise rotation, the side adjacent to the Side Alpha side was designated as Side *Beta* (Figure 5);

## INCIDENT OVERVIEW

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*Figure 5: Sides BETA and CHARLIE of 5708 Squirrelsnest LN.*



- Continuing in a clockwise rotation, the side adjacent to the Side Beta side was designated as Side Charlie or the rear (Figure 6); and

*Figure 6: Sides CHARLIE and DELTA of 5708 Squirrelsnest LN.*



- Continuing in a clockwise rotation, the side adjacent to the Side Charlie side shall be designated as Side *Delta* (Figure 7).

## INCIDENT OVERVIEW

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*Figure 7: Side DELTA of 5708 Squirrelsnest LN.*



The property sloped downward towards the rear (side Charlie) of the building with an approximate 13-foot elevation difference from side Alpha to Charlie. The Charlie side of the building was three-stories above the rear grade level with the building's basement floor approximately five-feet above grade level. The exterior entrance to the building's basement area, also known as a *walk-out* was by means of a stairway that led to a wooden deck on the Charlie side adjacent to the Delta side. A second stairway led to an upper level deck that served the main level of the building (Figure 8.).

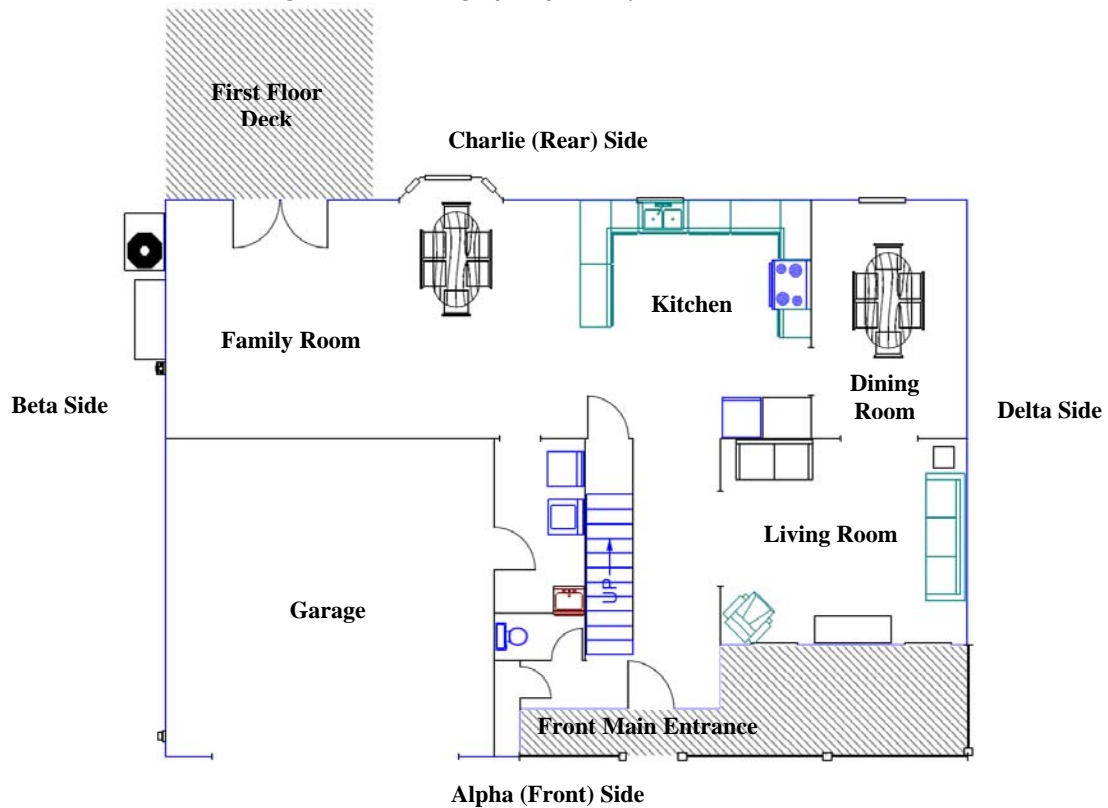
*Figure 8: Side Charlie basement and main-level access.*



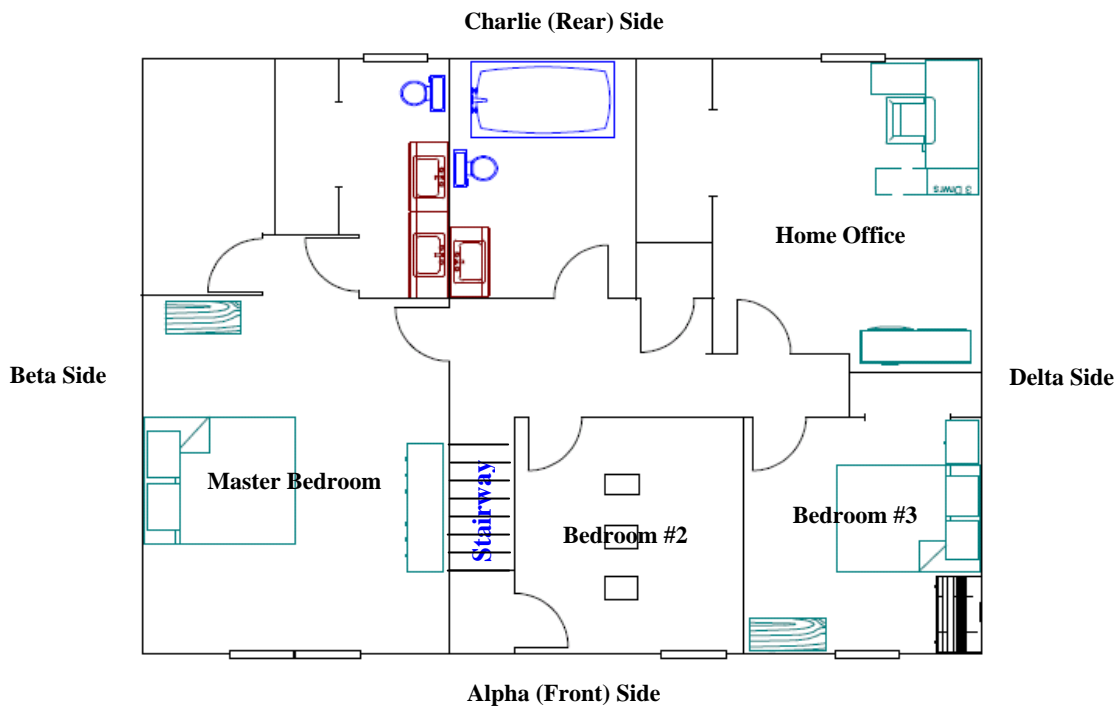
## INCIDENT OVERVIEW

Layouts of the first floor, second floor and basement levels ( Figures 9 through 11).

*Figure 9: Building's first floor layout (not to scale).*

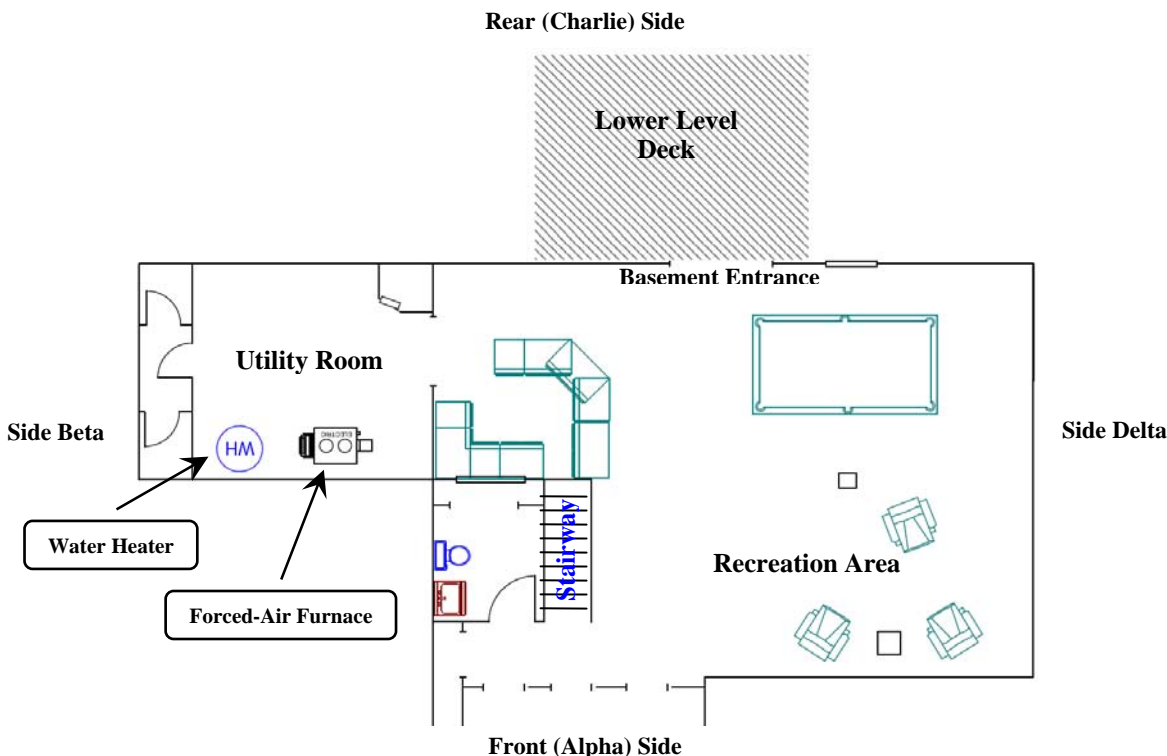


*Figure 10: Second floor layout (not to scale).*



## INCIDENT OVERVIEW

Figure 11: Basement living space layout (not to scale).

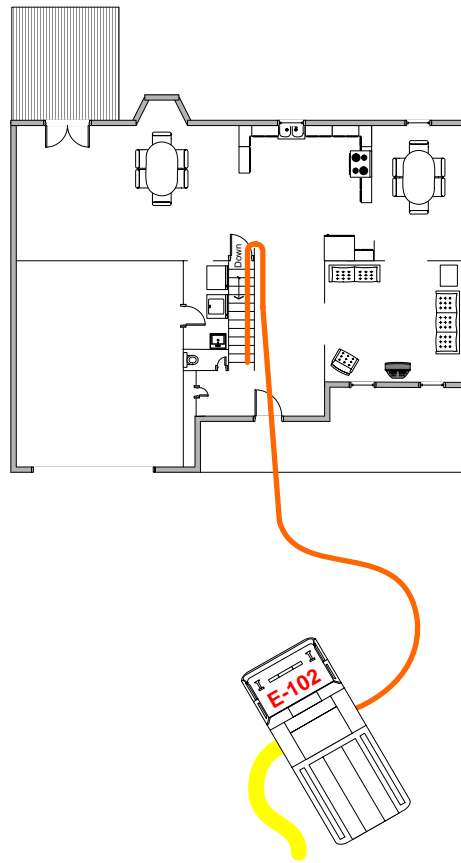


### Initial Fire Attack Operation

Upon arrival at the incident address, Engine 102 (E102), assigned four personnel (one captain, one fire apparatus operator [FAO], and two firefighters) entered and proceeded down the driveway deploying a five-inch supply hose line. With their apparatus positioned in front of the building Captain (Capt.) Broxterman radioed, "Moderate smoke showing. E102 will be Squirrelsnest Command." at 06:24:01. Verification was made by the E102's FAO through *face-to-face* communication with the male homeowner that all occupants were out of the building, which was then relayed to Capt. Broxterman. District 25 (D25) arrived at the scene at 06:26:35 and assumed *Command* from Capt. Broxterman. Capt. Broxterman, Firefighter (Ffr.) Schira and E102's Ffr. #2 advanced a 1¾-inch pre-connected hose line through the front main entrance (Figure 12). The fire was determined to be located in the basement of the building. At 06:27:52, Capt. Broxterman radioed, "E102 making entry into the basement, heavy smoke". At 06:30:35, E109's captain radioed, "Command from E109, contact 102, have them pull out of the first floor, redeploy to the back. It's easy access. Conditions are changing at the front door." At 06:34:48, Engine 25 (E25), the designated Rapid Assistance Team, had just completed their 360-degree size-up around the building, and encountered E102's Ffr. #2 in front of the building, whom reported that he had lost contact with his crew.

## INCIDENT OVERVIEW

*Figure 12: E102's deployed attack hose line and route of travel into the first floor interior of the building (not to scale).*



*Figure 13: Front main entrance doorway.*



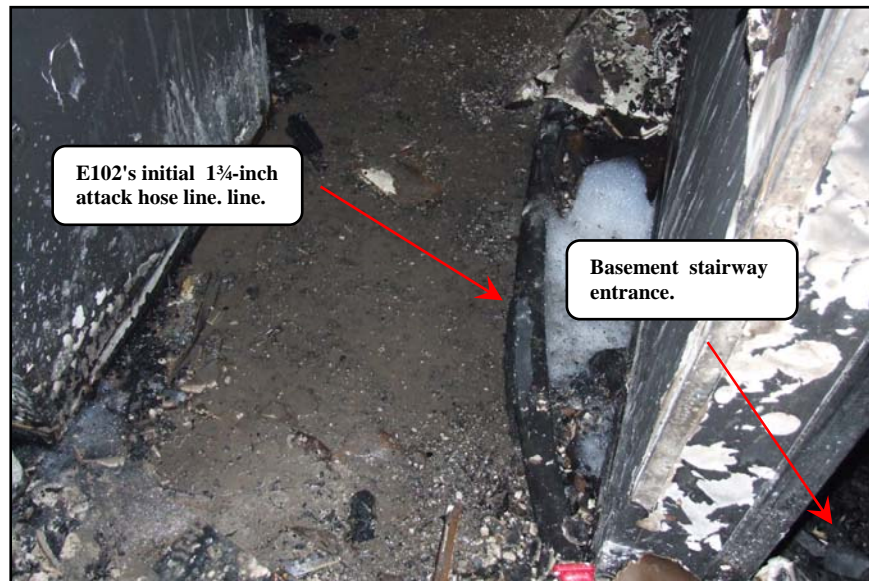
## INCIDENT OVERVIEW

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*Figure 14: View of first floor hallway from kitchen area.*



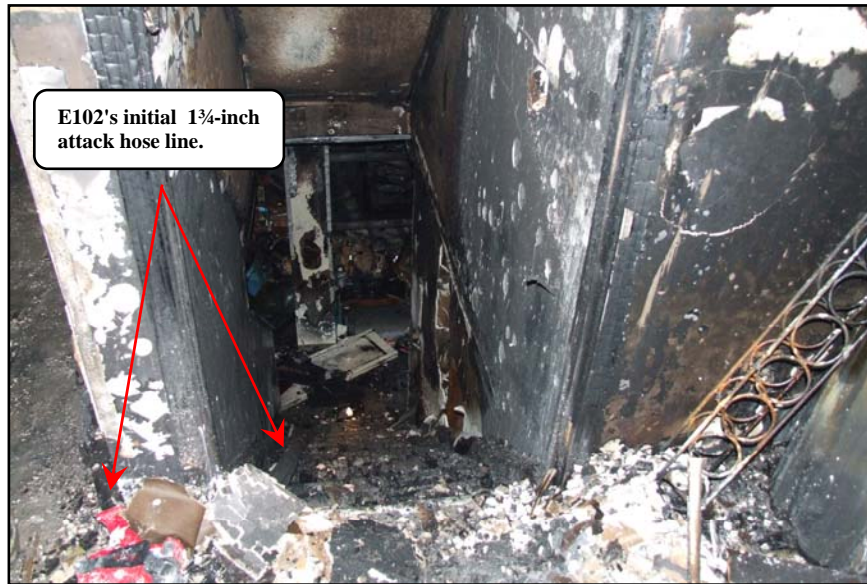
*Figure 15: E102's initial 1 3/4-inch attack hose line deployed in the hallway entering the basement stairway entrance.*



## INCIDENT OVERVIEW

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*Figure 16: First floor stairway to basement.*

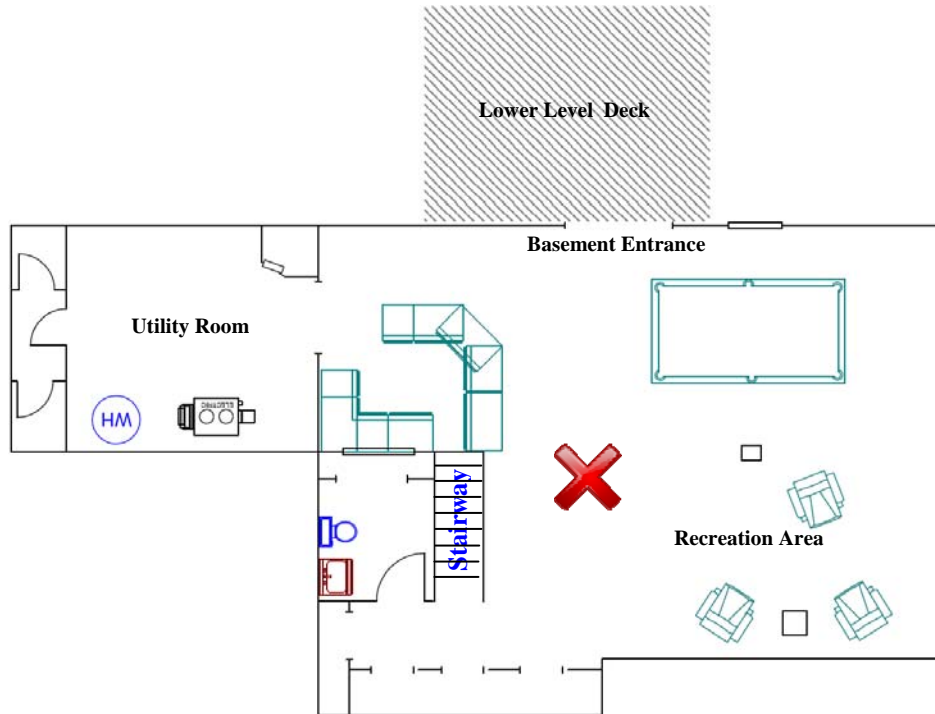


*Figure 17: View of basement stairway from the basement level with hose line deployed over finished top board of stairway wall enclosure.*



## INCIDENT OVERVIEW

*Figure 18: The approximate location of where E102's team forward advancement of attack hose line stopped before evacuating the basement (not to scale).*



*Figures 19: View of the Recreation Room area from the Alpha side looking towards the Charlie side of the building.*



## INCIDENT OVERVIEW

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*Figures 20: View of the Recreation Room area from the Alpha - Delta corner looking towards the Beta - Charlie corner.*



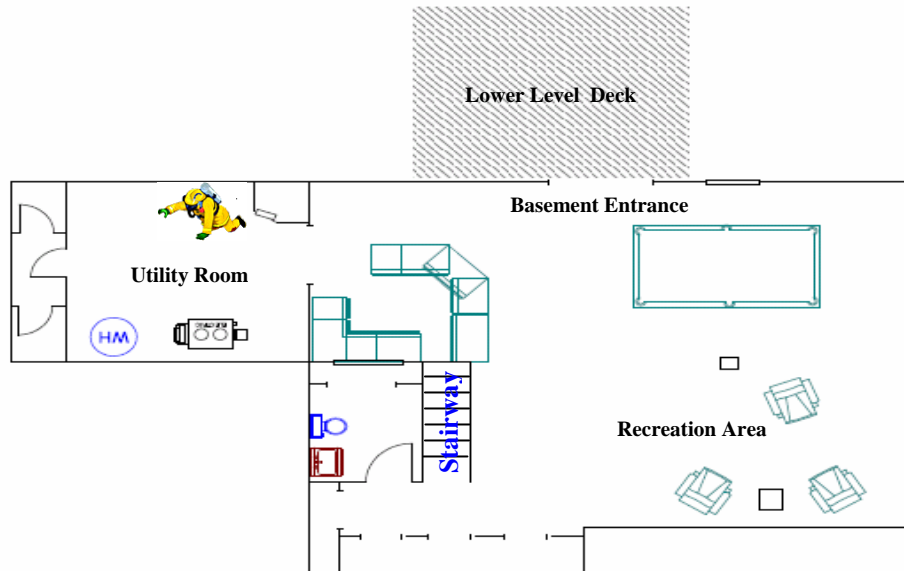
During the time period between 06:29:24 and 06:34:48, the investigation committee believed that one or more catastrophic events occurred including a failure of the main-level flooring system near the Beta - Charlie corner of the building.

### **Rescue and Recovery Operations**

At 06:35:34, the Incident Commander (IC) identified a potential *Mayday* operation, which indicates a life threatening situation to a firefighter. RAT25 was deployed at 06:36:48. The actual Mayday operation was initiated by the IC at 06:37:41 followed by a request at 06:37:53 to the HCCC for a second alarm complement of firefighting resources. At 06:42:01, RAT25 entered the basement from the rear of the building. At 07:00:27, E26's personnel entered through the front main entrance of the building and into the basement by means of the interior stairway. Both missing firefighters were located in the basement near the Charlie side wall adjacent to the Beta side following a floor collapse (Figures 21 & 22). Capt. Broxterman and Ffr. Schira were obviously deceased as a result of their injuries.

## INCIDENT OVERVIEW

*Figures 21 & 22: Approximate location where both deceased firefighters were found (not to scale).*



### Fire Origin and Cause

Investigators from the state of Ohio Fire Marshal's Office, Hamilton County Sheriff's Department, Hamilton County Arson Task Force, and Colerain Township Police Department worked collectively to determine the fire origin and cause.

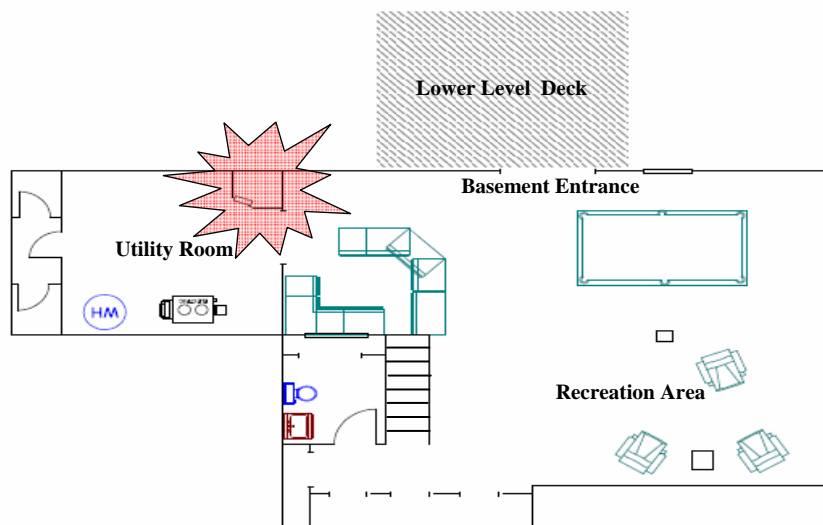
Information from the property owners was that the female had smelled an odor in the house. She told her husband, who went to investigate. Neither of them observed any smoke or flames at that time. The husband went to the basement, and located a fire near

## INCIDENT OVERVIEW

a cedar wood lined closet used to cultivate orchids in the unfinished utility room. He attempted to extinguish the fire with portable fire extinguishers and pans of water. As the fire alarm activated, the husband had his wife call 9-1-1 to report the fire.

The state of Ohio Fire Marshal's Office Fire and Explosion Investigation Bureau ruled the fire to be *accidental* in nature. The fire was determined to have originated in the unfinished utility room of the basement level in or near the cedar closet (Figure 23). This area was directly below the family room on the first floor. The probable ignition source for this fire was determined to be at and about a plastic air circulation fan and the associated electrical wiring.

*Figure 23: Area of fire origin in the basement (not to scale).*



### Cause of Deaths

#### Capt. Broxterman

Capt. Broxterman was a 37-year old employee of the Colerain Fire & EMS with approximately 17-years of certified firefighting experience. Capt. Broxterman became trapped in the basement area for a prolonged amount of time following the sudden floor collapse. Capt. Broxterman was found positioned face down over top of Ffr. Schira. The majority of her protective clothing ensemble and equipment were heavily damaged as a result of exposure to heat and direct flame impingement. She was pronounced deceased following her removal from the building. Her body was transported to the Hamilton County Coroner's Office for autopsy.

The Coroner's report cited the manner of death as "accidental" and the cause of death as "burns and inhalation of smoke and superheated and noxious gases." Capt. Broxterman sustained burns to 100% of her body surface, which ranged from first to

## INCIDENT OVERVIEW

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fourth degree in severity as described in the coroner's autopsy report. Postmortem carboxyhemoglobin (COHb), which is a measure of carbon monoxide exposure, was measured at 22% saturation and soot was observed in portions of her upper and lower respiratory system.

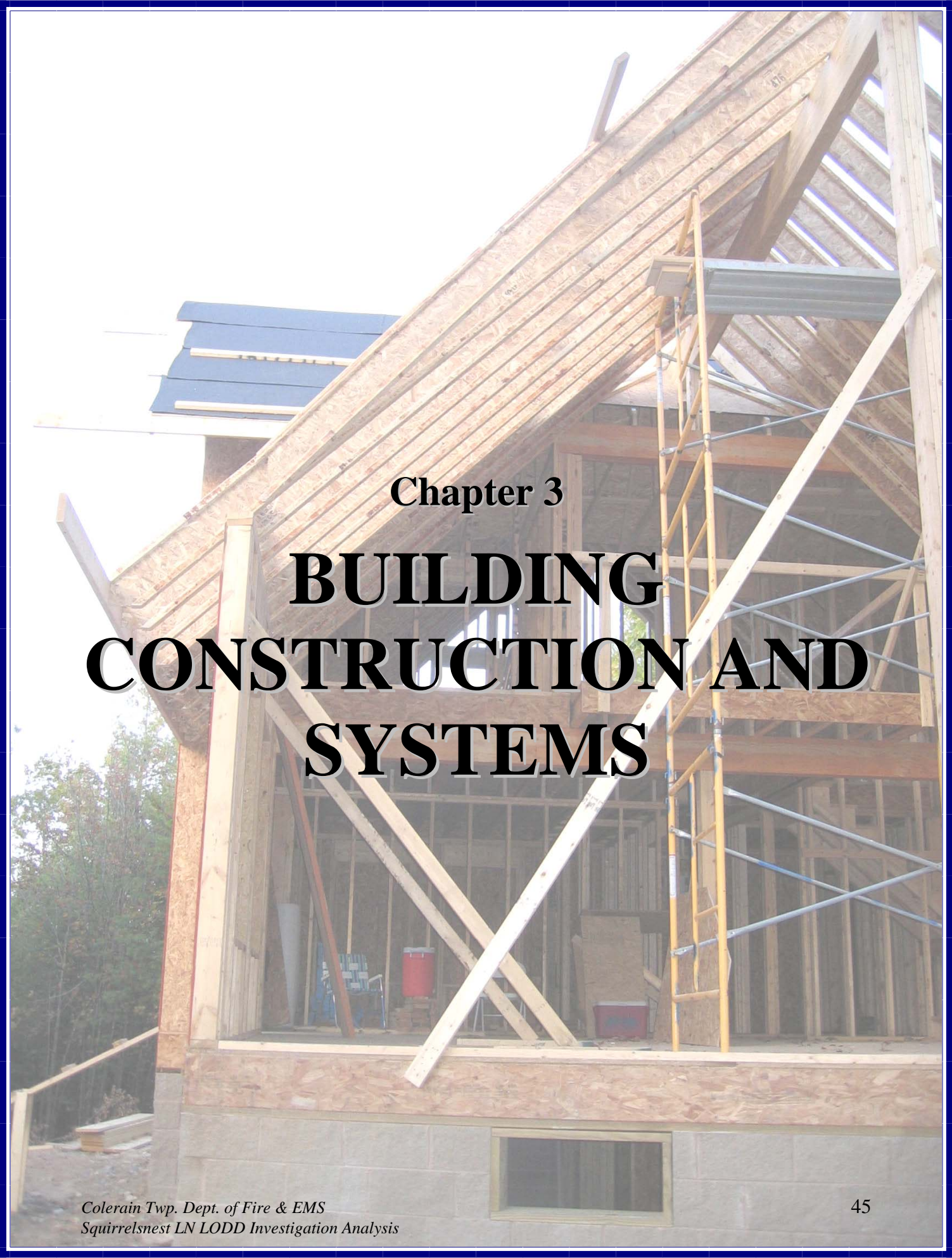
Based on the injuries sustained and the damage to Capt. Broxterman's protective clothing ensemble and equipment, it is likely that she was exposed to a rapid intensification of heat and flames in the building's basement that overwhelmed her protective ensemble and equipment, exposing her body and respiratory system to intense heat and toxic products of combustion.

### Ffr. Schira

Ffr. Schira was a 29-year old employee of Colerain Fire & EMS with approximately 3½-years of certified firefighting experience. He also became trapped in the basement area for a prolonged amount of time following the sudden floor collapse. Ffr. Schira was found positioned on his right side and back, face-up beneath Capt. Broxterman. The majority of his protective clothing ensemble and equipment was heavily damaged as a result of exposure to heat and direct flame impingement. Ffr. Schira was pronounced deceased following his removal from the building. His body was transported to the Hamilton County Coroner's Office for autopsy.

The Coroner's report cited the manner of death as "accidental" and the cause of death as "burns and inhalation of smoke and superheated and noxious gases". Ffr. Schira sustained burns to 100% of his body surface, which ranged from first to fourth degree in severity as described in the coroner's autopsy report. Postmortem COHb was measured at 8% saturation and soot was observed in portions of his upper and lower respiratory system.

Based on the injuries sustained and the damage to Ffr. Schira's protective equipment, it is likely that that he was exposed to a rapid intensification of heat and flames in the building's basement that overwhelmed his protective ensemble and equipment, exposing his body and respiratory system to intense heat and toxic products of combustion.



# Chapter 3

# **BUILDING CONSTRUCTION AND SYSTEMS**



## BUILDING CONSTRUCTION AND SYSTEMS

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### Overview

Wood frame construction is the predominant method of constructing homes and apartments in the United States. According to Vincent Dunn, retired Deputy Fire Chief of the Fire Department of New York, "Of the five types of building construction (fire-resistive, non-combustible, ordinary, heavy timber and wood frame), wood frame construction presents the greatest firefighting danger" (Dunn, n.d., ¶ 1).

The building at 5708 Squirrelsnest LN was an approximate 2,046-square-foot (main two floors), two-story, single-family home located in the Squirrelsnest Subdivision in the Dunlap area of the township. The building construction was similar to Type V construction as described in the NFPA 220: Standard on Types of Building Construction. Type V construction is described as exterior walls, bearing walls, trusses, floors, and roofs that are entirely or partially of wood or other approved combustible material. The building was constructed in 1991, utilizing wood frame platform construction methodology using traditional (sawn) lumber products on a poured concrete foundation with a brick veneer exterior. The roof construction utilized prefabricated wood trusses. The gable roof was covered with composition shingles.

Platform frame construction is the principal method of building homes and apartments in Colerain Township. In platform-frame construction, first-floor joists are completely covered with sub-flooring to form a platform upon which exterior walls and interior partitions are erected. Platform construction is easy to erect. It provides a work surface at each floor level and is readily adapted to various methods of prefabrication. In platform systems it is common practice to assemble wall framing on the floor and tilt the entire unit into place. From a fire-protection perspective, platform frame construction inhibits fire spread from one floor to another by eliminating continuous stud cavities, which is vastly different than balloon frame construction. In balloon-frame construction, exterior wall studs continue through the first and second stories. A fire can eventually burn through the wood platform, but the platform will slow the fire spread.

The finished interior walls of the Squirrelsnest LN building were covered with gypsum drywall throughout with the exception of an *unfinished* utility room in the basement. The finished ceilings on the main and second-levels were also covered with gypsum drywall while the basement ceiling was of the suspended type comprised of two-feet by four-feet acoustical tiles. The main level (first-floor) and second-level flooring systems were comprised of two-inches by 10-inches wood joist constructed 16-inches on center with ¾-inch oriented strand board as the sub-floor. The main-level floor coverings consisted primarily of carpet and ceramic tile. The building was heated and cooled by means of a forced-air system fueled and powered by natural gas and electricity. The building was equipped with a monitored automatic smoke and carbon monoxide

## BUILDING CONSTRUCTION AND SYSTEMS

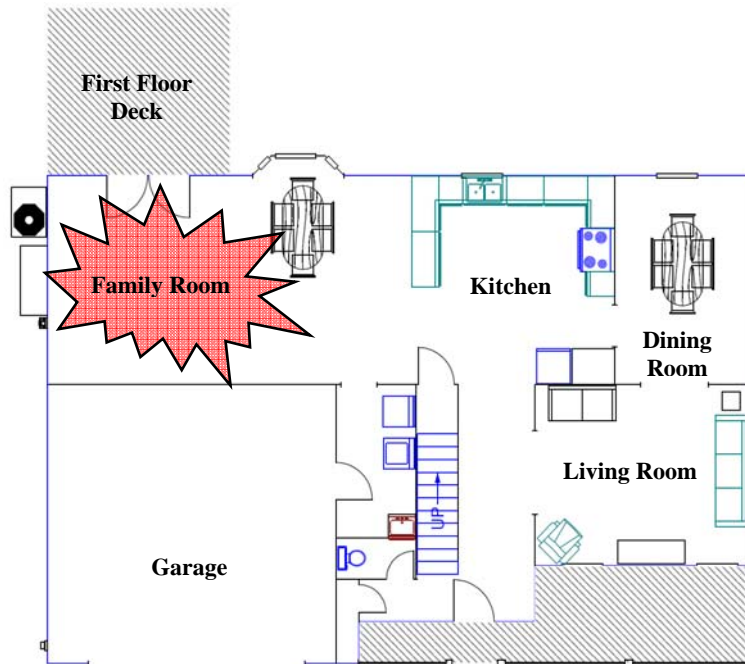
detection system, but contained no automatic fire extinguishment system (e.g., residential sprinkler system).

### Findings, Discussions and Recommendations

***FINDING #3.1:*** The area of fire origin had no finished ceiling, which exposed the floor joists and the underside of the floor decking to direct fire impingement causing rapid deterioration and failure of the flooring system directly underneath the main-level family room.

During this incident, based on communications transcripts (telephone and radio) it's probable that the fire had advanced from its incipient stage to a free burning stage in approximately 18 to 20-minutes by the time Capt. Broxterman radioed that they were making entry into the basement. As stated in the Incident Overview section, during the time period between 06:29:24 and 06:34:48, it is believed that one or more catastrophic events occurred within the building, which included a failure of the flooring system near the Beta-Charlie corner of the building's first floor (Figure 24).

*Figure 24: Approximate area of flooring system collapse (not to scale).*



It has been widely believed in the firefighting profession that traditional sawn lumber is far superior to some of the more innovative lightweight construction components (e.g., wood I-joist) in use today. With dimensional lumber, two-inch by eight-inch and larger, there is a greater surface to mass ratio to resist the damaging effects of fire and the structural components will maintain their integrity for a longer period of time. While this has traditionally been accurate, this incident clearly shows that this may

not always be the case. Figure 25 shows the heavy charring to structural members in the fire area of origin. Notice the burn damage shows how the wooden floor joists had been burned to and away from the band joist. A band joist is a vertical member that forms the perimeter of a floor system in which the floor joists tie in to. Also known as the rim joist.

*Figure 25: Extensive burn damage to floor joists.*



Early platform framed homes very likely used solid, dimensional lumber and plywood, which provided a reasonable surface to mass ratio. But the later the home was built, the less mass even dimensional lumber has due to the reduction in the actual thickness of solid dimensional lumber provided by the lumber industry through the mid-1900's. As the years go by, building materials will likely keep getting lighter and lighter and introduce more resins and other chemicals.

Laboratory tests that exposed structural wood components to the American Society for Testing and Materials (ASTM) E119 Assembly Test indicated that a traditional two-inch by ten-inch structural member failed in 12-minutes and six-seconds. ASTM E119 test is the standard test method for evaluating building and construction materials exposed to fire.

Unlike the standardized ASTM test fires, it is widely recognized that real building fires are highly variable in their size, rate of growth and intensity. Responding firefighters are unlikely to know when a given fire started, how hot it had been prior to arrival, how long it had been at any given temperature, the design capacity and actual loads on the floors over the fire or the amount of actual damage that the fire may have done to the joists. All of these factors make it impossible to predict the remaining capacity of a floor by even the most knowledgeable, professional fire experts.

## BUILDING CONSTRUCTION AND SYSTEMS

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**RECOMMENDATION #3.1a:** Fire departments should ensure that firefighters and incident commanders are aware that unprotected floor and ceiling joist systems, no matter the type, may fail at a faster rate when exposed to direct fire impingement.

Unfinished basement ceilings and other areas that have exposed joists or trusses jeopardize flooring and roof systems unnecessarily during a fire, causing premature failure. Often, a weakened floor and ceiling joist system can be difficult to detect from above as the floor surface above may still appear intact. Firefighters operating on floors above fire-damaged joist systems may fall through a weakened area and become trapped in a fire below. IC's and firefighters must be aware that these systems can fail rapidly and without warning, and plan interior operations accordingly.

Firefighters must also be aware that while floor sag may be a widely accepted warning of an impending structural failure, floor sag is not always present or visible prior to a catastrophic collapse in a fire, regardless of the joist type, due to floor coverings, the fire's intensity, the combination of joist spans and loads present, the location of serious structural fire damage or simply because it is too dark and smoky to see a sag in the floor. This is true for all types of structural joists, including materials such as sawn lumber, wood I-joists, and open web wood trusses and noncombustible members such as lightweight steel joists. Figure 26 shows the Squirrelsnest building collapsed area. The floor covering in this area was carpeting that transitioned to ceramic tile.

*Figure 26: First-floor view of the collapsed area.*



When unprotected, any traditional or lightweight residential floor or ceiling assembly material, either combustible or noncombustible, may fail within several minutes of the fire's ignition. It makes sense, therefore, that when there is a serious fire beneath a floor, there is *no predictable safe amount of time* that anyone can remain on that floor.

## BUILDING CONSTRUCTION AND SYSTEMS

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Any floor system protected or not, can fail unpredictably when exposed to a substantial fire beneath.

**RECOMMENDATION #3.1b:** Fire departments should give consideration to the development of early identification systems that provide pre-incident information (e.g., dispatch provided, signage affixed to the building) regarding building construction materials and features.

Today, more engineered buildings use lighter weight materials that produce larger spans and clear openings. Beams and trusses can be designed to carry expected loads, be produced economically, be safely handled, and reduce construction costs.

Knowing that a building is platform framed introduces the fact that the later the building was constructed, the more likely the building incorporates engineered lightweight lumber or light gauge steel. Yet while keeping in mind that additions and interior renovations to the existing buildings will undoubtedly introduce more modern-day materials and methods into the building. Surveys of neighborhoods and pre-incident action planning may be helpful in determining where lightweight construction exists.

**RECOMMENDATION #3.1c:** Fire departments should support building codes that promote residential automatic fire sprinkler systems, both in multi-family buildings as well as single-family residential buildings.

Many lives of civilians and firefighters continue to be unnecessarily lost in residential buildings due to fire. Many of these lives may have been saved had their homes been protected with automatic fire sprinklers. While smoke detectors have had a significant impact on reducing the number of fatalities over the past several years, the NFPA reports that a combination of fire sprinklers and smoke detectors can reduce the risk of dying in a residential fire by about 80%. The presence of automatic fire sprinklers would also serve to reduce risks faced by firefighters when fighting fires in buildings constructed from lightweight engineered wood framing systems.

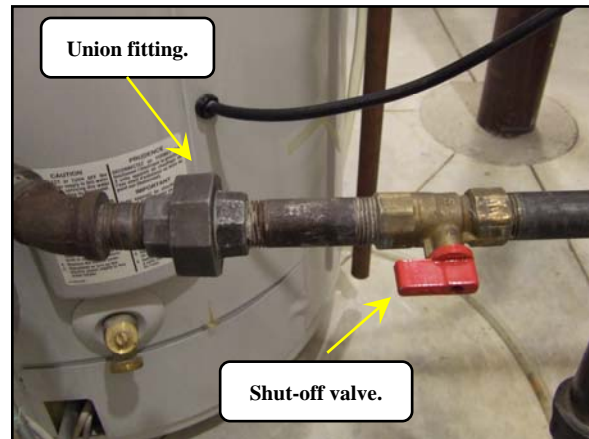
**FINDING #3.2:** A combination of heat exposure and collapse of the floor system likely contributed to a failure of the natural gas supply piping components that fueled the furnace resulting in a free flowing supply of natural gas into the utility room area.

At the time of this incident, in respect to the natural gas fuel supply, black iron pipe (BIP) was used to connect the furnace and water heater to the fuel supply. BIP was joined using threaded connections, where tapered threads are cut into the pipe section end. Sealant is applied to the exposed threaded male pipe ends and then threaded into the corresponding female threaded fitting using a pipe wrench.

## BUILDING CONSTRUCTION AND SYSTEMS

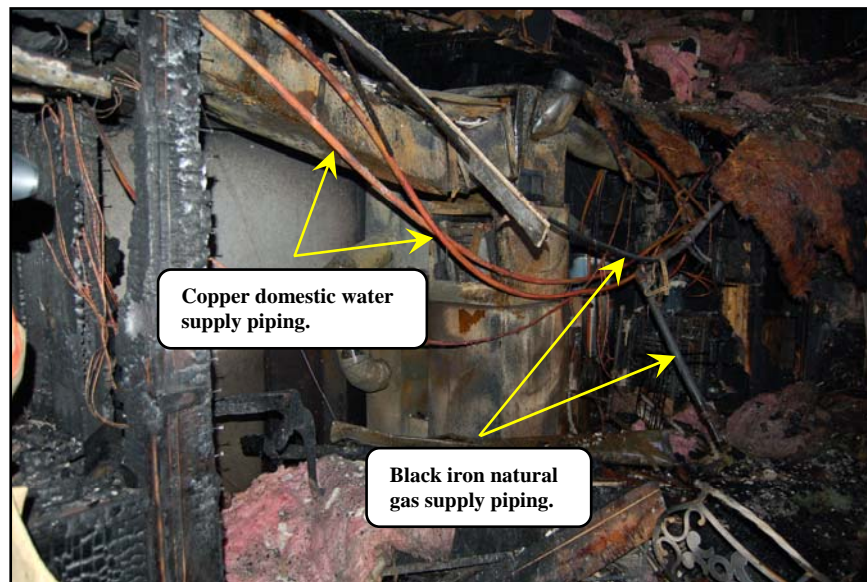
To control the flow of fuel, an equipment shut-off valve as a rule is located in the piping system that is used to isolate individual equipment for purposes such as service or replacement. A union fitting is also installed between the shut-off valve and the appliance as shown in Figure 27.

*Figure 27: Typical residential gas fueled equipment shut-off installation arrangement.*



During the committee's investigation of this incident, it believed that the shut-off valve failed as a result of a combination of the collapsing floor system, BIP deformation and thermal (relating to or caused by heat) exposure (Figure 28). The shut-off valve likely either melted or fell away from the BIP while exposed to the ignited free-flowing natural gas. The free flowing natural gas in the utility room intensified the fire in this area. Characteristically, natural gas burns at approximately 3,000 degrees Fahrenheit (F). This is plus or minus 100 degrees F.

*Figure 28: Extensive deformation of black iron natural gas supply and copper domestic water supply piping.*



The shut-off valve and BIP union or evidence of the fittings were unaccounted for following the origin and cause phase of the investigation. It is likely that the shut-off valve was manufactured of brass. Brass is any alloy of copper and zinc; the proportions of zinc and copper can be varied to create a range of brasses with varying properties. Brass is a substitution alloy. It has a bright gold-like appearance, and is used for

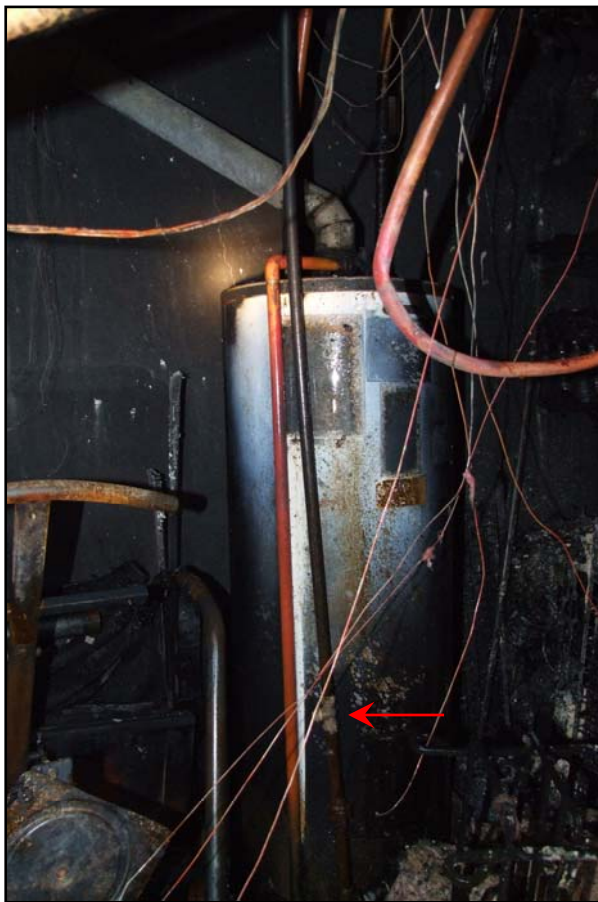
## BUILDING CONSTRUCTION AND SYSTEMS

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applications where low friction is required such as valves for plumbing applications. Brass has higher malleability than copper or zinc. The relatively low melting point of brass (1652° F to 1724° F, depending on composition) and its flow characteristics make it a relatively easy material to cast. By varying the proportions of copper and zinc, the properties of the brass can be changed, allowing hard and soft brasses.

Figure 29 shows the location of the shut-off valve for the water heater, which appears to be brass material. Figure 30 shows the exposed male threads of the location of the joining points of the union fitting and shut-off valve.

*Figure 29: Water heater appliance natural gas supply shut-off valve.*



*Figure 30: Exposed male ends of the building's furnace natural gas supply piping.*



**RECOMMENDATION #3.2:** Fire departments should give utility control (shutting off the electricity, gas and water to prevent injury and or further damage) a high priority during building fire operations.

Firefighters must have a good working knowledge of the utility services within a building. Utility services within a building often contribute to problems during

## BUILDING CONSTRUCTION AND SYSTEMS

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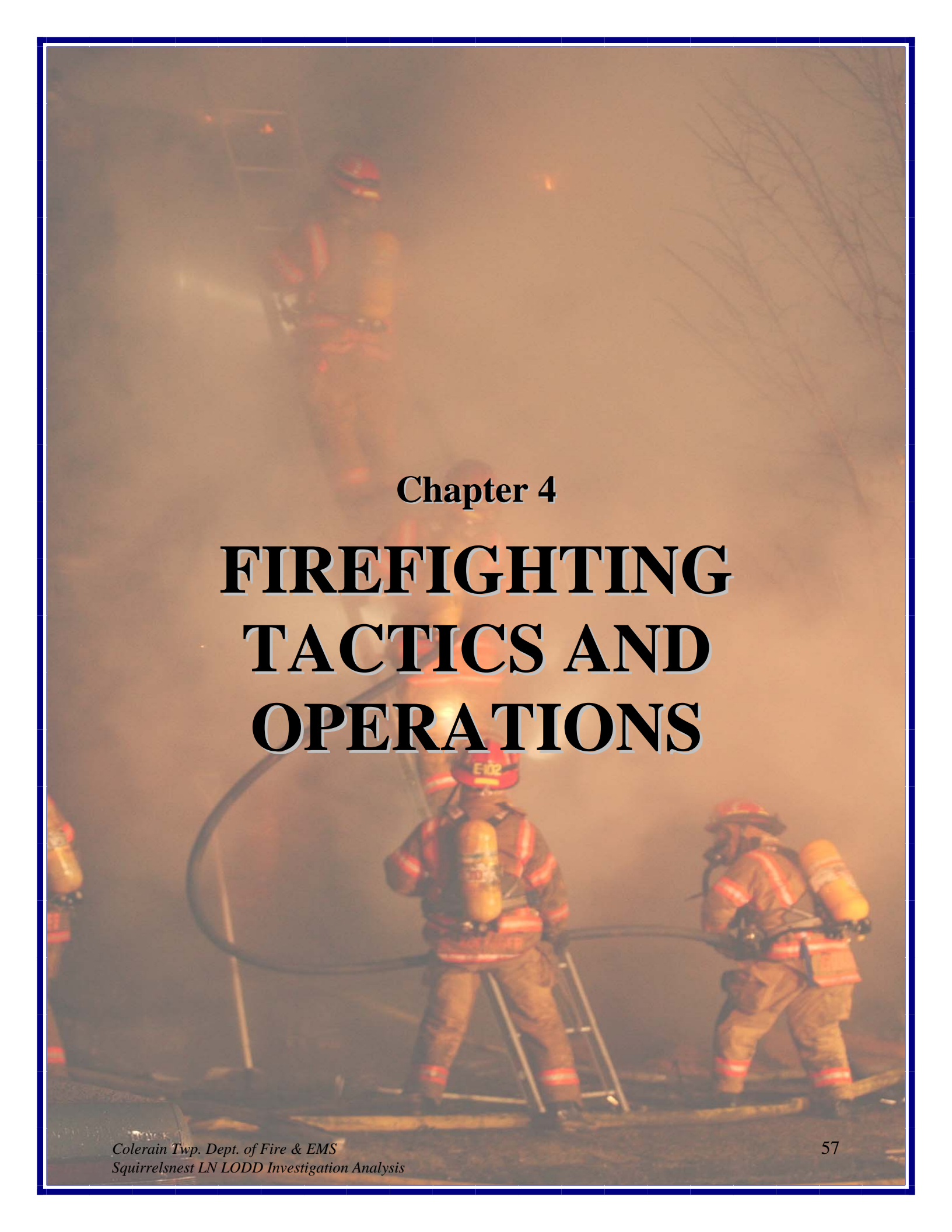
firefighting operations. If these services are not controlled early in the incident, they have the potential to add fuel to the fire, contribute to extension, create additional damage, and cause extremely hazardous conditions. The ability to safely control an occupancy's gas, electricity, and water has pronounced effects on firefighter safety.

Fire incidents that occur in one and two-family residences may be some of the most hazardous for firefighters to combat, as these buildings do not possess the same life safety or construction design features as commercial buildings, nor are they subject to any regular fire or life safety inspections after initial occupancy is granted. It is for this reason that firefighters must anticipate a wide range of dangerous conditions in private residences including unacceptable construction and alterations including structural member modification that may weaken a building leading to premature collapse. Further, firefighters must utilize proven methods to assess building integrity such as sounding floors with appropriate tools, utilizing thermal imaging cameras to locate concentrations of fire that may have weakened structural members, and visually identifying building characteristics learned in building construction training.

### REFERENCES

Dunn, V. (n.d.). *Three story wood frames*. Retrieved February 19, 2008 from <http://www.workingfire.net/engine8.htm>



A photograph of firefighters at night, with one firefighter on a ladder in the background and two others in the foreground. The scene is filled with smoke and fire, creating a dramatic and hazardous environment. The firefighters are wearing full protective gear, including helmets, jackets, and air tanks.

## Chapter 4

# FIREFIGHTING TACTICS AND OPERATIONS



# FIREFIGHTING TACTICS AND OPERATIONS

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## Overview

The fire ground requires firefighters to perform numerous tasks, all working in a systematic and coordinated effort to reach the common goal of successfully and safely mitigating the incident. One of the most basic principles is that the firefighter's responsibility is to protect life and property.

When a fire company arrives at the scene of a building fire incident, a number of items should go through the minds of the company officer and firefighters – particularly size-up. Often the company begins taking action to control the situation almost simultaneously. The actions that they take, regardless of the type of incident that they encounter, will almost always follow the sequence of: protect life, locate, confine, and extinguish the fire. This is accomplished by means of firefighting strategies and tactics. Firefighting strategy is the general plan or course of action decided upon by the IC in order to achieve firefighting objectives. Firefighting tactics are the operations or actions required to carry out the strategy selected by the IC.

According to John Norman's book, *Fire Officer's Handbook of Tactics*, the general principles of firefighting are:

1. When sufficient manpower is not available to affect both rescue and extinguishment at the same time rescue must take precedence;
2. Remove those in greatest danger first;
3. When sufficient manpower is not present to perform all needed tasks, perform those that protect the greatest number of human lives first;
4. When personnel is sufficient to do both, a coordinated fire attack must be carried out; and
5. When there is no threat to occupants, the lives of firefighters must not be unduly endangered. (1991, pp. 4 - 9)

In this section, the sequence of events will be illustrated as they unfolded operationally during this incident.

*The following sequence of events was developed from known times of events based on radio transmission timestamps and firefighter witness statements. Those events with known times are identified. Events without concrete times are approximated in the sequence of events based on firefighter statements regarding their individual actions and observations at the fire.*

On April 4, 2008 at **06:11:23 AM**, the Hamilton County Communications Center (HCCC) 911 operators received a report of an automatic fire alarm activation from the

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American District Telegraph Alarm Company, also known as ADT for the first-floor smoke detector and basement carbon monoxide detector for 5708 Squirrelsnest LN. At **06:13:02**, E102, Engine 109 (E109), Ladder 25 (L25) and D25 were assigned to investigate the alarm activation by the HCCC West dispatcher, and assigned *Fire Ground Channel Two* for fire ground communications.

At **06:13:43**, HCCC received a telephone call from Mrs. Cones, the female homeowner stating, "We have a fire at our house. In the basement." At **06:14:06**, E102 radioed en-route to the scene. The dispatcher acknowledged, "E102 en-route, 5708 Squirrelsnest LN, at **6:14:10**. This is also a long-lay location. Refer to map page 169, 169." [Through pre-incident action planning, an address is considered a long-lay if its driveway or access road is 900-feet or greater from a fire hydrant or any other water source used for fire protection. In addition, an address is also considered a long lay if the driveway is of a relatively short-distance but the building cannot be visually seen from the street.] HCCC received a second telephone call at **06:20:43** from Mrs. Cones by means of cellular telephone reporting a building fire, which was transferred from the City of Cincinnati's Fire and Police Communications Center. At **06:22:02**, the West Dispatcher advised, "Attention E102... the resident called from 5708 Squirrelsnest LN advising there's a working structure fire. They're evacuating. Repeating, reference 5708 Squirrelsnest LN, resident called advising it is a working structure fire. They are evacuating the residence."

At **06:22:34**, E109's officer in charge (OIC) requested a re-dispatch.

At **06:22:41**, the incident was re-dispatched and upgraded to a structure fire response, which added E25, Rescue 26 (R26) and Squad 25 to the complement of units responding.

At **06:22:47**, E109 OIC radioed Capt. Broxterman, "102 did you copy the working fire? Capt. Broxterman responded, "Clear."

At **06:23:50**, E109's OIC transmitted on the fire ground channel, "E109, all companies, E102 has street laid at the driveway." As E102 entered the driveway, they deployed a five-inch large diameter supply line. The driveway entrance was approximately 450-feet to the front of the building.

At **06:24:01**, staffed with four personnel (Capt. Broxterman, a fire apparatus operator [FAO], two firefighters [Firefighter Schira and Fire Firefighter #2]), E102 radioed on scene and provided the following report: "E102 on the scene, moderate smoke showing. E102 will be Squirrelsnest Command."

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At **06:24:55**, E109 staffed with four firefighters (an OIC, FAO, two firefighters) radioed on scene. As E109's OIC and two firefighters moved forward towards the fire building, the FAO remained at the driveway entrance and connected E102's supply line to the fire hydrant located at 5712 Squirrelsnest LN.

At **06:25:35**, L25 staffed with four firefighters (an OIC, Aerial Truck Operator [ATO], two firefighters) radioed on scene.

At **06:26:00**, the HCCC broadcasted the following transmission, "Attention for all units, 5708 Squirrelsnest LN, received an additional call stating that the fire was in the basement of the residence, stating fire is reported to be in the basement of the residence of Squirrelsnest LN."

At **06:26:35**, D25 reports on-scene and assumes command (hereafter, referred to as *Squirrelsnest Command* or *Command*). At **06:26:45**, Command radioed E102 on fire ground channel two, "... , do we have a confirmed working fire?" E102's personnel deployed a 150-foot, 1¾-inch pre-connected hose line with an automatic nozzle to the front main-level entrance door. At **06:26:56**, Capt. Broxterman replied to Command's request, "E102 is advancing into the structure at this time. Stand by." At **06:27:03**, Capt. Broxterman ordered, "... we need water." At **06:27:12**, L25 transmits, "L25... that is .... We do have a working fire."

At **06:27:08**, Command radioed HCCC, "Squirrelsnest Command. ...., dispatch this as a staff notification..." [A staff notification is an additional activation of the dispatch paging system to notify off-duty chief and staff personnel of an event or response by the department.]

At **06:27:41**, Car 2508 (Training Division Chief) radioed on-scene.

At **06:27:52**, Capt. Broxterman radioed, "E102 making entry in the basement, heavy smoke." Command replied, "Interior, I'm getting a lot of feedback from you." L25's OIC then radioed, "L25, be advised E102 is making entry into the basement."

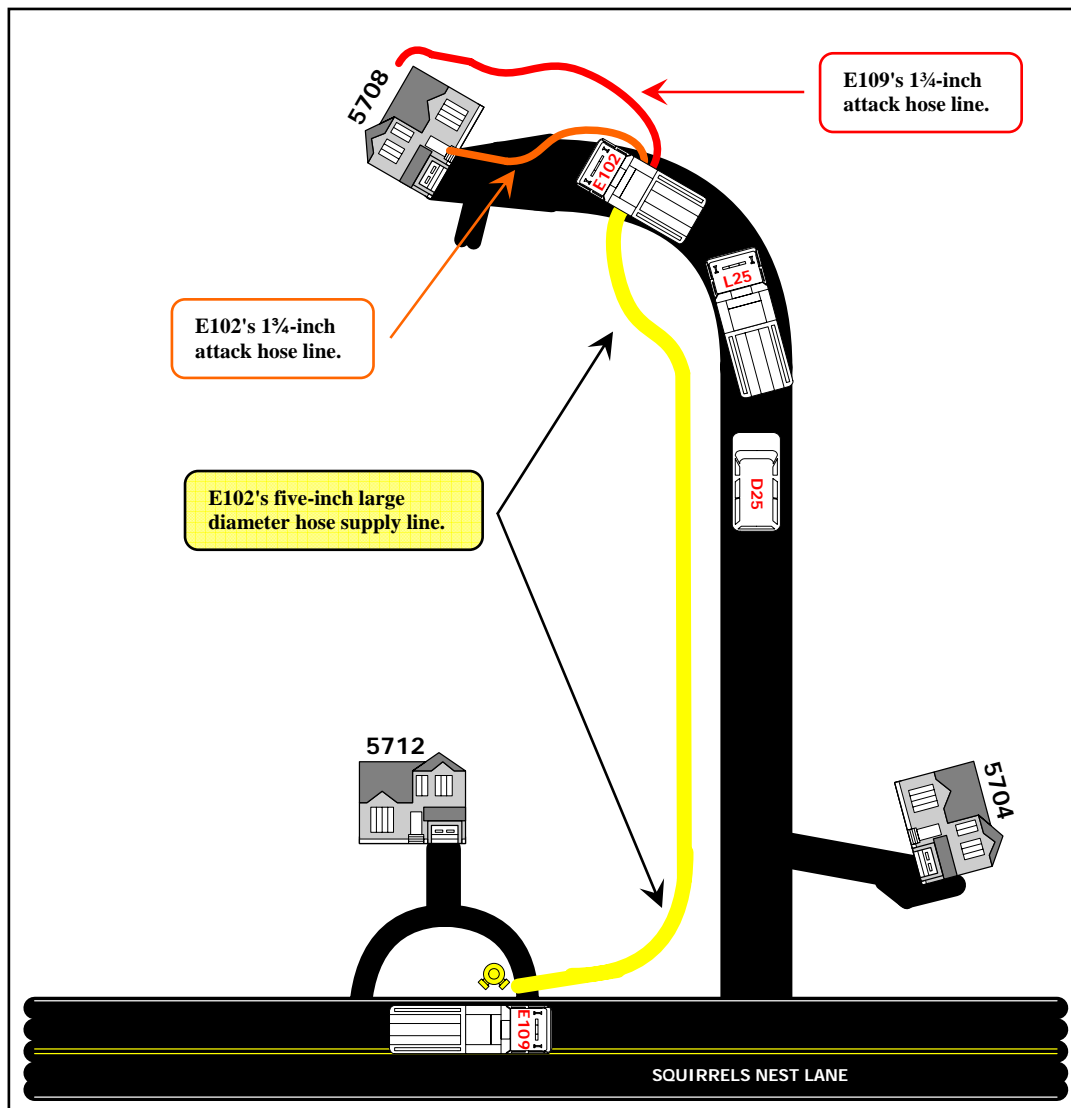
While en-route to the scene, E25 is assigned to handle incident *accountability* upon their arrival. [Accountability is a system that readily identifies both the location and function of all personnel operating at an incident scene.] Department guidelines declared that the FAO of the second-due engine company was responsible for Accountability Officer duties, if not involved in pumping or supply operations. In the event that the FAO of the second-due engine was engaged, it was assumed that the FAO of the third-due engine company would assume accountability officer duties.

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At **06:29:05**, L25's OIC radioed, "E102, they need some water." "E102 FAO (fire apparatus operator), you clear on water?" radioed Command at **06:29:19**. At **06:29:24**, E102's Ffr. #2 radioed, "102, we need water." At **06:29:30**, E102's FAO acknowledged, "Yeah, attack line one's water, getting it now. Hydrant, I'm ready for water. This is E102." At this same time Captain Broxterman's radio was "rejected" by other radio traffic on scene. At **06:29:48**, Command radioed, "E102 FAO, are you holding up interior water because of the hydrant water?" At **06:29:56**, E102 FAO replied, "No, sir. I didn't hear them call."

At **06:30:35**, E109's OIC radioed, "Command from E109, contact 102, have them pull out of this first floor, redeploy to the back. It's easy access. Conditions are changing at the front door." At **06:30:55**, Command radioed, "Interior from Command, did you copy?" At **06:30:58**, E25 staffed with four firefighters (an OIC, FAO, two firefighters) radioed on scene.

Figure 31: E102's and E109's initial hose line deployments.



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At **06:31:12**, Command radioed, "Interior from Command." At **06:31:21**, "L25 Search, could you have Exterior L25 get the positive pressure going ASAP?" At **06:31:41**, L25's OIC radioed, "I don't know if E102 has heard they're redeployed to the rear of the structure." At **06:31:58**, Command inquired, "Are they close in proximity to you?" L25's OIC replied, "No. I have not made entry into the -- or into the structure at this time" at **06:32:01**.

At **06:32:19**, Car 2508, now assigned the *rear sector officer* radioed, "Rear to Command, it's out a window and a rear patio door on the first floor. It's lapping up to the second floor. They need to get water on it quick." Command replied, "Okay, that's clear. Do we have a second line around the rear?" "We have a line back here. They may be able to knock down some of the exterior fire so it doesn't auto communicate up to the second floor" answered the rear sector officer.

At **06:32:40**, E25 is also assigned to the rear sector. At **06:32:54**, Command radioed, "Interior One from Command, someone from the interior respond." At **06:33:29**, an apparent open-microphone transmission is received from Ffr. Schira's radio. At **06:33:37**, a second radio transmission is received from Ffr. Schira's radio, but it was inaudible. At **06:33:46**, Command radioed, "Unit calling, repeat."

At **06:33:52**, the rear sector officer radioed, "Rear to Command, exterior fire is knocked down. However, it may be up in the attic. We've still got fire out two windows here in the back." Command acknowledges, "Okay, I've got personnel coming. Have you seen Interior One?" The rear sector officer replied, "Negative. I've got 109's back here with me." At **06:34:10**, Command radioed, "That's clear. E25, your crew is going to be RAT. Get set up. I have not heard from Interior One. Try to see, rear, if we can acknowledge or get some confirmation from Interior One." [RAT is the abbreviation for Rapid Assistance Team, which is a minimum of three fully equipped firefighting personnel on-site, in a ready state, for the immediate rescue of lost, trapped or incapacitated firefighter(s).]

At **06:34:29**, while monitoring (listening to radio transmissions) the fire ground radio traffic at their station, Engine 26's (E26) OIC radioed Command to ask, "Do you want...to make this run?". Command responds, "... head this was."

At **06:34:48**, E25's OIC radioed, "25 for Command, per ... (Ffr. #2), he was on crew one. He has lost contact with his crew at this point. He does not know where they're at. We need to do a PAR." Command acknowledges, "Is he inside or outside the structure?" E25's OIC responded, "Outside the structure. He advised he was humping hose in and lost contact with his crew." At **06:35:20**, Command radioed the rear sector officer, "One last time, have you seen Interior One? I have not had any radio contact with them within the last five-minutes." The rear sector officer replied, "Negative on

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contact with Interior One. I've got three from 109's back here with me." Command radioed, "Can you guys make entry from the rear safely? I'm concerned that we haven't got anybody on that crew. I'm considering calling a mayday."

At **06:35:50** and **06:36:29**, Command made two attempts to contact E25. At **06:36:42**, E25 FAO radioed Command, "I'm moving forward .... Would you like me to relay traffic for them?" Command replied, "Affirmative. I want to activate the RAT crew. I cannot make contact with Interior One." At **06:36:56**, E25 FAO acknowledged, "...that's clear. We'll go ahead and assume RAT 25, and we'll start our RAT procedures." Command advised, "I don't have any other help here, so I'm going to be doing both RAT work and command at the same time" at **06:37:07**.

At **06:37:25**, the rear sector officer radioed Command, "...we're at the back door. We can knock it down from here. Likewise, it's communicated to the second floor." Command acknowledges, "Okay, that's clear. Any word on Interior One yet?" The rear sector officer replies, "None whatsoever..." At **06:37:41**, Command radioed, "... let's consider this a mayday situation, and let's send in the RAT crew and see if we can locate them. Plus, we still have to fight this fire."

At **06:37:53**, Command requests a second-alarm assignment. At **06:38:49**, Engine 103, Engine 28, Fairfield Rescue (Butler County), Ladder 42, Ross Engine 11 (Butler County) are assigned to the incident as the second-alarm complement of companies.

At **06:38:24**, L25's OIC radioed Command, "Be advised, thermal imaging camera is showing the upper steps to the basement are completely blocked with fire. No sign of any injured crew in that area."

At **06:38:43**, Command radioed, "We have a mayday situation here. All units on scene switch to Channel 11. We have a mayday situation. We will continue to fight the fire, and we need to make entry with the RAT team." At **06:38:59**, L25's OIC reported, "L25, be advised there's no way we can make entry. We're going to have to knock the fire down before we make entry." At **06:39:13**, the rear sector officer reported, "...we've got some of the first floor knocked down. The second floor has flashed out the rear. We're going to try to get water on it from back here now." Command acknowledged, "Command clear. Switch to Channel 11. Make sure all crews are on Channel 11." At **06:39:43**, L25 Exterior Crew advises that they have set up PPV at the front door, and have started the fan.

At **06:41:01**, Mayday operations are declared by Hamilton County Communications Center and Fire Ground 11 is assigned.

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At **06:42:01**, RAT 25 radioed to Command that they are making entry into the basement. At **06:46:09**, RAT25 reported "... be advised we have found a hose line coming down the steps and are continuing search." After several failed attempts by RAT25's OIC to contact Command, a RAT25 firefighter successfully radioed at **06:47:16**, "... if you can have E102's FAO shut-down the hand line that Interior One had because it's punctured in the stairwell free flowing."

At **06:52:54** Car 2506 formally establishes the accountability sector and advises "...we need natural gas shut off. We have what looks like a natural gas fed fire."

At **06:54:47**, the RAT25 OIC radioed, "... be advised we are making entry up the stairs. We'll keep you advised on the situation."

After several calls for gas to be shut off, L25 Exterior crew announces that gas is shut off at **06:56:01**. L25 Exterior declares, "Gas has been shut off. It's on Side B, as in "boy." Gas has been shut off."

At **07:00:27**, E26's crew enters the building to continue RAT operations. They encounter RAT25 crew at the stairwell and exchange information prior to continuing their search.

At **07:02:21**, RAT25 exits the building.

At **07:06:56**, a radio transmission is announced, RAT operations, we're going to go defensive. We're going to re-do this whole operation so we can get a handle on who we've got to -- who do we got missing and who we don't."

At **07:07:15**, HCCC issues an Alert Tone to units operating on Squirrelsnest for an evacuation of the building. "Attention all fire units, ... this fire is now a defensive operation. All crews evacuate the building immediately."

At **07:08:08**, the rear sector officer requests permission to quickly check under a pile of debris in the basement on the Charlie side. At **07:08:19**, the crew checking the debris locates a downed firefighter. "Command from Rear, we have located a firefighter."

At **07:09:27**, the RAT sector officers radioed, "We got a person that we're pulling out of the basement. If you've got a medic crew, bring them up and forward if you can."

At **07:29:41**, the rear sector officer once again notifies Command of locating the second victim in basement. "Command from Rear, we've located a second firefighter. We need a second Stokes Basket."

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At **07:43:15** Mayday operations are declared complete by D25.

At **07:43:34**, the HCCC dispatcher announced by means of radio,

Attention all units, attention all units, on the Squirrelsnest LN detail, mayday operations are now complete. Repeating: The mayday is now clear. All units on the Squirrelsnest incident switch to Fire Ground 11. Repeating: Attention all units, per Squirrelsnest Command, the mayday operation is now complete.

Repeating: The mayday operation is clear. All units switch to Fire Ground 11.

*The following sections are summaries as submitted by the first alarm fire companies actions based on individual post-incident statements and interviews. Many of the events occurred simultaneously and may not be in the order listed below.*

### **Engine 102**

E102 received the dispatch at 06:13:02 from HCCC. E102 acknowledged the detail and radioed en-route at 06:14:06. While traveling to the scene, Capt. Broxterman reviewed the map-book for the approximate location of the building and hydrants in the area. As E102 arrived in the area, the FAO proceeded down the street as directed by the Capt. Broxterman and subsequently E102 passed the driveway by approximately 740-feet. Capt. Broxterman reviewed the map-book a second time and exited the apparatus to back the apparatus as addressed in the department's vehicle backing policies. Capt. Broxterman stopped the vehicle, re-entered the vehicle and reviewed the map-book a third time. Capt. Broxterman then exited the vehicle a second time to continue backing procedures. As E102 arrived at the driveway, E109 appeared in the FAO's mirror. At this time, the incident was upgraded to a working structure fire by HCCC.

Capt. Broxterman re-entered the cab of E102 and was informed of the update by the E109's OIC on FG2 and acknowledged the update. At this time, Ffr. #2 dismounted the vehicle to *street-lay* the five-inch large diameter hose supply line and E102 proceeded down the driveway while deploying approximately 500-feet of supply line to the front of the building. Capt. Broxterman radioed "E102 on scene, moderate smoke showing, E102 will be Squirrelsnest Command" to all responding units on FD West at 06:24:01.

As E102 arrived in front of the building the FAO was instructed by Capt. Broxterman to interview the homeowner for the location of fire and any remaining occupants. Capt. Broxterman exited the vehicle and began to don personal protective equipment (PPE) and self contained breathing apparatus (SCBA). While donning PPE, Capt. Broxterman was advised by the FAO that the fire was in the basement which Capt. Broxterman acknowledged. Ffr. Schira dismounted the apparatus and deployed a 150-foot pre-connected 1¾ -inch hose line to the front main entrance door. Ffr. #2 proceeded

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to walk from the street to the front of the building along the driveway ensuring the five-inch supply line was off to the side of the drive for ladder company access.

Capt. Broxterman and Ffr. Schira proceeded to the front entrance of the building, and at 06:26:56 transmitted to Command that they were making entry into the building. At 06:27:03 Capt. Broxterman transmitted "[102 FAO] we need water." This transmission was not acknowledged by the FAO. During this time, the E102 FAO was completing the five-inch supply line connection into E102's intake utilizing the short-section of supply line from the front of the apparatus. Ffr. #2 proceeded to the front of the building and "kicked-out" any kinks in the attack-line going into the building then donned an SCBA and entered the building.

At 06:27:52, Capt. Broxterman transmitted on FG2, "E102 making entry in the basement, heavy smoke." Between 06:28:40 and 06:29:07, there were four *rejected* transmissions from Capt. Broxterman's radio (as verified by the radio ID log). At 06:29:24, Ffr. #2 transmitted a request for water from E102. E102 FAO acknowledged this transmission and stated "...attack line one's getting water now" at 06:29:30. (During this time it is unclear as to the location and activities of E102's interior crew) At 06:30:16, E109 FAO transmitted that the supply line had been connected to the hydrant and was charged.

According to the radio transmission logs, between 06:33:23 and 06:33:44, there were four logged radio events attributed to Ffr. Schira's radio.

Just prior to 06:34:48, Ffr. #2 was seen exiting the building and had a face-to-face conversation with the officer of RAT25 advising that he had been separated from the rest of the interior crew of E102. RAT25 OIC relayed this information to Command and subsequently a mayday operation was begun by units on the scene.

### **Engine 109**

E109 responded Code2 according to Colerain Fire & EMS policy to the initial dispatch of an automatic fire alarm. While en-route, E109 OIC advised responding units on FG 2 that this address was a long-lay situation. Upon E109's arrival on Squirrelsnest, E109 OIC stated that, "E102 was visible at the top of the driveway." At this time, HCCC advised units that according to a resident's phone call, the incident was now a working structure fire. E109 OIC requested this information be re-dispatched by means of HCCC and then called E102 OIC (Capt. Broxterman) to confirm that she was aware that it was now a structure fire. Capt. Broxterman radioed acknowledgement.

E109 OIC advised E109 FAO to drive past the driveway, turn around in the next available driveway and then proceed to the hydrant at 5712 Squirrelsnest. As E109 came

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to a stop at the hydrant, the FAO was instructed to complete the hydrant connection with E102's supply line and the OIC instructed Ffr. #1 to follow E102's supply line down the driveway to further ensure that it was out of the way of other responding units. Ffr. #2 and E109 OIC began assembling their equipment prior to advancing to the building. At this time, L25 and D25 arrived on the scene and proceeded down the driveway.

E109 OIC performed a face-to-face with Command to discuss further size-up of the building and advised that E109's FAO was busy with water supply and to assign accountability to another unit. E109's crew proceeded to the front of the building performed a 360-degree assessment proceeding from side Alpha, Beta, Charlie and Delta. E109 OIC noticed heavy fire from the rear of the building from the sliding glass doors and the adjacent window (basement-level). Upon arriving back on Side Alpha, E109 OIC instructed E109's Ffr. #1 and Ffr. #2 to pull a second attack-line from E102 to the rear of the building.

E109 FAO charged the hydrant and supplied E102 FAO with water at 06:30:16. E109 FAO then proceeded down the driveway to join the remainder of E109 crew at the rear of the structure.

E109 OIC advised L25 OIC face-to-face to have E102 interior crew pull out and re-deploy to the rear of the structure. At 06:30:35 E109 OIC radioed Command of changing fire and smoke conditions, and to have E102 crew re-deploy to the rear of the building for easier access to the basement. Command acknowledged the radio traffic.

E109's crew advanced to the rear of the building and noticed that the fire coming out of the window and doors (basement-level) was extending upward on the exterior running along the soffit line. E109 OIC sent Ffr. #1 to E102 FAO to request that the second hand-line be charged. E109 crew knocked-down the exterior fire in the rear and held position under the command of the rear sector officer being instructed not to direct water into the building through the open doors or windows.

After the RAT25 crew was activated by Command at 06:36:48, E109 crew was met by RAT25 crew coming to the rear preparing to make entry into the basement. E109 crew provided support and fire control for RAT 25 operations in the basement. After discovery of downed firefighters, E109 crew assisted with removal efforts and was then directed to rehab.

### **Ladder 25**

L25 responded Code 2 to 5708 Squirrelsnest LN for the initial dispatch of an automatic fire alarm activation. Upon receiving updated information from HCCC that the incident was now a working structure fire. L25 upgraded their response to Code 3.

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L25 arrived on the scene at 06:25:38 and pulled down the driveway, stopping immediately behind E102. As addressed in Colerain Fire & EMS policy, L25's four-person crew was divided into two crews. The Interior Crew consisted of L25 OIC and Ffr. #1 and the Exterior Crew consisted of L25 ATO and Ffr. #2.

### L25 Interior Team Activities

L25 Interior Crew was directed by Command to advance to the structure to perform a primary search. They approached the front door, assembled their PPE, hand tools and TIC camera. While they were preparing to make entry, E109 OIC advised all crews of changing fire conditions and advised E102's crew to re-deploy to the rear of the structure. L25 Interior Crew attempted to make contact with E102's crew, but was unable to contact them from the front porch or to verify their location with the TIC. L25 Interior Crew then proceeded to the rear of the structure to assess fire conditions. Upon returning to the front the crew did not make entry due to conditions. L25 OIC requested PPV to be set up at the front door.

L25 Interior Crew then assumed a position in the rear of the structure and came under the supervision of the rear sector officer.

### L25 Exterior Team Activities

L25 Exterior Crew proceeded towards the front of the structure with two (2) positive pressure ventilation fans (one from E102 and one from L25). They positioned the fans in the front doorway however did not start them until requested. After placing the fans, L25 Exterior Crew proceeded around to the rear of the structure and fell under the supervision of the Rear Sector Officer. At approximately 06:55:00 there were several calls on the radio for the gas to be shut off. L25 Exterior Crew radioed that the gas had already been shut off. L25 Exterior Crew remained in the rear of the structure for the remainder of operations.

## **District 25**

D25 responded to 5708 Squirrelsnest Code 2 according to Colerain Fire & EMS response guidelines. As the incident was upgraded to a structure fire, D25 upgraded his response to Code 3. On his arrival at 06:26:35, E102 had already laid its supply line to the front of the structure and L25 had pulled down the driveway and parked behind E102. D25 assumed a position directly behind L25 and then subsequently assumed Command.

Command received the original on-scene size-up from Capt. Broxterman and then additional information from L25 OIC that there was a working fire inside the structure.

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Command radioed that he was having a difficult time seeing the structure due to his position behind the ladder truck.

As the incident evolved, Command remained in position and directed units in fire attack and scene support. After receiving an update from E109 OIC to have E102 crew redeploy to the rear of the structure, Command attempted to have E102 acknowledge the change in tactics. Having received no response after repeated attempts, Command began to suspect that E102's crew was in trouble.

Command activated RAT25 crew at 06:36:48 and declares a "mayday situation" at 06:37:41 on FG2 then requested a second alarm and staff notification from HCCC. Command instructed all firefighting operations to change fire-ground channels to FG11 in order to clear FG2 for rescue operations.

Car 2501 arrived on scene and assumed "Operations Command" on FG11 so D25 could concentrate on RAT operations. From this point, D25 continued to manage the mayday operations on FG2 from his position until the mayday operation was terminated at 07:43:15.

### **Engine 25 (RAT25)**

E25 crew responded as part of the alarm upgrade for a structure fire. While en-route to the scene, E25 was assigned accountability by Command. Upon arrival at 06:30:58, E25 crew proceeded to the front of the structure with necessary tools and RAT equipment. E25 FAO began the accountability process, however, upon hearing radio traffic concerning a possible mayday, moved forward to join E25's crew. At 06:32:40 E25 was assigned to report to the rear sector by Command. Approximately one minute later, Command re-assigned E25 to RAT responsibilities. E25's crew was joined by E25 FAO and made a recon of the exterior of the structure side A-B-C-D. After returning to the front yard, E25's OIC encountered Ffr. #2 of E102 who reported losing contact with Capt. Broxterman and Ffr. Schira. At 06:34:48, E25's OIC notified Command that E102's crew had become separated and proceeded to set up for RAT operations. At 06:36:48 Command activated RAT25. At 06:42:01 RAT25 advised Command they were entering the rear of the structure through the basement. R26's two-person crew was also assigned to RAT 25 at this time. Using a search line, RAT25 crew started a left handed search pattern through the basement. Upon reaching the AB corner of the basement the crew found a hand line at the bottom of the stairs that was free flowing from a break in the hose line. The crew radios to have the hose line shut down. This information was also relayed to the Rear Sector Officer via face-to-face in the rear of the structure.

RAT 25 was ordered out of the basement by the Rear Sector Officer due to concerns of possible structural compromise from sagging first floor beams. RAT 25

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exited the structure, once the structural concern was resolved, they re-entered the structure without Ffr. #2 due to being out of air and R26 crew who was reassigned to other duties in the rear. They proceeded into the basement following the same search pattern back to the bottom of the stairs. As they proceeded to the top of the stairs, they encountered E26's crew where they exchanged information concerning building conditions, fire conditions and what areas had already been searched. At this time RAT25 crew gave E26 crew their TIC camera (E26's TIC had failed), and promptly exited back through the basement due to crew being low on air.

RAT25 crew proceeded around to the front of the building and was directed to rehab.

### **Car 2508 (Rear Sector Officer)**

At 06:27:41 Car 2508 arrived on scene and reported to Command for assignment. 2508 was assigned as the Rear Sector Officer (RSO) and proceeded to the D side with the crew of E109 who were advancing a hose line to the rear. At 06:32:19 RSO reported fire out the rear windows (basement-level), conferred with Capt of E109 and requested permission from Command to knock down exterior fires. RSO instructed rear sector crew not to direct streams into structure. E109's crew proceeded to knock down the exterior fire. No indication of interior fire suppression efforts were noted at any time.

Between 06:31:12 and 06:35:28 there were several radio transmissions between Command and RSO inquiring about the status and location of Interior 1. RSO radioed that there had not been any contact with the interior crew. Command acknowledged the traffic and instructed RSO to begin interior suppression and entry. RAT25 was activated by Command at 06:36:48.

From a position in the rear of the building, the RSO directed the initial RAT operations and suppression efforts. RSO observed a possible compromised structural beam in the basement, and ordered RAT 25 out. The RSO later determined the structure was safe and RAT operations continued. The RSO continued to keep a physical accounting of the rear sector suppression and RAT crews throughout the incident until accountability was formally established by 2506 at 06:52:54.

At approximately 07:05:28 E26 crew communicated with the RSO and reported an area on the B-C side of the building's first floor had collapsed into the basement. At 07:06:57 Command had called for defensive operations while E26 crew received permission from RSO to quickly check under debris on side C. At 07:08:19 RSO informed Command that E26 had found a downed firefighter.

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The remains of a helmet and SCBA were passed outside and placed on a table where the RSO instructed that nothing was to be touched. The RSO continued to provide direction and oversight during the recovery efforts inside the basement. The rear sector was re-assigned to units from Ross Twp. F.D. after the recovery and Car 2508 was directed to rehab.

### **Rescue 26**

At 06:24:42 R26 responded Code 3 according to Colerain Fire & EMS policy when the alarm was upgraded to a structure fire. Upon arrival at the scene, the Driver of R26 provided scene lighting then crew reported to Command's location for assignment. R26 was instructed to report to E25 OIC and join RAT 25's crew. R-26, (now part of RAT 25) proceeded with crew to the rear of structure, gave accountability tags to the Rear Sector Officer and entered the basement. A left hand search pattern was conducted and RAT 25 discovered a hose line at bottom of basement stairs. RAT 25 then exited the basement per orders of Rear Sector Officer. R26 crew was then relieved of RAT duties and instructed to assist with deploying a hose line to the upper (first floor) rear deck and support L25 crew with extinguishment efforts.

Once on the upper deck R26's Driver noted the first floor of the structure had collapsed and notified Rear Sector Officer of the findings. Extinguishment efforts continued at the B-C side of the structure until radio traffic indicated one firefighter had been found. R26 and L25 crews were then instructed to help extricate and remove the second firefighter from the basement. R26 and L25 crews became low on air and exited the structure. R26 crew assisted in moving a stokes-basket to the front of the structure and was then directed to rehab.

### **Engine 26**

At 06:34:25, while on station monitoring radio traffic, E26's company officer contacted Command on FG2 and asked if they should respond to the incident. Command advised them to respond. E26 responded Code 3 to the scene and arrived on scene at 06:45:53. E26's company assembled in the front yard and upon receiving orders to search for E102's crew proceeded through the front-main entrance door and followed the initial attack line down the main hallway and into the kitchen. E26's company encountered RAT25 at the top of the stairway from the basement and was briefed on building and fire conditions, and areas that had already been searched. A partial collapse of the first-floor was discovered in the Beta-Charlie corner by E26, which was visually searched with nothing found. E26's returned to the basement area and after a brief search, Command ordered defensive operations. E26 requested permission from the RSO to rapidly search the area underneath the collapsed floor. With permission granted, E26 entered the area and began moving debris. E26 discovered pieces of PPE which led them

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to the location of the first firefighter. They reported their findings to the RSO and left the downed firefighter in place for investigational purposes while they exited the building by means of the rear basement door. E26 OIC had a face-to-face conversation with Car 2501 and after several minutes, E26 was instructed to re-enter the building and recover the body. While doing so, they found the second firefighter. During removal of the first firefighter, members of E26 began to run low on air and exited the building. Upon exiting, E26 crew provided location directions to the relief crew that was entering to remove the second firefighter. E26 then reported to rehab.

### **Findings, Discussions and Recommendations**

**FINDING #4.1: E102's officer misinterpreted the street map information, which significantly hampered their effectiveness and response time.**

E102's FAO and Capt. Broxterman had been assigned to Station 102 since December 2, 2007. Previously, both individuals had been assigned to the station on numerous shift assignments on a rotational or detailed basis. As a captain of this particular station, it is routine for the officer to be detailed to the other four stations to fill-in for off-duty captains. This is due to the relatively low-level of incident activity of Station 102's response area. During the absence of the assigned captain, an acting company officer would fill the roles and responsibilities of the captain.

As part of each fire company's resource inventory are street map books of the Township that provide pre-incident action plan information that identifies the location of the nearest fire hydrant to an incident address. During a response to an emergency incident, it is the responsibility of the FAO and OIC to collaborate to determine the most appropriate route of travel to the scene. Typically, this is done with the aid of the hard-copy street map book. While responding to this incident, Capt. Broxterman's misinterpretation of the street map information on page 33A resulted in the company passing the driveway and the nearest fire hydrant to the incident address that caused a significant delay of the first-due engine company's arrival on-scene. Post-incident interviews determined that Capt. Broxterman had commented that 5708 Squirrelsnest was immediately past the second hydrant on Squirrelsnest (Figure 32). However, further review of the map page indicated that she had confused the beginning of Dunlap Rd with the beginning of Squirrelsnest Lane. The residence was, in fact, immediately before the first hydrant on Squirrelsnest (Figure 33).

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Figure 32: Map page 33A as it was on April 4, 2008.

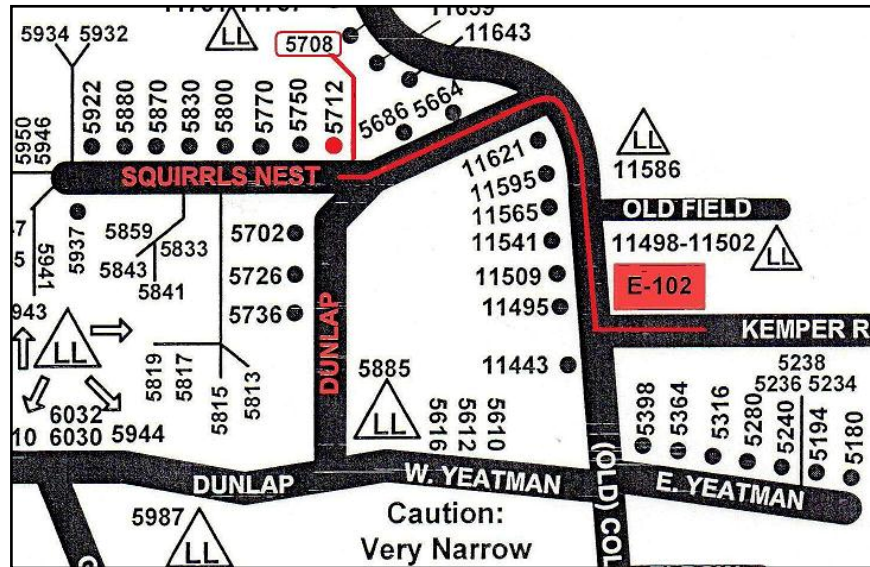
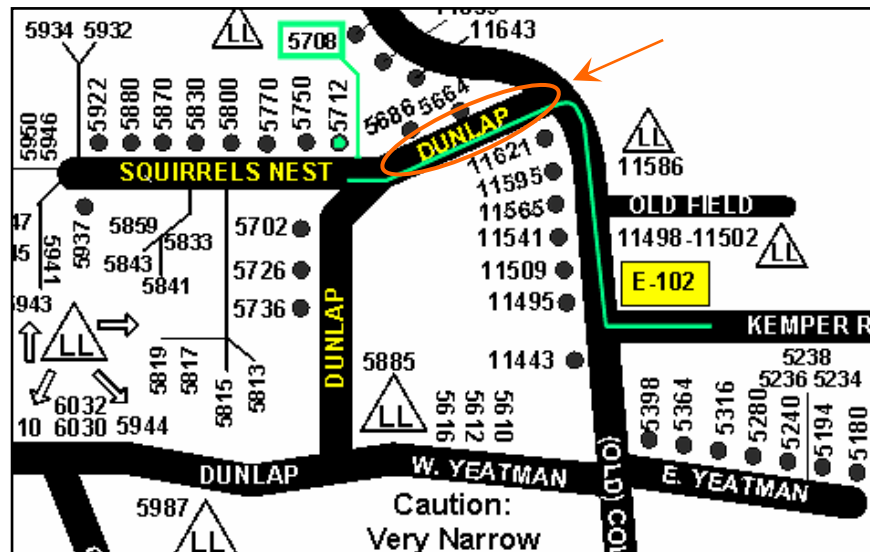


Figure 33: Map page 33A as revised in July 2008.



In addition, available pre-incident action plan information also indicated that the address was approximately 500-feet from the fire hydrant and that the driveway was approximately 450-feet in length from the street.

As the second-due engine company (E109) entered the street, its captain observed E102 moving in reverse towards the driveway after passing the incident address on the initial approach. It was estimated that E102 had driven approximately 750-feet down the street before realizing they had passed the incident address.

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Approximately *11-minutes elapsed* from the time E102 went en-route to the scene to the time which they reported on-scene. By driving the response route to the scene from the fire station, it is estimated that during normal conditions the response time should be *two to four-minutes*.

**RECOMMENDATION #4.1:** Fire departments should require the training and utilization of pre-incident action plans to enhance tactical decision-making during incident operations.

Firefighting operations take place in stressful, time-sensitive environments. Delaying operations, even slightly, especially during the critical initial phase when the first arriving resources are committed, can adversely affect subsequent operations and the outcome. Delays caused by confusing alarm information, water supply or fire hydrant location, unfamiliarity of a response area, or ineffective communication systems will have a ripple effect on the other portions of the operation. During these delays, the fire will be growing exponentially.

Firefighters perform their functions during all times of the day or night, in any weather conditions, and frequently in unfamiliar environments. Their work environment is dangerous, mentally stressful, and physically exhausting. Decisions must often be made without an ideal amount of information, due to the many unknowns on the fire ground (such as what is on fire, how much is burning, where the fire is spreading, and where the occupants are located).

These factors stack the deck against the safety of firefighters. Even simplifying the firefighters' job in small ways will increase the level of safety for them, and thereby for building occupants. Design features that save time or personnel can make a great difference. Any feature that provides additional information regarding the fire, the building, or the occupants, as well as any method to speed the delivery of this information also helps.

Pre-incident plans (also known as *preplans*) are documents prepared by fire departments to assist in emergency operations in specific areas or occupancies. They should contain the location of, and information about, the fire protection features. Preplans are usually prepared and maintained by the fire company that normally responds first, or is *first due*, to a particular area or occupancy. However, the best pre-incident planning cannot overcome situations where the first due unit is committed on another response, out of position, or out of service. Nor can it foresee changes in personnel. It is simply unrealistic to count on all responding personnel to be aware of the pre-incident plan.

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All company officers and FAO's must be familiar with their primary response areas. This can only come from exposure to the area in the form of drivers training on the roads and review of maps of the response area. Street locations, addresses, hazards and hydrant locations are just a few of the significant issues facing the company officer and FAO. Routine and regular driving of the streets and roads in their primary response area will increase the familiarity of these critical items and enhance the efficiency of the response.

Pre-incident action planning makes sense, but it will always have limitations. Fire departments and firefighters that are more familiar with their first-due response areas, buildings and their associated features are better prepared to deal with fires and other emergencies.

**FINDING # 4.2:** E102's officer failed to properly analyze the scene by not performing a 360-degree scene size-up to determine an overall strategy, and implement safe and effective firefighting tactics.

After the apparatus was positioned in front of the building, E102's FAO was ordered by Capt. Broxterman to, "Ask the homeowner where the fire [location] was", which was indicated to be in the basement by the male homeowner. As this was taking place, Capt. Broxterman continued donning her protective clothing ensemble (coat, helmet and self-contained breathing apparatus).

Although E102's officer provided a brief radio report of conditions observed upon arrival, she did not properly evaluate the scene so as to develop a basic strategy for implementation of safe and effective firefighting tactics. Had the officer visually evaluated the Charlie side of the building, the advanced fire conditions may have been noted, and that the lower level fire area was accessible by means of an exterior entry door for a more *direct* fire attack from the *interior unburned side*. This means that firefighters enter a building and position the attack hose line between the fire and the uninvolved portions of the building. This direction of fire attack is *preferred* because it is likely to contain the fire, protect occupants, and push heat and gases out of the building if ventilation has been performed. On the other hand, danger increases significantly when attacking from the unburned side and is not always practical based on fire location, intensity, and building construction.

**RECOMMENDATION #4.2a:** Fire departments should develop and ensure Standard Operating Guidelines that require first arriving personnel to perform a complete scene size-up is conducted before beginning firefighting operations.

A thorough size-up provides the foundation for deciding strategy and tactics. It provides the IC and subsequent arriving fire companies with a general understanding of

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fire conditions, building construction, and other special considerations such as building access, utilities and exposures. Without a complete and accurate scene size-up, IC's and company officers will have difficulty coordinating firefighting efforts.

In implementing safe tactics, a risk benefit analysis must be considered in determining all operations; the risk of an action needs to be evaluated against the probable benefit that may be reasonably and realistically expected. This is especially true when firefighters choose or are ordered to operate directly above a fire. This places firefighters in an extremely hazardous position, as they are operating in extreme heat and smoke, and they may encounter sudden fire conditions or fire weaken floor areas, as was the scenario during this incident.

From a strategic perspective, IC's and company officers must integrate risk management into the regular functions of incident management. The concept of risk management must be utilized on the basis of the following principles:

- Activities that present a significant risk to the safety of personnel shall be limited to situations where there is a potential to save endangered lives.
- Activities that are routinely employed to protect property shall be recognized as inherent risks to the safety of personnel, and actions shall be taken to reduce or avoid these risk.
- No risk to the safety of personnel shall be acceptable when there is no possibility to save lives or property.

**RECOMMENDATION #4.2b:** Fire departments should incorporate a fourth benchmark into their incident management system that indicates that a complete initial size-up has been accomplished.

The initial size-up is the most important since most tactical decisions are based on this evaluation of any emergency incident. Benchmarking is used in incident management to identify completion of the following incident priorities:

- *Rescue:* at the completion of a primary search, an *All Clear* is transmitted;
- *Fire Control:* when forward progress of the fire has been stopped and the fire is controlled, a *Fire Under Control* is transmitted; and
- *Property Conservation:* when all salvage and overhaul operations have been completed, a *Loss Stopped* is transmitted.

The fourth benchmark informs additional responding companies and units that a complete size-up of the fire building has been accomplished. In addition to the aforementioned benchmarks, the fourth benchmark should be the *first* benchmark used at all building fire incidents. For example, *Size-up:* at the completion of a 360-degree view

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or walk-around of the fire building, “*Size-up Complete*” and critical findings are transmitted. Battalion Chief Jimmy Taylor of Cobb County, GA Fire & Emergency Medical Services discusses the necessity of the additional benchmark in a *Fire Engineering* journal article titled, *The Fourth Benchmark*. The chief states,

This simple benchmark is needed so that everyone responding and on the fire ground is aware that a complete initial size-up, including a walk-around, has been done. The walk-around is the most important part of this benchmark because it will give you the most information about the building. (2007)

**FINDING # 4.3:** E102's personnel entered the building with knowledge of *working fire conditions* without a charged hose line.

The first attack hose line deployed from E102's apparatus was a 150-foot pre-connected 1¾-inch hose line with an automatic nozzle. An automatic nozzle is a type of fog nozzle (an adjustable nozzle that permits the pattern to range from a straight stream to a narrow fog to a wide fog stream) that is designed to maintain a relatively constant pressure over a wide range of flows. The attack line was stretched to the main entrance door by Ffr. Schira, along with the remaining crew from E102. This crew was attempting to perform an aggressive interior fire attack so as to locate and contain the fire to the area of origin.

According to radio communication transcripts, there were three transmissions between 06:27:03 and 06:29:24 requesting the initial attack line to be charged by the FAO. The noise level near the apparatus pump and engine is believed to have impaired the ability of the FAO to hear and respond to radio traffic. This is evidenced by radio traffic between the IC and E102's FAO as, "E102 FAO, are you holding up interior water because of the hydrant water?" "No, sir. I didn't hear them call."

Entering a building or fire floor of a known working fire without a charged hose line exposes personnel and does not provide a safety line for personnel to follow directly to an exit. According to the NFPA, Standard 1500, *Fire Department Occupational Safety and Health Programs*, Chapter 7.1.2, "Protective ... equipment shall be used whenever the member is exposed to the hazards for which it is provided".

**RECOMMENDATION #4.3:** Fire departments should develop written policies and procedures and provide continual training that addresses entering buildings with charged and uncharged attack hose lines.

The successful operation of the initial hose line often governs the overall success of the firefighting operation, as many fires can be suppressed using only this initial hose line. According to Vincent Dunn,

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The most important firefighting operation at a building fire is stretching the first attack hose line to the fire. A properly positioned and functional fire attack line saves the most lives during a fire. It confines the fire and reduces property damage. Searches will proceed quickly, rescues will be accomplished under less threat, sufficient personnel will be available for laddering, ventilation will be effective, and overhaul above the fire room will be unimpeded.

Firefighters should continually train on standard operating procedures including but not limited to establishing effective water supply, proper hose deployment, and advancing and operating hose lines to ensure successful interior attacks. In the book, *Modern Suburban Fire Fighting*, Sylvia discusses the role of the pump operator,

As fire attack lines are deployed from the pumping apparatus, the pump operator must learn to keep a watchful eye on the action and charge the line at the appropriate time.... The pump operator, with practice can learn to get water to the nozzle in a minimum amount of time consistent with the desirability of keeping the line dry for stretching to the attack position. (1983, p. 11)

Refresher training should be provided to all firefighters on a regular basis or as needed to ensure effective fire fighting skills are maintained.

**FINDING #4.4:** No back-up attack hose line was deployed following the entry of E102's interior team into the building.

At this incident, a second attack hose line was not immediately deployed to provide back-up for the initial attack hose line deployed by E102's interior team. Instead, the second-due engine company (E109) deployed the second pre-connected 1¾-inch attack line from E102's apparatus to the rear of the building for fire control in the basement area. When conditions deteriorated, there was not a fire company or team with a hose line to protect E102's team on the initial attack line, to provide additional flow or placed to protect and provide an exit route.

Decisions on the fire ground are made in a condensed timeframe and often times with limited information. The committee commends the E109 OIC for his swift and decisive decision making and it must be presumed that E109's OIC fully expected E102's team to hear the radio transmission to pull-out and re-deploy to the rear of the building. It is evident what the intentions were with the decision that was made. However, no one that morning would have ever thought the interior crew would never exit the building.

In retrospect, while pending visual contact of the interior team, the back-up hose line could have been better deployed to the front of the building to assist with the interior team's egress. This could have been an opportunity to protect and lead the interior team to safety.

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**RECOMMENDATION #4.4:** Fire departments should deploy back-up attack hose lines as part of the initial fire attack.

Back-up hose lines are *not* used to attack fire in another area or for exposure control. They are deployed, charged, and on stand-by in the same general area to back-up the *initial* attack line.

Whenever a primary attack line is deployed a second or back-up line must also be deployed whenever there is any considerable amount of fire or there is reason to think there is fire extension. The second-due engine company should always have this task in mind. The primary responsibility of the second line is:

- To provide protection of the primary egress for the initial attack crew; and
- In the event that the volume of fire overwhelms the initial line, the back-up line can move up to provide additional fire flow.

The International Fire Service Association (IFSTA) textbook, *Essentials of Fire Fighting and Fire Department Operations, 5th Edition* discusses company-level tactics for the second-due engine company as, "Once the water supply has been established, the second company proceeds according to the following priorities: Back up the initial attack line, Protect secondary means of egress..." (2008, p. 789).

The back-up hose line should be at least equal in size and attack volume to the initial attack hose line. It should be deployed and positioned behind the initial line to perform its primary duties. However, it should not hinder advancement of the first line as long as the first line is making progress. Each hose line, regardless of how many there are, should have a company officer or someone in charge to maintain accountability of personnel and to coordinate efforts with other officers during attack.

Klaene and Sanders discuss in their book *Structural Fire Fighting: Strategy and Tactics* that,

Back-up lines are needed to protect the crew on the initial attack line, to provide additional flow if needed. Given that a single 1¾" hose line is sufficient for most residential fires (in terms of flow), the back-up hose line is additional insurance.

Although back-up hose lines can be used to augment the initial attack, the defined purpose ... is to provide additional flow ..., thus providing a measure of protection for firefighters combating the fire. (2008, p. 216)

In addition to the initial attack hose line, Klaene and Sanders list a number of additional hose lines to protect egress routes and protect external exposures, "Hose line(s) required to meet the rate of flow in the immediate fire area, back-up hose line(s) for the

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immediate fire area, hose line(s) to protect egress routes, hose line(s) to protect internal exposures ..." (2008, p. 216).

It is difficult to develop a definitive rule or rules about where the back-up line should be positioned, but it must be charged, ready for use and positioned *close* to the initial attack line. However, if the objective is to provide protection and additional fire flow to the initial attack line, the back-up hose line officer should be positioned so that it allows him or her to have a broader view of the fire attack and meet the objective while serving as an additional set of eyes for the initial attack team and incident commander.

**FINDING #4.5:** During this incident there is anecdotal evidence that suggest that the E102's firefighters led the company officer, instead of the officer leading the company.

During the initial phase of this incident, the company officer was literally playing *catch-up* by being unprepared for what the company faced upon arrival. From the time the company departed the fire station, there were several examples of the officer falling behind the incident as it unfolded including the following: a) not being dressed in her full personal protective ensemble (PPE) before mounting the apparatus; b) passing the address entrance upon the initial approach to the incident; c) knowing that the additional responding companies were either already there or close to the scene; d) not having a complete picture of the fire building and conditions; and e) subordinate personnel initiating and engaging in tasks without direction.

It is believed that as the incident unfolded initially, the company officer became overwhelmed and *mentally* stressed as a result of the aforementioned factors. In such situations, mental stress may lead to mistakes and poor decisions made in the spur of the moment. Fire company officers are responsible for their companies or teams, (e.g., what the company or team accomplishes). Company officers can not allow their people to freelance, self-assign, or run off with hose lines or tools, because they are ultimately responsible for their accountability and safety. Freelancing can be simply defined as firefighters who act as individuals without proper authorization from their supervisors rather than as part of a fire company or team with clearly defined task assignments provided by a supervisor. During a fire attack, the officer should gain control of the situation quickly and assertively by positioning himself or herself so he or she can monitor their teams, fire conditions, progress and still maintain radio communications with other companies or teams, and the IC. If a fire officer senses the situation is becoming unmanageable, he or she **MUST** stop the operation and re-evaluate the situation.

*Best practices* emphasize the need to prepare for incident response before the alarm. Building a toolkit that contains knowledge and capabilities of personnel, informing personnel of expectations, train the staff, and understand roles and

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responsibilities is the absolute necessary approach to handling emergency incidents in a controlled manner.

**FINDING #4.6:** Crew integrity was compromised by the personnel of E102 during this incident. Upon attempting to exit, both Capt. Broxterman and Ffr. Schira became separated from the hose line, possibly causing them to become disoriented.

One of the important considerations in incident management systems and accountability systems is crew or team integrity. In following the concept of crew integrity, firefighting teams are formed with a *minimum* of two personnel that enter a hazardous area together, perform their assigned task together and exit together. Remaining in contact with ones company or team is essential to crew integrity, efficiency, and safety. Verbal communication is one way to remain in contact, but provides limited results in reduced visibility. Contact with a search rope or hose line is effective, but has its obvious limitations, especially if one loses contact with the rope of hose line. To maintain crew integrity, the IFSTA textbook describes it as, "by remaining in physical, voice, or visual contact with other team members..." (2008, p. 76).

During this incident, crew integrity was compromised by the personnel of E102. As previously indicated, firefighter interviews indicated that during this incident, E102's team of three personnel (Capt. Broxterman, Ffr. Schira, Ffr. #2) were observed entering the building together. Although E102's team initially had crew integrity, Ffr. #2 separated from his team to advance additional hose line to attack the fire and was most assuredly out of visual contact. Ffr. #2 reversed his travel as far back to the building's main-level front door to obtain additional hose line. While Capt. Broxterman and Ffr. Schira were attempting to exit by means of the main level, they likely lost contact with the hose line and became possibly disoriented upon the rapid deterioration of conditions. *It is believed that their loss of contact with the hose line played a critical role in their inability to exit the building, resulting in their subsequent distress.*

In July 2003, Captain William R. Mora of the San Antonio, Texas Fire Department completed a study titled *U.S. Firefighter Disorientation Study*. In reviewing the study, several aspects of the findings showed a clear relationship to this incident. According to the study, it cited the following sequence of events that causes firefighters to become disoriented in building fires,

*A fire in an enclosed structure with smoke showing occurs. The arriving fire company immediately initiates an aggressive interior attack to search for the seat of the fire. During the search, the seat of the fire cannot be located and conditions deteriorate with the production of heat, smoke and prolonged zero visibility. As companies perform an emergency evacuation due to deteriorating conditions, handline separation occurs or tangled handlines are encountered. Disorientation then occurs as firefighters exceed their air supply, are caught in flashovers or*

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backdrafts, or are trapped by the collapsing floor or roof. When the firefighters are not located quickly enough, the outcome is *fatalities or serious injuries*. The disorientation sequence usually plays out in a structure that does not have a sprinkler system or one that is inoperable. (p. 5)

**RECOMMENDATION #4.6a:** Fire departments must take all possible measures to ensure that firefighters maintain crew integrity to provide for their safety and to prevent freelancing during fire ground operations.

**RECOMMENDATION #4.6b:** Firefighters must maintain contact with the hose line during times of reduced visibility. Properly following the hose line will lead back to the point of entry into the building.

The concept of crew integrity is paramount to ensuring firefighter safety and helps to prevent freelancing. Simply stated, firefighters are formed into companies or teams that enter the hazardous area together, perform their assigned task together and exit together. As a company or team, they formulate tactics and perform tasks that will most efficiently and safely accomplish what is to be done. Through continual training, the concept of crew integrity should become second nature and firefighters will understand that working as an individual is neither desirable nor tolerated.

Fire departments must take all possible measures to maintain crew integrity to prevent freelancing at an incident scene. Company officers and training instructors should work within the context of ongoing training programs to create a culture in the department's ranks that freelancing is never acceptable or tolerated. Company officers and safety officers on incident scenes need to be constantly vigilant with respect to crew integrity and immediately intervene if they see that freelancing is occurring.

Team continuity involves knowing who is on your team and who is the team leader; staying within visual contact at all times (if visibility is obscured then teams should remain within touch or voice distance of each other); communicating your needs and observations to the team leader; rotating to rehab and staging as a team; and watching out for your team members (e.g., practice a strong *buddy-care* approach). Following these basic rules helps reduce the likelihood of serious injury or even death by providing personnel with the added safety net of fellow team members. Teams that enter a hazardous environment together should leave together to ensure that team continuity is maintained.

In the end, the company officer or team leader is responsible for the firefighters assigned to him or her, the firefighters are responsible for the officer, and each firefighter is responsible for the firefighters around him or her. Ultimately, each and every firefighter is also responsible for his or her own safety. Crew integrity is about all

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personnel of the team being fully aware of where every other person of the team is operating. Teams should enter and leave a building intact.

**FINDING #4.7:** The ladder company did not effectively engage in assigned duties as outlined in department guidelines.

Colerain Fire & EMS's ladder company teams also are responsible for removing heat, smoke and gases to allow greater visibility and permit engine company teams to move rapidly and safely within a fire building or exposed buildings. These examples do not by any means include all the duties of the ladder company, but they do illustrate two important points about ladder company work:

1. Ladder company work is required at most every working fire.
2. Ladder company operations either accompany or precede engine company operations.

Ladder company apparatus and equipment have been designed to permit ladder teams to function effectively and quickly in accomplishing the five fire fighting objectives. Same as for engine companies, these objectives are:

1. Searching for and Rescuing victims;
2. Protecting exposures (keeping the nearby properties from catching fire);
3. Confining the fire (keeping it from spreading throughout the building, minimizing damage and buying more time to rescue trapped victims);
4. Extinguishing the fire (putting out all traces of the fire); and
5. Overhauling the fire ground (a systematic look at the entire scene to make sure all fire is extinguished, the scene is safe and personnel can begin their investigation into the origin and possible cause of the fire).

Through thorough training and experience, ladder company personnel must acquire knowledge, skill and judgment in performing nine basic duties usually assigned to ladder companies. Colerain Fire & EMS ladder company duties are defined as:

1. Search and Rescue (both occupants or victims as well as injured or trapped firefighters);
2. Ventilation (cutting holes in the roof to release heat and smoke buying time for trapped victims and keeping a back-draft or fire-smoke explosion from occurring, and minimizing fire damage);
3. Laddering (to rescue trapped victims and get firefighters to the roof and upper floors);

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4. Forcible entry (gaining access and providing for escape or rescue by forcing doors and windows, removing bars, gates, etc.);
5. Checking for fire extension (by opening up walls, ceilings, attics and floors looking for hidden fire that can re-ignite the building);
6. Ladder-pipe operation (large bore, elevated master streams providing large water flows to protect adjoining properties or when "going defensive");
7. Utility control (shutting off the electricity, gas and water to prevent injury and or further property damage);
8. Salvage (protecting property as yet undamaged by fire, smoke or water by removal or covering with tarps, containing excess water or channeling it out of the building); and
9. Overhaul.

At some building fire incidents, it might be necessary for the ladder company to perform all of these operations; other fires might require only some of the duties. Just as situations vary, procedures for each situation will also vary. With the exception of rescue, the duties are not necessarily performed in the order given above; that, too, depends on the incident scenario. Rescue of victims is always the first priority, but sometimes that can best be accomplished by quickly putting a smaller fire out.

A combination of radio transmissions and statements (written and interview) are utilized to demonstrate L25's initial actions upon their arrival on the scene at 06:25:35. L25 positioned their apparatus behind E102 in the driveway, donned their SCBA and proceeded towards the front of the building. L25's OIC radioed to Command, "We do have a working fire" at 06:27:12. As L25's interior team arrived at the main-level front door, both team members observed an uncharged 1¾-inch hose line entering the building. Due to an unintelligible radio transmission between Command and Capt. Broxterman, L25's OIC radioed, "...Engine 102 is making entry into the basement" at 06:28:13. L25's OIC further advises Command at 06:28:26, "We have heavy smoke. You can definitely tell that its...in the structure itself. It is a basement fire". Looking towards the rear of the building from the exterior, front porch area, the L25 OIC made this observation using their assigned Thermal Imaging Camera, which provided an all white display on the monitor screen (a condition caused by aiming the camera at a very hot object or flame). At 06:28:40, Command assigned L25 (interior team) to search the interior of the building, which was acknowledged at 06:28:49 by it's OIC. At 06:29:05 L25 OIC radioed, "E102, they need some water". At this time based on written statements, L25 interior team goes to the rear of the building to evaluate conditions. L25's OIC requests PPV at 06:31:21. The L25 interior team then returns to the front of the building, according to written statements. Command radioed L25 OIC to inquire as to the number of personnel assigned to the company. L25 OIC responds, "We have a four-person crew. We

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need...positive pressure...as soon as possible. I don't know if E102 has heard they're to redeploy to the rear of the structure" at 06:31:41. At 06:31:58, Command radioed L25 OIC, "Are they in close proximity to you"? L25 OIC responded, "No, I have not made entry into...the structure at this time". Once PPV was started both of L25's teams (interior and exterior) returned to the rear of the building to assist with fire attack. At 06:38:24, L25 OIC returned to the front of the building to evaluate interior fire conditions from the exterior, front porch area for a second time, and radioed, "Be advised, thermal imaging camera is showing the upper steps to basement are completely blocked with fire. No sign of any injured crew in that area". At 06:38:59, L25 OIC radioed, "Be advised there is no way we can make entry. We're going to have to knock the fire down before we can make entry".

According to interview statements from L25 interior team,

L25 interior crew attempted to make contact with E102's crew, but was unable to contact them from the front porch (verbally) or verify their location with the TIC. L25 interior crew then proceeded to the rear of the structure to assess fire conditions. Upon returning to the front the crew did not make entry due to conditions.

It's likely that L25 interior team's decision not to enter the building was also a missed opportunity to lead the distressed firefighters of E102 out of the building.

According to interview statements from L25 exterior team,

L25 exterior crew proceeded towards the front of the structure with two (2) positive pressure ventilation fans (one from E102 and one from L25). They positioned the fans in the front doorway however did not start them until requested. After placing the fans, L25 exterior crew proceeded around to the rear of the structure and fell under the supervision of the Rear Sector Officer. At approximately 06:55:00 there were several calls on the radio for the gas to be shut off. L25 exterior crew radioed that the gas had already been shut off. L25 exterior crew remained in the rear of the structure for the remainder of operations.

It should be noted that there was no progress report from L25 exterior team to the IC that gas service had been terminated prior to the 06:55 radio transmission. However, a L25 exterior team interview statement indicated that the natural gas was shut-off shortly after the PPV was started.

The investigation committee concluded that personnel assigned to the ladder company were ineffective in performing search and rescue and utility control duties, finding that the personnel fell short in performing the assigned duties of the ladder company.

## FIREFIGHTING TACTICS AND OPERATIONS

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The committee also concluded that L25 exterior team's mistake in not controlling the natural gas supply to the building upon their initial arrival resulted in free-flowing fuel into the collapse area. Following the flooring system collapse, the free-flow of fuel likely intensified the fire in the collapse area by means of the open-end of the supply piping. In addition, PPV was not initiated in accordance with acceptable criteria for its safe and effective use. At 06:39:43, L25's exterior team radioed that they had set up PPV at the front door, and had started the fan. By initiating PPV at the time it was, the committee believed that the efforts to control this incident were negatively influenced in the following ways:

- Fire control efforts were in progress from the rear of building, thus ventilation was *not* being coordinated with fire attack. As a result, this provided for an opposing operation, whereas the air produced by the ventilation blower flowed in one direction and fire streams were being directed in the opposite direction.
- The location of the two believed downed firefighters was still unknown in the building, thus potentially placing the missing firefighters between the fire and the exhaust opening.
- The introduction of forced air into the building provided additional oxygen in areas with active fire that were not being controlled by fire streams, thus increasing the burn rate, which increased the heat release rate.
- Compartmentalization of the interior areas could not be achieved and ventilation openings were not controlled due to fire venting from *several* exterior openings on the first and basement levels. For PPV to be effective the integrity of the building must be intact and openings kept to a minimum.

**RECOMMENDATION #4.7a:** Fire department personnel responsible for controlling a building's utility services during an emergency incident must be thoroughly trained to rapidly identify types of utility service, points of entry, control mechanisms (e.g., switches, valves), and the proper function of control mechanisms (e.g., on and off positions).

Firefighters must have a good working knowledge of the utility services that serve a building. The utility services of a building often contribute to problems during firefighting operations. If these services are not controlled early in the incident, they have the potential to add fuel to the fire, contribute to extension, create additional damage, and cause extremely hazardous conditions. The ability to safely control an occupancy's gas, electricity, and water has pronounced effects on firefighter safety .

**RECOMMENDATION #4.7b:** Fire departments should ensure that incident commanders are provided periodic progress reports from firefighters and officers operating on the fire ground.

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Effective communications is critical on the fire ground. The IC cannot be everywhere and must rely on others to report the layout of the building, the fire conditions and to provide ongoing progress reports so that a strategic plan can be developed. Without this ongoing flow of information, it is difficult, if not impossible, to develop a plan that takes into account all of the critical factors that will assure a safe operation.

Progress reports should be provided by the first companies or Divisions assigned to a geographic area or Groups assigned to a function. As the incident continues, Division and Group supervisors should obtain critical information and forward progress reports to the IC on a regular basis, as progress is made; and when progress toward objectives cannot be achieved. A standardized format for progress reports is LCAN (Location, Conditions, Actions, and Needs).

Klaene and Sanders state that,

Frequent progress reports are essential to the IC, who should have a good overall view of the incident. Interior crews and crews working in areas not visible to the IC are the eyes and ears of the IC.

Progress reports also provide everyone on the fire ground with information on other aspects of the fire that relate to their own particular operations. (2008, p. 130)

**RECOMMENDATION #4.7c: Fire departments should ensure that firefighters understand the influence of positive pressure ventilation on fire behavior and can effectively apply ventilation tactics.**

Colerain Fire & EMS has utilized ventilation blowers or fans to pressurize buildings prior to suppressing fire incidents since the mid 1980's. This pressurization or PPV tactic has assisted in venting smoke and high temperature combustion products and making an attack on the fire easier than without PPV. However, this tactic can influence a fire incident by providing additional oxygen to the fire and increase the rate of heat and energy being released.

It is critical that fire fighters understand the influence of ventilation on fire behavior and the fire environment. Fundamentally, the implementation of PPV requires training and should not automatically be used, it must be stressed there are situations when the use of PPV will be inappropriate, counter productive or cannot be utilized. Effective tactical ventilation coordinated with fire attack can significantly reduce the potential for extreme fire behavior and increase tenability, but an emphasis on safety must prevail at all times when the decision to use PPV is made.

## FIREFIGHTING TACTICS AND OPERATIONS

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During this incident, positive pressure was applied at the front entry door with several uncontrolled exhaust openings on the first and basement levels. Control of an exhaust opening size and location is critical to the success of PPV and indiscriminate ventilation (e.g. random breaking of windows) should absolutely be avoided. In addition, fire companies were engaged in directing fire streams from the rear of the building at the time PPV was initiated. Fire streams should never be directed into an exhaust opening as this will seriously compromise PPV operations.

Additionally, it is important to manage the flow of air between the inlet and the exhaust opening. This may require closing windows and doors that are already open, personnel engaged in firefighting operations should have knowledge of the blower's position and the exhaust opening so as not to, disrupt the flow of air. The potentially negative consequences of randomly opening doors and windows in a building should be stressed during operations, therefore the need to co-ordinate the activities between fire attack and ventilation teams.

According to Battalion Chiefs Kriss Garcia & Reinhard Kauffmann of the Salt Lake City Fire Department,

When firefighters have entered the structure prior to the blower being used. Firefighters whose positions within the structure aren't known could be in for disastrous results if the blower is started. They may have moved to an area between the fire and exhaust opening, or they may have not yet made a large-enough exhaust opening. (Pressure Precepts, 2006, p. 40)

**FINDING #4.8:** The department had no comprehensive information regarding firefighting tactics in the format of Standard Operating Guidelines, especially specific to building fire incidents in below grade or basement areas.

**RECOMMENDATION #4.8:** Fire departments should develop and utilize Standard Operating Guidelines (SOG) that will direct fire department personnel before, during and after an incident to provide effective and consistent fire ground operations while ensuring firefighter safety.

At a minimum, NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program* and, NFPA 1561, *Standard on Fire Department Incident Management System*, should be utilized in developing SOGs that include, but is not limited to, use of an Incident Management System, Two-In, Two-Out Procedures and Rapid Intervention Teams.

According to NFPA 1500, Chapter 4.1.2, "The fire department shall prepare and maintain written policies and standard operating procedures that document the

## FIREFIGHTING TACTICS AND OPERATIONS

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organization structure, membership, roles and responsibilities, expected functions, and training requirements, including the following:

1. The types of standard evolutions that are expected to be performed and the evolutions that must be performed simultaneously or in sequence for different types of situations;
2. The minimum number of members who are required to perform each function or evolution and the manner in which the function is to be performed;
3. The number and types of apparatus and the number of personnel that will be dispatched to different types of incidents
4. The procedures that will be employed to initiate and manage operations at the scene of an emergency incident." (2002, p. 15)

According NFPA 1561, Chapter 4.4.5, "The (department) shall prepare and adopt written plans, based on the incident management system, to address the requirements of the different types of incidents that can be anticipated" (2008, p. 13).

**FINDING #4.9:** E26's OIC made an extremely difficult decision to leave the downed firefighters in place for scene preservation and investigational purposes. This decision was based on globally accepted practices and laws governing evidence preservation in fire situations.

Upon locating the first downed firefighter (Capt. Broxterman), and assessing surrounding conditions and location of the firefighter who's injuries did not appear compatible with life, E26 OIC made the extremely difficult decision to leave her body in place. He then returned outside of the building to conduct a face-to-face conversation with Car 2501 concerning leaving the deceased in the location and position found. After consideration of the deteriorating structural conditions above and surrounding the downed firefighter, the decision was made by Car 2501 to remove her body from the building. Following the removal of Capt. Broxterman, Ffr. Schira was then located in the debris in close proximity to Broxterman. Schira's injuries also did not appear compatible with life and was also removed from the building. Both deceased firefighters were subsequently moved to awaiting ambulances for officials to begin their investigation and then transported to the Hamilton County Coroner's Office for post-mortem examination.

One of the most difficult decisions a firefighter must make is whether to remove a victim from a fire during search and rescue operations. Firefighters train countless hours and practice numerous scenarios in regards to rescue and extrication of viable victims. However, when the victim exhibits obvious signs of death, a decision must be made on whether to remove the body or to leave it in place, thus preserving evidence for fire and law enforcement investigators and representatives from the coroner's office.

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The difficulty in making this decision is exponentially compounded when the fire victim becomes one of your own co-workers. The decision to instinctively react and to remove an obviously deceased firefighter is one that must be carefully considered. Leaving a downed co-worker in a fire situation such as in this case, is by all means, a terribly difficult decision to make. However, the decision to move the deceased may also impact the investigation by moving or displacing key evidence which may be essential in cases of suspicious fires or criminal actions.

Firefighters are instructed in fundamentals of fire investigation procedures as part of their basic firefighting training. From their early days on the job, firefighters should be aware of their role in the investigation process. “Firefighters must be aware during fireground operations that what they do and how they do it can affect the determination of the origin and cause of the fire” (Goodson & Murnane, 2008, p. 910) Therefore it is extremely important for firefighters to take precautions during their operations to protect and preserve evidence on the fire scene.

This evidence preservation also extends to considering protecting victims in the location and position in which they are found. As John J. O’Connor emphasizes in *Practical Fire and Arson Investigation*, with few exceptions, “...line firefighters and other emergency personnel should be prevented from moving a dead human body found in the charred debris” (1987, p. 149). Many texts and resources do not differentiate deceased firefighters from deceased civilians. Therefore, while an extremely emotional issue, firefighters should be prepared to make the difficult decision if certain circumstances present themselves.

In 2002, the Hamilton County Coroner’s Office presented guidelines to area fire departments for preservation of evidence in regards to obvious fire fatalities, and in what situations to call the coroner’s officer when dealing with specific types of fatal incidents, such as fire incidents. The Coroner’s guidelines are a direct reflection of laws governing death investigations and evidence preservation. The above guidelines were adopted into a comprehensive Standard Operating Guideline by Colerain Fire & EMS in 2003. In short, the guidelines indicate that in the event of a fire fatality...

- If there are no signs of life or viability, leave the body in the position and location in which it was found;
- In the event that a body must be moved due to operations or to prevent further damage to the body, only move it as far as is necessary;
- If the body must be removed from the building, only move it as far as necessary so that it can be examined as close to the incident as possible; and
- If possible, and the opportunity presents itself, considerations should be given to taking photographs of fire victims in the location and position found prior to

## **FIREFIGHTING TACTICS AND OPERATIONS**

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moving. This evidence should be immediately turned over to law enforcement investigators in an effort to preserve the chain of custody.

At the Squirrelsnest LN incident, the decision by E26 OIC to leave the bodies in place for investigational purposes was not an easy one to make. This officer has over 20 years of experience in both firefighting and also as a fire scene investigator. He decided to preserve evidence in place and to discuss his findings with Car 2501. As the fire continued to burn and threatened further damage to both deceased firefighters, the decision was made to remove them in accordance with the aforementioned guidelines.

All teams involved in the search and subsequent extrication of both Captain Broxterman and Ffr. Schira should be commended for having the situational awareness and state of mind to consider scene preservation. It is recognized that even the initial decision to leave a fellow co-worker inside a burning building may be met with some resistance and cause some consternation. However, considering the legal implications and unknowns surrounding the fire origin and cause at the time of victim discovery, it is imperative that these tough decisions at least be considered.

# FIREFIGHTING TACTICS AND OPERATIONS

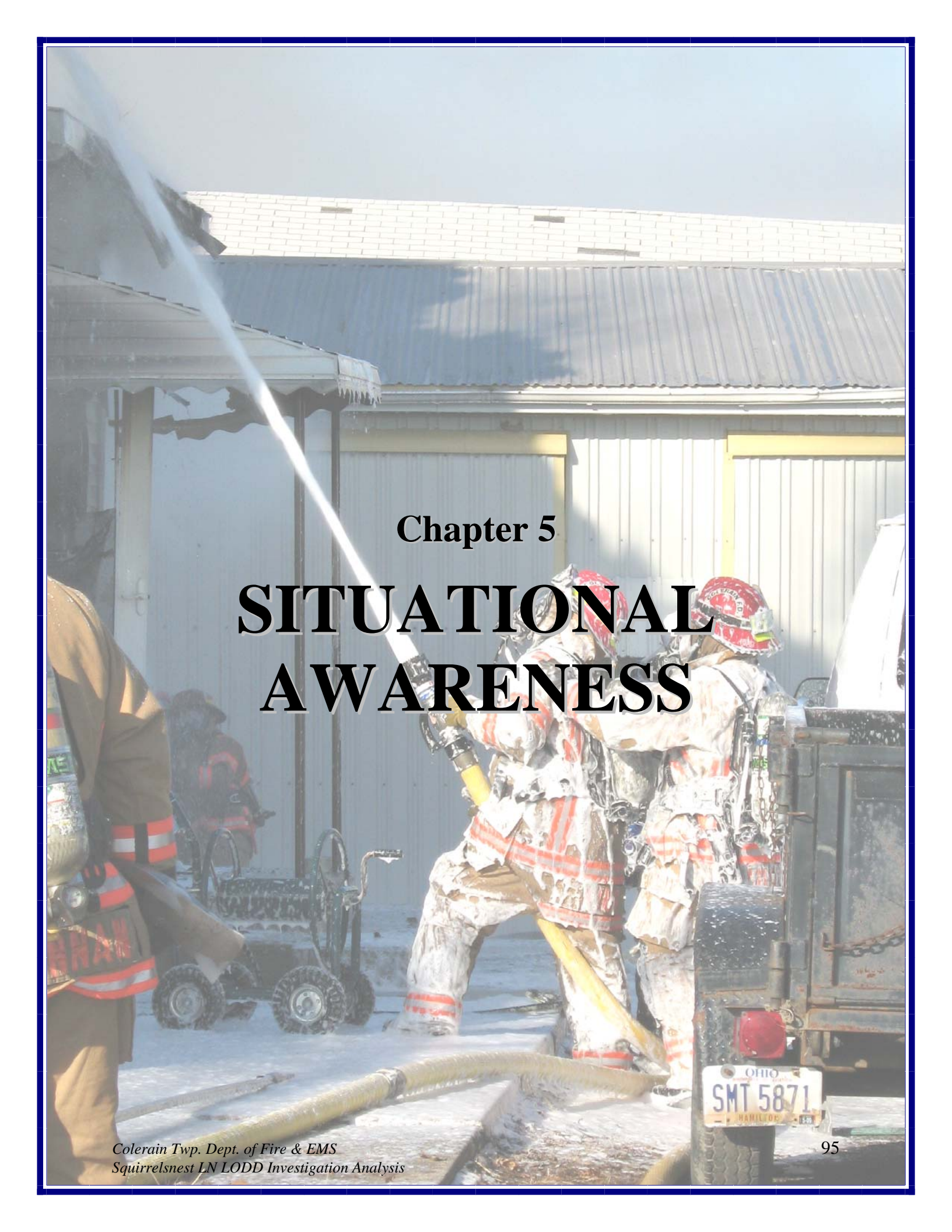
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## **FIREFIGHTING TACTICS AND OPERATIONS**

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A photograph of firefighters in full protective gear, including helmets and bunker coats, using a high-pressure water hose to spray a building. The scene is outdoors, with a building featuring a white roof and blue siding in the background. The firefighters are positioned in the foreground, with one firefighter on the left and two others in the center. A fire truck is partially visible on the right side of the image. The text "Chapter 5" and "SITUATIONAL AWARENESS" is overlaid on the image.

## Chapter 5

# SITUATIONAL AWARENESS



# SITUATIONAL AWARENESS

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## Overview

The concept of situational awareness has been known to military leaders since the 6<sup>th</sup> century BC as discussed in Sun Tzu's *The Art of War*. Over the centuries, the idea of *knowing your surroundings* has been referred to by several terms, but it wasn't until World War I fighter pilots used the term *situational awareness* to describe the state of consciousness and understanding required for successful pilots to engage in air to air combat missions.

Situational Awareness (SA) involves the observation of one's dynamic environment, understanding personal abilities and limitations and anticipating how their decisions and actions may impact the environment in which he or she is interacting. Simply stated, SA is: "knowing what is going on so you can figure out what to do" (Adam, 1993, p. 318). SA has been identified as a critical but sometimes elusive basis for successful decision-making spanning various complex and ever-changing environments including military and emergency operations. As the concept of SA has developed, it has also found a following in the fire service. Several articles on the subject may be found in professional trade publications and other media alike concerning the topic.

As it relates to the fire service, there are several components of SA that must be acknowledged before one can actively participate in firefighting operations. SA can be applied to individuals or teams, with one concept building upon the other. An individual's SA is a product of training, experience, and abilities. Only after repeated exposure to emergency operations, training on the subjects and a continuous process of learning from past actions can an individual begin to enhance or develop their own SA.

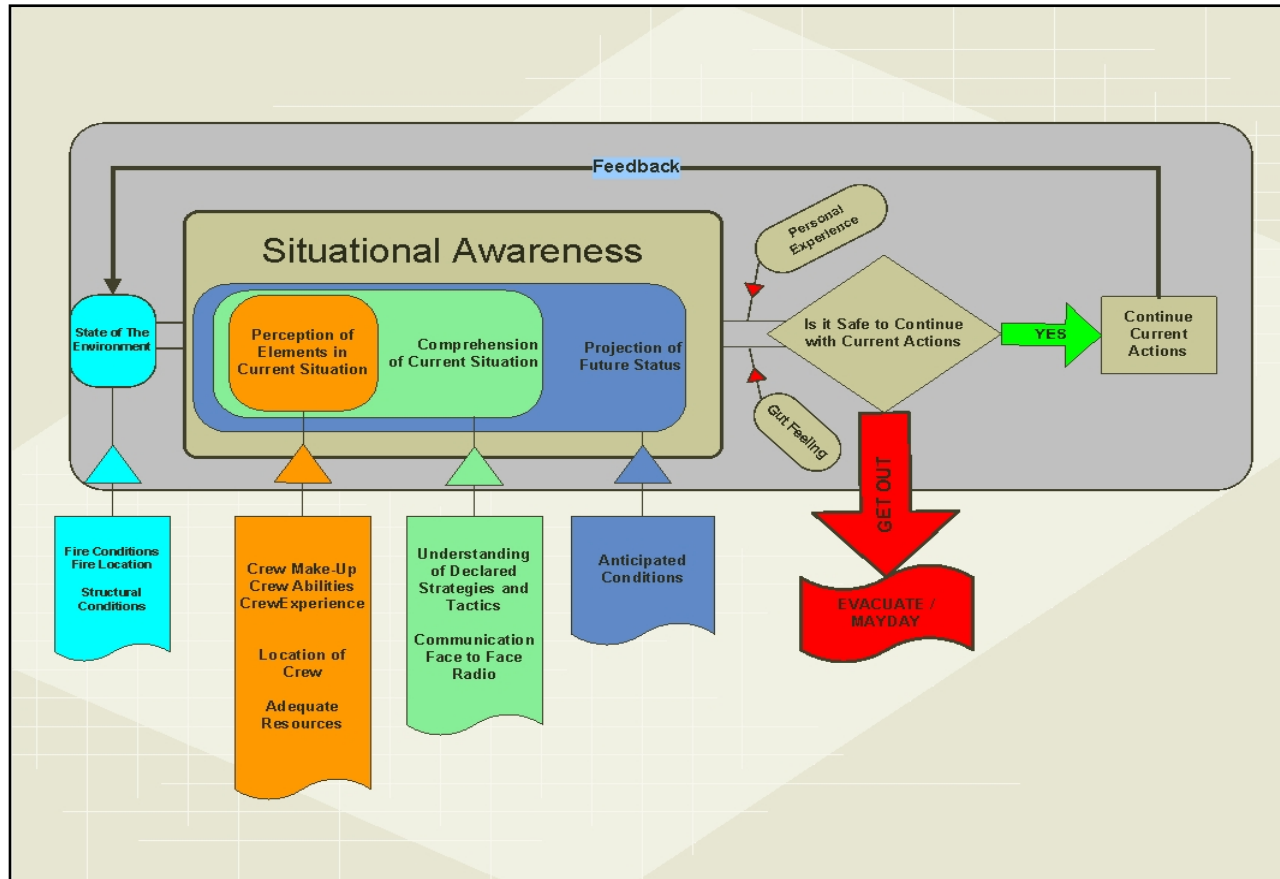
On the other hand, the concept of team SA is a product of combined individual SA. Team SA can be defined as "the degree to which every team member possesses the SA required for his or her responsibilities" (Endsley, 1995, p.39). While each team member may have their own awareness of their individual tasks and duties, it is the collective utilization of the group's SA and understanding of critical information that enables the team to work effectively. Information exchange between members of the team is critical for successful operations.

Poor SA or lack thereof has been cited as primary factors in countless incidents such as aviation and other transportation disasters. Poor individual SA can lead to poor performance and the inability to assimilate critical information, therefore resulting in tragedy. In the fire service, situational awareness can be negatively affected by fixation or "tunnel vision". Becoming fixated on one piece of the puzzle makes it impossible to understand other pieces affecting the situation. (Okray, & Lubnau II, 2004, pp.69-71)

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Based on Endsley's work in the 1990's, the following model (Figure 34) was adapted to reflect decision-making processes leading to situational awareness for the structural firefighter.

Figure 34: Endsley's model of situational awareness (1995) adapted to structural firefighting by Conn 2009.



During the Squirrelsnest incident, firefighting operations were influenced both positively and negatively by individual and team situational awareness. All levels of operations were impacted by this concept.

### Findings, Discussions and Recommendations

**FINDING #5.1:** The Incident Commander's situational awareness contributed directly to the quick identification of potential problems on the fire ground. His repeated unanswered calls for an update from E102's team and other teams that may have come into contact with E102 led him to recognize a critical situation and subsequent activation of the RAT.

The IC must maintain an awareness of current fire conditions, potential changing conditions and team assignments at all times. After his arrival on scene, the IC received a

## SITUATIONAL AWARENESS

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timely update and subsequently prepared to take command of a declared offensive fire operation. During the initial phases of operations, information was relayed to the IC concerning fire conditions and building construction from the rear of the residence. With this additional information and advice from other company officers, the IC attempted to contact E102's attack team. After several unsuccessful attempts to contact the interior team, the IC declared the mayday and set in motion a series of events including RAT and continued firefighting operations.

The ability for the IC to maintain the situational awareness among a hectic and stressful situation is paramount. Regular routine operational exposure to managing incident command and periodic training on command procedures and firefighting tactics proved beneficial. Whereas the outcome of the Mayday was tragic, the ability of the IC to maintain composure and situational awareness led to an earlier identification of missing teams before it had been declared on the radio.

**RECOMMENDATION #5.1a:** Fire departments should ensure that continued Incident Command System training in the department's Command Simulator is completed by all incident commanders and company officers on a regular basis.

**RECOMMENDATION #5.1b:** Fire departments should provide regular and routine operational command exposure to those individuals designated as incident commanders and company officers for the continued development of their Command Situational Awareness.

One particular aspect of SA that sets the stage for successful emergency operations is the scene size-up. A comprehensive and effective scene size-up is critical for the initial on-scene officer and for those responding to obtain a clear picture of the incident scene and mentally prepare for the declared operational strategies and tactics. An incomplete or inaccurate scene size-up withholds valuable information that could potentially affect the lives and safety of those responding. A keen situational awareness is crucial to performing the effective scene size-up.

**FINDING #5.2:** E102 Team advanced an uncharged attack line into the building with obvious signs of a working fire.

Witness narratives make many statements concerning the apparent advancement of a dry hose line into the building. There are repeated calls over the radio for the hose line to be charged. The overwhelming anecdotal evidence indicates that the interior attack team made an initial entry through the front door with an uncharged hose line. The location of the interior attack team from E102 at the time they received an adequately charged hose line is unknown.

## SITUATIONAL AWARENESS

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SA on the part of firefighters, fire teams and apparatus operators is extremely critical in the initial phases of interior firefighting. There are relatively few acceptable occasions to advance a dry hose line into a building such as advancing to a known fire on floors above the entry point. This decision is based on smoke and fire conditions, building construction and other observed environmental situations.

**RECOMMENDATION #5.2a:** Fire departments should promote regular and consistent team assignments to form and ensure high performance teams.

**RECOMMENDATION #5.2b:** Fire departments should encourage team building exercises and trainings (e.g., fire attack, hose line advancement).

**FINDING #5.3:** E102's Ffr. #2 did not correlate the rapidly changing environment with events on the fire ground to determine the location of remaining members of his interior team.

Upon E102 Ffr. #2's realization of missing team members, an immediate Mayday should have been declared over the radio rather than making multiple unaccompanied attempts to locate the team by other means.

It appears that SA can be taught and reinforced, however not through typical educational endeavors. Reviewed literature suggests that SA can be learned through repeated exposure to situations requiring decisions. These critical decision making skills can be further enhanced if the result of the decision actually had an adverse outcome.

At the time of the Squirrelsneast Incident, E102's Ffr. #2 had limited experience as a part-time firefighter and had seen relatively few significant building fires. While his training records suggest that he was up to date on his departmental required trainings, his experience level would be considered rookie-level.

It is imperative to combine newer firefighters with trained and experienced firefighters or officers for fire ground operations. The Colerain Fire & EMS Training Division provides all Colerain Fire & EMS recruits with the core fundamental skills to become a firefighter and the firefighters on the scene of this Incident are no exception. However, in terms of SA, firefighters can only develop and enhance their own SA through repeated exposures to various situations. This can only come with experience. Therefore, while our firefighters are well-trained from the beginning, it is clear in this incident that the development of SA was in the early developmental stages of some responders.

E102 Ffr. #2 made entry with Capt. Broxterman and Ffr. Schira. As they advanced towards the basement, E102 Ffr. #2 reversed his travels to assist with

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advancing more hoseline to the attack team. After waiting for a period of time (which is described as “about a minute”) he re-entered the building alone to re-join his team. When he was unable to locate his team members, he once again returned outside and approached E25 OIC to advise him that he had lost contact with his team. At 06:29:24 Ffr. #2 makes a radio transmission requesting water. At 06:34:48 Ffr. #2 is reported to be outside the building advising E25 OIC he has lost contact with his team. Five and one-half minutes elapsed from the time Ffr. #2 was inside with his team, he advanced more hose line, re-entered the building to re-join his team and evacuated to the front-yard before there was confirmation over the radio of a missing team.

At no time did Ffr. #2 initiate Mayday procedures or declare a Mayday over his radio. Although by his own admission, he “knew something was wrong” he did not immediately recognize the gravity of the situation enough to take that extra step and declare the Mayday. “You need to initiate the process as soon as you *think* you are in trouble, not when you are absolutely *sure* you are in grave danger.” (International Association of Fire Chiefs [IAFC] and NFPA, 2008) Keenly developed SA allows an individual to process the information and to immediately recognize imminent danger and to take corrective actions. (Endlsey, 2000, p.317)

All personnel working on scene of a building fire are provided radios in which to communicate with command officers. As part of normal communications, company officers are typically providing the only radio traffic. However, in emergent situations such as significant safety events or a breakdown in team integrity, it is imperative that all personnel are comfortable with using the radio to call for Emergency Traffic or Mayday, or to utilize the emergency activation button located on the top of the radio. All personnel must have the SA to identify the significant event and to utilize the radios for their intended use.

**RECOMMENDATION #5.3: Fire departments must train command and firefighting personnel on procedures that involve a Mayday situation and also on the proper actions to be taken following the receipt of a Mayday.**

Since fire incidents are dynamic events and can change drastically at any given time, it is imperative that firefighters be prepared for critical situations should they occur. The best defense against getting into a dangerous situation is to not take unnecessary chances by weighing the risk of an action against the potential and realistic benefit one expects to gain. For example, if a room is fully involved, it is unlikely that an occupant could survive and searching should wait until conditions can be improved by use of ventilation and application of suppression streams.

Firefighters must be aware however that no matter how cautious they are, conditions can deteriorate rapidly and they can become lost or trapped. With this in

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mind, fire departments need to train firefighters to deal with situations such as these. Through repetitive training, firefighters can learn such emergency survival techniques as “skip-breathing” to conserve precious air supply, entrapment self-extrication techniques, wall breaching techniques, ladder escape “bail-out” methods and so forth. It is also important that firefighters be equipped with small items such as wire cutters, personal flashlights and personal lengths of rope or nylon webbing. In addition, firefighters must be trained that if they become lost or trapped the most important thing they can do is notify others of their situation and their approximate location.

Firefighters must be taught that if they become lost or trapped the most important thing they can do is notify others of their situation and their approximate location. For this reason, every interior team should be equipped with a portable radio equipped with a sufficient number of frequencies for fire ground operations as well as a dedicated command frequency. Utilizing their radio, they need to notify the IC of their situation using a pre-determined emergency term such as *Mayday*, or at the very least, firefighters should be comfortable with pushing the emergency activation button on top of the radio. Additionally, firefighters need to immediately activate their PASS devices manually so as to help rescue teams locate them quickly.

A way of assisting interior teams prior to any emergency (e.g., lost or separated from team, over run by fire conditions, etc.) is the routine raising of ground ladders, one on each side of the building if possible, in order to provide multiple means of emergency egress.

Above all, firefighters must be conditioned to respond to personal emergencies calmly in order to make reasoned decisions. Many times panic takes over and firefighters do things such as removing their masks that hastens their death. It is difficult to simulate a training scenario where a firefighter actually feels his or her life is threatened but creative, realistic and safe training exercises can be developed to help prepare firefighters for dire situations.

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## Chapter 6

# INCIDENT MANAGEMENT



# INCIDENT MANAGEMENT

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## Overview

The approach to emergency incident scene management by Colerain Fire & EMS is the Incident Command System. The Incident Command System (ICS) is a standardized, on-scene, all-hazard incident management concept. It consists of a standard management hierarchy and procedures for managing temporary incidents of any size. The ICS is a management protocol originally designed for emergency management agencies in the United States which was later federalized. The ICS is based upon a flexible, scalable response organization providing a common framework within which emergency responders can work together effectively and efficiently. Emergency responders may be drawn from multiple agencies that do not routinely work together, and the ICS is designed to give standard response and operation procedures to reduce the problems and potential for miscommunication on such incidents. The ICS can be summarized as a *first-on-scene* organizational structure, where the first arriving responder at the scene has charge of the incident until it has been declared resolved, a superior-ranking responder arrives on scene and assumes command, or the IC relinquishes command to another individual IC.

The Incident Command System used by Colerain Fire & EMS was adopted by Colerain Fire & EMS in middle 1980's. It is the standard by which the department operates at all incidents in order to effectively manage personnel and resources, and to provide for the safety and welfare of personnel. The Shift Commander (Battalion Fire Chief) is responsible for coordinating the daily operations of on-duty fire suppression personnel, apparatus and equipment; responsible for acting as the on-scene IC of responses to fire, rescue and emergency medical incidents. The Shift Commander is dispatched according to the dispatch complements, but may elect to respond to any emergency incident that occurs within Colerain Fire & EMS response area.

## Command Responsibility

The IC is responsible for the completion of the tactical objectives. The tactical objectives listed in order of priority are:

- Provide for life safety;
- Incident stabilization; and
- Property conservation.

## Modes of Operation

There are two modes of operation on any emergency incident scene, *offensive* and *defensive*. This terminology helps to identify the methodology of the IC in attempting to stabilize the incident.

## INCIDENT MANAGEMENT

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- Offensive Mode - Interior attack and related support directed toward the rapid control and extinguishment of fire.
- Defensive Mode - Exterior attack directed to reduce the amount of fire extension from an area or building, and then bring the fire under control with ultimate extinguishment.

Command must define if the operation will be offensive or defensive in nature so that all companies will be aware of the intent of the operation.

The change in mode can come quickly or an incident may start out in the defensive mode and switch to the offensive mode based upon fire ground conditions presented. Most building fires will begin in the offensive mode. Interior attack efforts are directed towards supporting a primary search for fire victims. The initial attack must go between victims and protect the avenues of escape.

### Functions of Command

The functions of Command include:

- Assume and announce Command and establish an effective operating position (Command Post).
- Rapidly evaluate the situation (size up).
- Initiate, maintain and control the communication process.
- Identify the overall strategy, develop an incident management plan, and assign companies and personnel consistent with plans and standard operating procedures or guidelines.
- Develop an effective Incident Command organization.
- Review, evaluate, and revise (as needed) the incident management plan.
- Provide for the continuity, transfer and termination of Command.
- As Command is transferred, so is the responsibility for these functions. The first five functions must be addressed immediately from the initial assumption of Command.

### Establishment of Command

The first fire department member or unit to arrive at the scene shall establish command of the incident. The initial IC shall remain in Command until Command is transferred or the incident is stabilized and Command is terminated.

The first arriving fire department unit initiates the command process by giving an

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initial radio report. The radio report shall include:

- designation of the unit arriving on the scene;
- a brief description of the incident situation (e.g., building size, occupancy, etc.);
- obvious conditions – working fire, smoke showing, multiple patients;
- brief description of action taken;
- declaration of strategy (offensive or defensive);
- any obvious safety concerns;
- establish and identification of Command; and
- establish and announce accountability location.

### Command Options

The responsibility of the first arriving company or member to establish Command of the incident presents several options, depending on the situation. If a chief officer, member, or unit without tactical capabilities (e.g., staff vehicle, no equipment, etc.) establishes Command, the establishment of a Command Post should be a top priority. At most incidents the initial IC will be the company officer. The following Command options define the company officer's direct involvement in tactical activities and the modes of Command that may be utilized.

- *Nothing Showing (Investigation Mode)* - These situations generally require investigation by the initial arriving company while other units remain in staging.
- *Fast Attack (Mobile Command Mode)* - These situations require immediate action to stabilize the incident and requires the IC's assistance and direct involvement in the attack. In these situations the IC goes with the crew to provide the appropriate level of supervision. Where fast intervention is critical, utilization of the portable radio will permit the IC's involvement in the attack without neglecting command responsibilities. The Fast Attack Command Mode should not last more than a few minutes and will end with one of the following:
  - Situation is stabilized;
  - Situation is not stabilized and the IC must withdraw to the exterior and establish a Command Post; and
  - Command is transferred.

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- *Command Mode (Stationary Command Post)* - Certain incidents, by virtue of their size, complexity or potential for rapid expansion, require immediate strong, direct, overall Command. In such cases, the IC will initially assume an exterior safe and effective command position and maintain that position until relieved.

### Command Structure

It is the responsibility of the IC to develop an organizational structure, using standard operating procedures, to effectively manage the incident scene. The development of the organizational structure begins with deployment of the first arriving fire department unit and continues through a number of phases, depending on the size and complexity of the incident.

The Command organization must develop at a pace, which stays ahead of the tactical deployment of personnel and resources. In order for the IC to manage the incident, he or she must first be able to direct, control, and track the position and function of all operating companies or teams. Building a command organization is the best support mechanism the IC can utilize to achieve the harmonious balance between managing personnel and incident needs. Simply put, this means large incidents need big command organizations and small incidents need simple command organization. The IC should have more people working than commanding.

### **Findings, Discussions and Recommendations**

**FINDING #6.1:** E102's officer was in charge of the incident initially, but did not initiate the command process according to department guidelines by means of the initial radio report.

During this incident E102's officer radioed on scene at 06:24:01 and provided the following report: "E102 on the scene, moderate smoke showing. E102 will be Squirrelsnest Command." No further information was provided to other responding companies. Based on information transmitted by means of the radio, it was *assumed* that the incident was an *offensive* fire and E102's officer had chosen the *Fast Attack Mode*. This on-scene radio report was not consistent with Colerain Fire & EMS *General Operating Guidelines, Section 4* addressing the establishment of command. According to the guideline,

- 4.5. On incidents where multiple units are dispatched, the ranking member of the first unit to arrive MUST establish Command and begin to develop an Incident Command structure by giving an initial radio report, as follows:

- A. Unit designation

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- B. A brief description of the incident situation.
  - Building description.
  - Description of the incident conditions.
- C. Declaration of basic strategy (Offensive or Defensive).
- D. Any obvious safety concerns.
- E. Assumption, identification, and location of Command.
- F. Request of additional resources, or release of resources.
- G. Assignment of other responding resources as required.

This brief initial report allows other arriving units to be better prepared to take action on arrival. It also allows other unit commanders and chief officers to pre-think the usual tactics that may be required of their units for this specific situation.

**RECOMMENDATION #6.1:** Fire departments should make every effort to clearly communicate all incident command decisions that can directly affect the safety of those en-route and operating on an incident scene relative to the on-scene radio report. These decisions may include: who is establishing Incident Command, mode of fire attack, declared strategy, etc.

The first arriving fire officer at an incident scene should give a good initial on-scene radio arrival report. He or she must paint a good picture for the other responding units so they have an idea of what one has and what one might have to do to support already initiated actions when they arrive. According to Anthony Avillo,

The Primary Size-up Report is used to establish command and start the process of information evaluation. It also gives vital information and possibly direction to the incoming companies. It aids these companies in creating their own mental picture of the incident before they arrive on-scene, and allows them to begin their own scene size-up with more information, courtesy of the IC. (Fireground Strategies, 2008, p. 27)

To be effective, the initial on-scene report needs to be clear, concise and relevant. Relevant information in this case would be information directly related to initial operations. The initial on-scene radio report should sound something like this:

Engine 99 is on-scene. We have a two-story wood frame residential building with moderate smoke and fire showing from the second floor, Alpha - Beta corner. This is an offensive fire. Engine 99 is establishing Pleasant Avenue Command.

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**FINDING #6.2a:** During the initial stages of the incident the incident commander (D25) was operating with very limited command support in which to manage fire ground operations.

At this incident, there were two command officers present during the initial stages of the incident to manage fire ground operations. This was primarily due to the fact that the incident was dispatched as a fire alarm activation, which only required the response of the shift commander per the department's response protocol. This resulted in the delayed ability to immediately staff key positions of the department's incident management system with command support officers.

D25 formally assumed command at 06:26:35, two and one half minutes after E102's officer radioed on the scene, relieving E102's officer of command responsibility. At 06:27:08, the IC, requested a staff notification be dispatched to advise command and staff officers of the working fire scenario and the need for command support personnel. Car 2508 (Training Division Chief) was monitoring the incident while commuting to work early to do his physical fitness routine radioed on-scene at 06:27:41. Through face-to-face communications with the IC, he was subsequently assigned as the rear sector officer. Eventually, additional command and staff officers began arriving at approximately 06:40:00. At 06:41:53, a request was radioed to the HCCC by the IC for a second staff notification be dispatched with an emphasis placed on *Mayday Operation*.

**FINDING #6.2b:** There was a concerted effort exhibited by the incident commander to track and locate E102's interior team when his situational awareness indicated that he had a possible missing firefighting team..

When the incident commander recognized that he'd not heard any radio transmissions from E102's interior team and was unable to make radio contact with them, he immediately initiated actions to locate the team. There were at least *eight* attempts from 06:30:55 to 06:37:33 to contact and locate E102's interior team by the IC. These attempts were accomplished by means of radio to radio contact and also through the observations of on-scene company officers and the rear sector officer. During the aforementioned period of time, the IC recognized the ever so possibility that he had a missing firefighting team and demonstrated diligence in his attempts to verify their wellness. In addition, he began taking steps in preparing to activate the RAT for firefighter search and rescue efforts at 06:34:10, "E25.... Get set-up. I have not hear from Interior One". The RAT was activated at 06:36:48. The Mayday was declared by the IC at 06:37:41.

**FINDING #6.2c:** There was a *potential* for the incident commander to become rapidly overwhelmed and overloaded as the events on the fire ground and conditions deteriorated.

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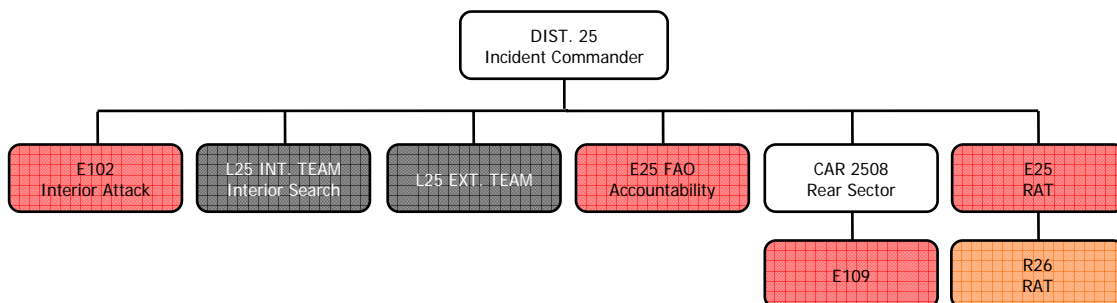
A chief concern raised during the investigation process of this incident was the potential for the IC to rapidly become overwhelmed as the events on the fire ground and conditions deteriorated simultaneously with the processing of information, especially when it was recognized that firefighters were possibly lost or trapped.

Within approximately 13 minutes of arrival on scene the IC was responsible for the following:

- Directing and controlling fire ground operations;
- Filling out and updating the tactical worksheet;
- Monitoring radio transmissions (primary dispatch channel and the fire ground talk-group);
- Requesting additional resources (e.g., staff notification, second alarm complement, etc.);
- Managing the MAYDAY;
- Managing the transition of firefighting companies and teams not involved in the MAYDAY to a separate talk group;
- Activating the RAT;
- Maintaining fire ground accountability;
- Managing fire ground span of control; and
- Multiple telephone calls to and from the HCCC.

Despite the potential for overload, the IC *remained alert, kept calm, thought clearly and acted decisively*. The immediate need of the IC at this point in the incident, was support.

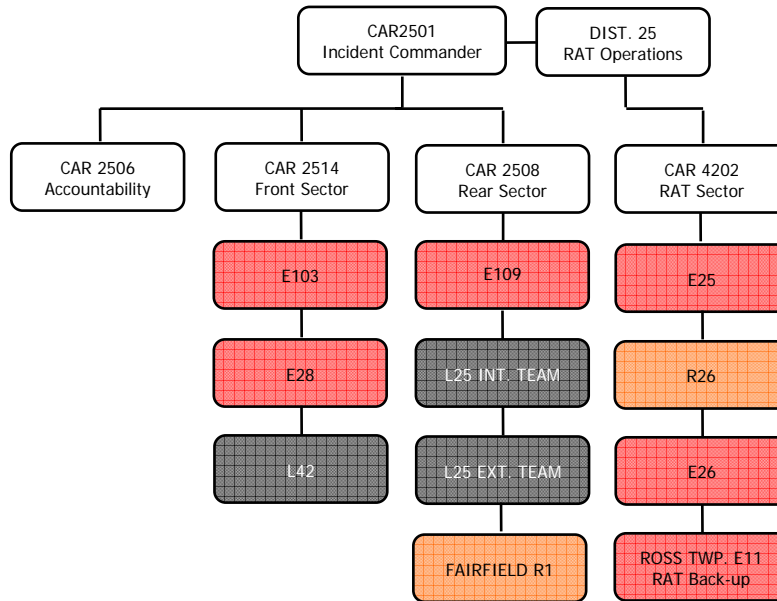
*Figure 35: Incident Organization Structure from approximately 06:26 hrs. to 06:40 hrs..*



At 06:40 hrs., the fire chief arrived on the scene and reported to the command post to serve simultaneously as a senior advisor and support officer. In this capacity, his role was to enhance the Command process and make the functions of Command more effective.

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Figure 36: Incident Organization Structure from approximately 06:41 hrs. to 07:25 hrs.



**RECOMMENDATION #6.2:** Fire departments should ensure that adequate numbers of command support staff are available to immediately respond to emergency incidents to support positions with their incident management system.

As complex incidents escalate into and past the requirements of a first alarm assignment, the IC can become overloaded and overwhelmed, as previously identified with information management, assigning companies, planning, forecasting, calling for additional resources, talking on the radio, and fulfilling all the other functions of command. During complex incidents or when an incident takes a turn for the worst, several command support personnel are needed immediately to appropriately put into practice a fire department's incident management system.

The U.S. Fire Administration addressed the negative impact on using company officers in command support positions during firefighting operations in its technical report, *The Aftermath of Firefighter Fatality Incidents*. The report stated,

Using company officers to perform command tasks or fill command positions in the IMS increases the risk for firefighters as their officers' attention is directed away from the tactical tasks at hand. Incidents requiring multiple command officers, by their inherently serious nature, also require that company officers remain with their firefighters and give their full and undivided attention to safely performing tactical operations. (Thiel, 1998, pp.17-18)

The early of arrival of command support staff facilitates the establishment of divisions, groups or sectors, which allows the command structure of an incident to grow

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more effectively than simply deploying resources and assigning division, group or sector supervisors after units are in place. This makes the management of an incident more feasible by allowing company officers to remain with their teams and relieving the IC of aforementioned responsibilities which allows the IC to focus on the bigger picture while still maintaining the ability to react to progress reports and other information provided by supervisors.

To provide a sufficient number of command support staff, the use of an Incident Management Assistance Team (IMAT) is recommended for the purpose of completing and enhancing the incident management system at the local response level. Members of a team can be command officers employed from mutual-aid fire departments or local response agencies. An IMAT would provide support to the IC during the implementation of the incident management system and specifically in the development, implementation, and evaluation of the Incident Action Plan (IAP). An IAP is an oral or written plan containing general objectives reflecting the overall strategy for managing an incident.

**FINDING #6.3:** The initial location of the command post did not provide a tactically advantageous view for the Incident Commander where the overall incident could clearly be monitored.

At this incident, a stationary command post was established in the driveway behind L25's apparatus. The standard command post position for a Colerain Fire & EMS IC is a stationary one inside of a vehicle. National experience reflects that a strategic level of command can only be produced if the IC is in a stationary command post position.

*Figure 37: An approximate view of the fire building from the front of the vehicle used as the incident command post.*



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At 06:28:20, the IC radioed, "I'm a little bit away from the building. Can you give me the conditions as you have them now?" Due to distance, fire apparatus placement and smoke conditions, the IC's views of the building were obscured (Figure 37).

Colerain Fire & EMS ICs typically situate the command vehicle in an isolated location that affords the IC with a good view of the fire-building and surrounding area. When possible, it is in front of the fire building and does not interfere with apparatus movement. Preferably, the most advantageous view is of the front and most critical side of the incident. Colerain Fire & EMS has recognized the advantages of the stationary command post in the command vehicle as: a) a relatively quiet place in which to listen, think and make decisions, b) improved lighting during night operations, c) a place to write and record information, d) provide protection from weather, e) space for additional staff, and f) access to more powerful mobile radios, reference and pre-planning materials, and portable computers.

**RECOMMENDATION #6.3:** Fire departments should ensure that incident commanders are situated in a command post that is located in or tied to a vehicle to establish presence and visibility.

Commanding an incident from a stationary command post places the IC in a position where the incident can be managed on a strategic level. According to Klaene and Sanders, "There is a distinct advantage in being able to see the effects of tactical decisions..." (2008, p. 216). However, there may be scenarios such as this incident in which the IC may not always have a clear view of the incident scene. During these situations, it is imperative that company officers, division, group and sector supervisors act as the eyes for the IC and provide him or her with *concise specific information* and regular progress reports in order to make informed strategic and tactical decisions. In reality, the IC will always be dependent on firefighters, company officers and supervisors to provide information regarding changing conditions and the progress of firefighting teams, and report them to the command post. The Phoenix, Arizona Fire Department developed the simple acronym "CAN" following the line of duty death of Firefighter Brett Tarver that firefighters can use to provide progress reports. CAN is defined as:

**CONDITIONS:** "Command from Rear Division, reporting heavy fire extending from the second to third the floor ...."

**ACTIONS:** "Engine 1 is attacking the fire on the second-floor."

**NEEDS:** "We need an attack line on the third floor".

This flow of information to the IC is critical in the continuous size-up and evaluation of an incident. Progress reports also provide everyone on the fire ground with information on aspects of the incident that relate to their activities (primary and secondary searches, fire control, etc.).

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**FINDING # 6.4:** Due to the incident commander's composure, self-control and self-discipline he was able to effectively manage the initial Mayday operations as well as the firefighting operations.

During this incident, the IC solely recognized that the personnel assigned to E102's interior team were potentially missing or trapped and considered declaring a Mayday situation after several attempts to contact the team with no response and by means of communication with other fire companies to ascertain the whereabouts of E102's team. This early recognition began the process of managing the Mayday.

Historically, Colerain Fire & EMS's Mayday instructional methodology was based on the distressed firefighter initiating the Mayday. During its development there was no consideration given to a scenario in which the IC would initiate the Mayday based on his or her situational awareness.

As with any good firefighting operation, the success of a firefighter rescue operation is reliant on a definite action plan. The IC's response to the situation was the following:

- Revised the IAP to an urgent firefighter rescue effort.
  - The IC restructured the IAP to support locating the missing firefighters as well as maintaining effective fire suppression efforts.
- Immediately requested additional resources to support rescue and reinforce firefighting efforts.
  - Based on the circumstances a second alarm was immediately requested, which brought additional fire and emergency medical units to the scene. In addition, a *second* staff notification was requested with an emphasis placed on the Mayday situation.
- Initiated a change in radio talk-group assignments.
  - Once the Mayday declaration was announced, all companies and teams involved in fire suppression efforts were transitioned to a separate radio talk-group (Channel 11). The RAT teams and rescue support personnel remained on the initial talk-group (Channel 2) to minimize confusion or potential irrelevant actions by those involved in fire suppression. Once additional command support personnel arrived on-scene this talk-group was monitored at the command post.
- Assigned a RAT sector supervisor.
  - A mutual-aid department assistant fire chief that arrived on the second alarm was assigned to direct the overall RAT effort and coordinate information with the IC.

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***FINDING #6.5:*** No incident Safety Officer was appointed by the Incident Commander.

Due to limited command staffing, time and the load of responsibilities there was no dedicated safety officer appointed by the IC during the initial stages of this incident to observe operations and cease potentially unsafe actions. Therefore, in accordance with Colerain Fire & EMS incident management guidelines, *Section 3* addressing command functions, the IC provided for the safety, accountability, and welfare of personnel. In addition, *Section 19* of the incident management guidelines that address staffing of the command support positions states,

- 19.2. Command will staff the Safety Officer function when Command's allotment of time and focus on safety concerns is insufficient for the incident situation.

Examples:

Working fire or other working incidents where other responsibilities require too much of Command's time.

Incidents where Command can not personally see incident operations or building deterioration.

Considering the scope of this incident, overseeing fire ground operations and acting as the safety officer was too much of a burden to be placed upon the IC.

***RECOMMENDATION #6.5:*** Fire departments should make provisions to have a designated Safety Officer at large scale or complex incidents to lessen the burden on the Incident Commander and allow for continuous monitoring of safety conditions at an incident.

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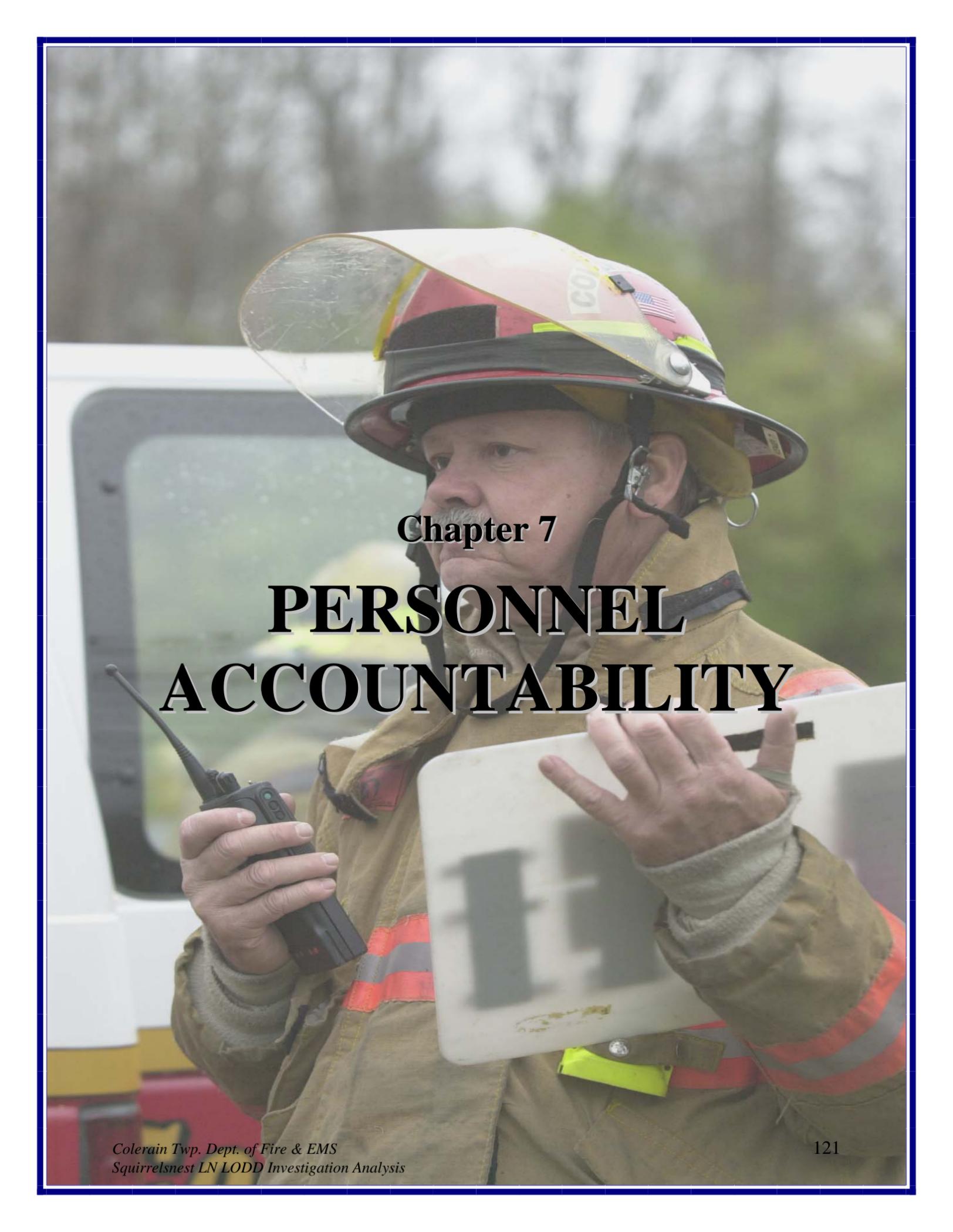
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## INCIDENT MANAGEMENT

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Chapter 7

# PERSONNEL ACCOUNTABILITY



# PERSONNEL ACCOUNTABILITY

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## Overview

Personnel accountability is one of the most critical elements at an emergency incident scene with regard to firefighter safety. Essentially, personnel accountability is an effort to ensure the safety of emergency responders by keeping track of their locations and assignments when operating at the scene of an incident. Historically, Colerain Fire & EMS was the first fire department in Hamilton County to implement a personnel accountability system. Initiated in 1990 in the aftermath of a critical near miss event at a building fire involving a large savings and loan building Colerain Fire & EMS utilized a fabric Velcro® name tag system for accountability. This was the first structured system in the county that provided a rapid account for all personnel operating at an incident scene.

There has been an increased emphasis on fire service personnel accountability at incident scenes in the past two decades. This is at least partially based on incidents where firefighters were injured or died because of their unknown location within a building or at an incident scene. A properly implemented accountability system helps to ensure that the IC has knowledge of the exact number and identity of personnel working at an incident scene, their approximate locations, and whether they are in distress. In some form or another, regardless of size or nature, personnel accountability is a part of every incident to which fire and rescue personnel may respond. Failure to maintain personnel accountability can and does have tragic results. In the event that conditions should deteriorate, a personnel accountability system helps ensure that firefighters are quickly located and rescued, if feasible. The personnel accountability system also helps the IC maintain tactical control of the incident by visually representing the locations and assignments of firefighting teams.

The accountability philosophy involves a personal commitment of all personnel to work within the accountability system at all times. Accountability is more than an accurate listing of names on a board or piece of paper. Accountability is an accurate roster, companies keeping together, staying on the hose line, working in teams, leaving the danger area when low on breathing air, having a functioning portable radio, and knowing what to do if in trouble or separated from one's company or team.

The basic concepts of accountability include the following:

- All department personnel are responsible to utilize the accountability system;
- The minimum size team when operating in an Immediate Dangerous to Life and Health (IDLH) area is two firefighters;
- All teams that enter an IDLH area together should stay together and exit together; and

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- Team members operating in an IDLH area should always be in contact through voice, vision, or touch.

The information sources noted as the fundamental standard for accountability is the NFPA 1500, *Occupational Safety and Health Program* and NFPA 1561 *Standard on Fire Department Incident Management*. NFPA 1500's Section 8.3 *Accountability*, states that, "The incident commander shall maintain an awareness of the location and function of all companies or crews at the scene of the incident" (2008, p. 43). One purpose of the system is to provide a rapid determination of possible missing personnel in the event of structural collapse or unplanned event as expressed in NFPA 1561. Furthermore, NFPA 1561 suggests that a person should be assigned to maintain the location and status of all assigned resources at an incident.

The incident commander is responsible for the overall command and control of the incident. Due to the importance of responder safety, this function should be assigned to dedicated accountability personnel as the size and complexity of the incident dictates. A number of positions could function in this role including a staff assistant(s), chief officer(s), or another responder(s). (NFPA 1561, 2008, p. 37)

Both NFPA standards also put significant responsibility on each individual operating at an emergency scene to participate in the accountability system.

There are several components that make up the accountability system used by Colerain Fire & EMS. First introduced during 1994 in Hamilton County, the system that is generally considered to be the *Passport System* was adopted by several fire departments including Colerain Fire & EMS. Over the years, the system was refined and eventually adopted by the Hamilton County Fire Chief's Association in 2007 and recognized as the county-wide accountability system. Passports involve a plastic card, with fire or rescue company or team personnel names affixed, that is turned over to an accountability officer. The accountability officer may be a fire apparatus operator (FAO) or a designated accountability officer, depending on the nature, type, and complexity of the incident. The responsibilities of the accountability officer include: a) the collection of passports from on-scene operating companies or teams, b) maintaining an awareness of their exact location, and c) maintaining accurate passports of those companies or teams in the *hazard zone* or IDLH area. Components are:

**Nametags** - Nametags are engraved 2½-inch wide by ½-inch plastic strips backed in Velcro® *hooks*.

Nametags are issued with the following information: a) rank, first name initial and last

Figure 38: Sample Colerain Fire & EMS Passport

ENGINE 25 COLF	
Capt. G. Hunt 301 FF Medic	COLF
J. Smith 302 FF EMT	COLF
S. Cole 303 FF EMT	COLF
N. Baker 304 FF EMT	COLF

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name; b) badge number; c) firefighting and emergency medical capabilities; and d) the department's Hamilton County identification name (e.g., COLF for Colerain). Officers have white backgrounds, firefighters have yellow backgrounds, and emergency medical personnel have blue backgrounds (Figure 38).

**Passports** - Passports are engraved 2¾-inch wide by 3¾-inch colored plastic cards that identify a company or unit by its designation. They are used to hold nametags of the personnel assigned to that company or team during their shift. Passports have the apparatus company or unit number (e.g. E102, L25A), the department's Hamilton County identification name, and enough Velcro® *loops* for a minimum of four personnel or the maximum apparatus seating capacity (Figure 38).

Passport colors are provided as follows:

- *Red* for engine companies;
- *Black* for ladder companies;
- *Blue* for advance life support and squad units;
- *Green* for the rescue company and specialized units (e.g., rescue boats); and
- *Orange* for support units (e.g., officers and staff or station vehicles).

**Accountability Status Boards** - Status boards are assigned to all engine companies, ladder and rescue companies, and command vehicles. The Accountability Officer(s) utilizes the board to track those companies or teams assigned to the hazard area or within their area of responsibility.

**Make-up Kit** - The Accountability System make-up kit is designed to provide immediate replacement for lost or damaged components. The kit is assigned to the shift commander's vehicle and consists of: nametags, passports, grease pencils, and a status board for use on large incidents that require additional resources.

**Helmet Company or Unit Identifiers** - Helmet company or unit identifiers are backed with Velcro® and attaches to the front and back of an employee's protective helmet. The helmet identifier has letters and numbers identifying a company or unit (e.g., E109, R26, etc.). The identifiers are black with lime green numbers and letters. The helmet identifier is always to reflect the identity of the company to which the individual is currently assigned.

The Accountability System is initiated at all incidents involving *hazardous areas*, multiple company responses or as directed by the IC. It may be used for non-hazard situations as directed by the OIC. *The use of this accountability system does not relieve supervisory personnel from the responsibility of maintaining an awareness of the location and function of all members under their direct supervision.* All department personnel are responsible to properly utilize the accountability system.

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### Accountability System Process

When a firefighter reports for shift duty, he or she is responsible for attaching one of his or her nametags to the company or unit passport as soon as they place their personal protective equipment on the apparatus.

As fire department units begin arriving at an incident scene, the IC has the ultimate responsibility to designate an Accountability Officer. In an effort to establish accountability as *early* into the incident as possible, the second-due engine company FAO, *if not involved in pumping operations* serves as the initial Accountability Officer. He or she initiates the collection of passports and begins accountability of companies and teams operating at an incident scene. Should the second-due FAO become involved in pumping operations, an early arriving member of the incident management team is assigned accountability responsibilities.

When a company or team reports to an incident scene or to a division, group or sector in the hazard zone, the company officer or team leader transfers their passport to the Accountability Officer with the following exceptions:

- Whenever they are the only company or unit at an incident scene, the passport remains on the apparatus as long as they are in close proximity to the incident scene; or
- When they are the first arriving engine or ladder company or unit committed to the initial operation prior to the establishment of an Accountability Officer.

All subsequent arriving companies or units then deliver their passport to the first-in or most forward operating engine company (e.g., operating in the front of the building) FAO or Accountability Officer, *if they have been assigned to work within the hazard area*.

Whenever a company or team is relieved or reassigned, the Accountability Officer confirms with the company officer or team leader that all personnel are accounted for and returns the primary passport to that company or team;

Personnel arriving at an incident by means other than fire or emergency medical apparatus ensure that they are accounted for in the accountability system by notifying the IC or Accountability Officer of their on-scene status.

All companies and teams entering a hazardous area or building should exit at the same point where entry was made. If hazardous conditions dictate that companies or teams must exit the area or building by a different route other than where entry was

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made, the company or team must report to the Accountability Officer at the original entry point and retrieve their passport.

When multiple points of entry are utilized at a hazardous area or building, an Accountability Officer shall be assigned for each entry point.

It is the responsibility of the company officer, team leader and Accountability Officer to ensure that: a) a minimum of two personnel are assigned to each company, team or task; b) the location and function of each company or team be communicated to the IC.

When a distinct jurisdictional department is on scene utilizing another accountability system, the IC remains responsible for and oversees personnel operations. Should a department respond into a Colerain incident scene, they are free to utilize their own form of accountability, but they remain responsible for reporting their personnel if their accountability system is different. Should personnel from another jurisdiction work on a team with Colerain personnel, they may be assigned a blank label, which their name can be written on with a grease pencil supplied in the make-up kit equipment.

An integral component of any accountability system is the ability for the IC or the accountability officer to conduct periodic roll calls to verify locations and the safety of all individuals and teams operating within the hazard zone. Commonly called a *Personnel Accountability Report* or PAR, the roll call is conducted at specific time intervals throughout the incident and at critical benchmarks during tactical operations.

During emergency incidents, the Hamilton County Communications Center provides 20-minute time interval benchmarks to the IC by means of the Fire Ground Radio Talk-group at which time the IC will routinely call for a PAR during active fire ground operations. Other critical benchmarks in which a PAR is initiated include strategic changes on the fire ground (e.g., offensive to defensive), immediately following any sudden or unexpected hazardous event (e.g., flashover, collapse, back draft, etc.) and after a declared Mayday or suspected lost or trapped firefighters.

### Findings, Discussions and Recommendations

**FINDING #7.1:** The personnel accountability system was compromised and resulted in a significant delay in the incident commander's ability to provide a rapid accountability of personnel when E25's FAO was permitted to reassigned himself from executing the responsibilities of the accountability officer to assume a position with RAT 25's team.

According to the Colerain Fire & EMS Accountability System, Standard Operating Guidelines (SOG), the second-due engine company FAO shall become the designated accountability officer and shall begin the process of collecting accountability

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passports. This ensures the implementation as soon as possible into the incident. In the event that the second-due engine company FAO is engaged in pumping operations the responsibility shall be passed to an early arriving member of the incident management team. An incident such as a building fire is initially managed by the IC, but if the fire becomes complex additional resources are called in to address the incident through the formation of an incident management team to fill division, group and sector supervisor positions.

During this incident, the second-due engine company FAO (E109) was responsible for ensuring a water supply to E102 on the long lay driveway. The IC had been advised that E109's FAO was busy with the water supply and that he would need to assign accountability to another unit. So, the IC exercised his option to assign the accountability function to another *first responder*, instead of an early arriving incident management team member. The IC subsequently assigned E25 FAO to accountability by means of radio at 06:28:55, which was acknowledged by E25 OIC.

As E25's remaining three personnel proceeded to the building to assume RAT duties, E25 FAO was in the process of collecting the passports from the other fire apparatus as directed by his OIC when the Mayday was declared. According to E25 FAO's interview statement,

When we pulled up on scene...told me to assume accountability because he wasn't sure if the initial companies had done that because.... So I grabbed our accountability board out of our engine.... I was still at street level that's when...District 25, he was in Command. He...radioed back saying that he had lost contact. He had not heard from Engine 102's crew. So he asked for our company to go ahead and commence RAT operations. So at that point, I decided that it was probably more important for me to search with my company then to take care of accountability. So I put our accountability stuff on the front seat of our truck.

At this point, the E25 FAO left behind his responsibilities as the designated accountability officer and reassigned himself to become part of the RAT. There were two attempts by the E25 FAO to inform the IC by means of radio of his intentions to join the remainder of his company. He subsequently relayed this information (face-to-face) to the IC, whom authorized the reassignment to strengthen the staffing of the RAT. E25's FAO then advanced forward towards the building to join the remaining personnel of E25 (now called RAT25). Although their actions were believed to be well intentioned, it has been identified as a contributing factor to the significant delay in providing a rapid accountability of personnel operating at the scene. It should be further noted that this type of activity on an emergency incident scene is "counter-productive to the accountability process and places other responders in danger" (IAFC and NFPA, 2008). At 06:52:54, Car 2506 established a formal accountability sector in front of the building.

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**RECOMMENDATION #7.1:** Fire departments should ensure that incident commanders and personnel who are assigned a supervisory responsibility for a tactical level management unit that involves multiple companies or teams under their command shall have assigned a person(s) to facilitate the ongoing tracking and accountability of all assigned companies.

Indisputably, personnel accountability must be maintained throughout each and every emergency incident. No incident, including major fires and technical rescue operations will ever demand greater accountability efforts on an incident scene than an event involving a lost or trapped firefighter. Emotional surges and feelings of a desire to act must be controlled through personal discipline and strictly enforced and adhered to accountability guidelines or procedures.

**FINDING #7.2:** Personnel Accountability Reports were significantly delayed as a result of the delayed establishment of the Personnel Accountability System during the initial stages of the incident.

During this incident, there appeared to be several missed opportunities to conduct an accurate PAR, according to radio communication transmissions. At 06:34:48, E25's OIC radioed, "25 for Command, per ... (Ffr. #2), he was on crew one. He has lost contact with his crew at this point. He does not know where they're at. We need to do a PAR."

At 06:43:08, Command radioed, "Rear from Command, I want to identify who we don't have an accountability for. So we're going to do a PAR. Accountability, roll off a PAR."

At 06:44:26, Car 2501 radioed, "Car 6, I want you to respond down to accountability and we're going to run a PAR here. Just report down to accountability to start with."

At 07:15:08, Car 2514 radioed, "Front to Command, could we get a PAR? I've got an E109 that I don't know where their accountability is and I'd like to get a straight PAR now."

At 07:33:49, the first declared *completed* PAR is announced over the radio after the accountability officer conducted a face-to-face interview of all units assigned to the first alarm. It is important to note that although there had been several radio transmissions related to accountability and the identification of what companies and teams were determined to be missing, it was not until 07:33:49 that the formal accountability officer officially declared a PAR over the radio.

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None of the abovementioned radio transmissions were specifically acknowledged over the radio. Although there were sporadic transmissions regarding accountability for individual companies and teams at times, the absence of a coordinated PAR was clearly delayed during the incident.

**RECOMMENDATION #7.2a:** Fire departments should ensure that all incident commanders are properly prepared to manage an incident scene emergency through the development and implementation of training and education programs.

**RECOMMENDATION #7.2b:** Fire departments should enforce and monitor SOG compliance of personnel accountability reports through training exercises, simulation exercises and post-incident analyses.

Initiating a PAR enables the IC to quickly and effectively identify the number of personnel involved during a catastrophic event, the general area of the building involved, and potential extent of the rescue effort. PARs, like search efforts should be first requested from the personnel in the area of most danger (e.g., collapse occurs of first floor, Charlie Side - personnel operating in that immediate area should be accounted for first).

The importance of a PAR cannot be overly emphasized. Until the IC knows exactly how many firefighters are directly involved (e.g., trapped, lost, etc.), he or she cannot properly initiate an effective rescue effort. The PAR enables the IC to prioritize the fire ground, and potentially limit the response area, which will in turn expedite the search or rescue efforts of the RAT's.

**FINDING #7.3:** Once the accountability system had enough personnel to fill key roles, it functioned according to Colerain Fire & EMS guidelines ensuring accountability of personnel operating at the scene for the remainder of the incident.

Early in this incident, evidence clearly indicated that the IC and early arriving company officers were concerned about the accountability of personnel. Following the delayed collection of accountability passports, a concerted effort was made to assign personnel to positions that would account for personnel operating at the incident. Once a sufficient number of command staff personnel arrived at the scene, the accountability system became fully operational. This was evident by the establishment of an accountability officer at each of the points of entry into the building. At 06:52:54, a front sector accountability officer was assigned to the front of the building. Eventually, a rear sector officer was established. The first PAR was achieved and announced after 07:30 hrs.

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**RECOMMENDATION #7.3:** Fire departments should routinely implement its accountability system and ensure that all personnel are well-versed in its operation.

To ensure the effectiveness of a fire department's accountability system it should be routinely initiated and adaptable enough to allow for implementation at a variety of incidents. This initiation and adaptability will help ensure that the system enhances safety at an incident scene without having a unfavorable effect on critical tasks by delaying or reducing firefighting forces for fire attack, ventilation, and the primary search for occupants. Additionally, a designated officer or firefighter (others can also be assigned to maintain accountability at remote entry points) should be assigned to provide oversight of personnel accountability during an incident. It is important that the IC be allowed to develop incident strategies and operational divisions, groups or sector supervisors manage resources, and focus their attention on the incident without having the additional burden of managing the accountability of personnel.

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## Chapter 8

# COMMUNICATIONS



# COMMUNICATIONS

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## Overview

Today's fire service relies more heavily on effective communication than ever before and recent technological advancements have made the communications process more effective.

The Hamilton County Communications Center (HCCC), located in Colerain Township, Ohio, is the primary emergency radio and communications center for most emergency service organizations within Hamilton County. The HCCC consists of two divisions. The Public Safety Communications Division is a consolidated Enhanced 9-1-1 center that serves the emergency communications needs of over 105 police, fire and emergency medical service agencies in 42 political jurisdictions serving over 500,000 Hamilton County residents. The Telecommunications Division provides telephone and data technical infrastructure support to all County departments. The City of Cincinnati and two smaller governmental entities utilize alternative emergency communications means including their own emergency communications centers.

Recently, the HCCC and all emergency service providers underwent a major upgrade in their communications infrastructure, hardware and policies. Included in this upgrade was a completely new 800 Megahertz (MHz) radio system that would allow for enhanced interagency communications. This new communications system included new mobile and portable radios as well as mobile data computers (MDC) in designated emergency response vehicles. The programming template utilized on the mobile and portable radios was identical for all agencies utilizing HCCC services.

In 2006, the Colerain Fire & EMS had completely updated all of their communications equipment to include the new hardware. Each front-line, reserve fire and emergency medical, staff and command vehicles were equipped with 800 MHz Motorola *Astro* mobile radios. As well, all front-line fire apparatus were equipped with a mobile data computer, which provided a means of updating unit status changes (e.g., responding, at-scene, available, etc.) electronically and provided the capacity to store street maps and building plans. In addition to the mounted hardware, the department also provided an 800 MHz Motorola *Astro XTS5000* digital portable hand-held radios with a Motorola *NMN-6193* lapel microphone for every *seated* position on the emergency fire response vehicles. (The typical Colerain Fire & EMS response staffing includes: four positions for all engine companies, five positions for L25, three positions for R26.) All emergency medical units are also equipped with one portable radio.

All mobile and portable radios are equipped with a unique, seven-digit identification number that is transmitted with each transmission. This identification number is displayed at the communications center fire dispatch console and on the screen of all other users monitoring the talk group. If programmed, the fire dispatch consoles

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will display a text alias associated with the number. An example of an identification number will appear as: 225010, which identifies the radio as a Colerain Fire & EMS radio and number ten in its inventory. This identifier is recorded and time stamped by the fire dispatch console every time the radio transmits. In addition every radio voice transmission is also recorded, with time stamp, on a separate digital radio voice recorder.

During the county-wide communications upgrade several aspects of the new system were phased-in, which included newly developed procedures and practices. This included an enhanced ability of the HCCC using a Computer-Aided Dispatch (CAD) system to pre-determine alarm or response assignments based on district, address or by type of incident information provided by each fire department. These agency defined *alarm cards* identify the number and types of apparatus and units that should be assigned and dispatched to an emergency incident detail. In the event that a unit is already committed to an emergency detail, or is unavailable, the CAD system can automatically identify the next closest identified unit to replace any unavailable units.

### **A Typical Fire Incident Dispatch**

When a 9-1-1 telephone call is received, the HCCC determines the nature of the call and what services are needed: police, fire or emergency medical services. In the event of a building fire incident, the appropriate fire departments are alerted by means of radio and a Plectron in the fire station. A Plectron is a specialized single-channel, emergency alerting radio receiver, used to activate emergency response personnel. The dispatch radio channel is two-way as dispatch communicates with all fire and emergency units simultaneously within Hamilton County. Police have their own dispatch channels. Within minutes, firefighters acknowledge the incident by using their radio and MDC. If the fire is of significance, other fire companies or departments are dispatched. Generally, the ranking officer of the first company to arrive is the IC and provides a radio report of his or her observations and initial actions. He or she establishes radio communication with the firefighters under his or her supervision, and command is then passed to or assumed by the first arriving staff officer.

The radio system has a capacity for as many as 50 zones of radio talk-groups (frequency channels) and 16 talk-groups per zone. Hamilton County fire departments have their own zone, split among East and West, but all talk-groups are accessible from all radios. During a fire incident, the fire telecommunicator (dispatcher) assigns a fire ground talk-group for radio-to-radio communications amongst responding and engaged units at the incident scene; this is also the talk-group that the IC communicates with all firefighting personnel. Personnel are organized by company or team, each company or team has a minimum of two persons, one radio per person. If the fire incident is sufficiently large, there may be more than one fire ground talk-group assigned to handle different assignments amongst divisions, groups or sectors working to control an

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incident. It is essential that fire ground talk-groups not be cluttered with excess radio traffic. Every firefighter at the incident has the ability to hear all radio transmissions on the fire ground talk-group, including the IC, and is knowledgeable about what is going on at his or her incident. The IC uses the fire ground talk-group to communicate with divisions, groups or sectors supervisors at the incident to coordinate activities and share information.

Key to effective firefighting, indeed all of emergency management is *situational awareness*; the IC and all firefighters need to have the best and most complete information about what is happening. Open communications is the only way to accomplish this goal. Everyone operating at an incident scene has a responsibility to make sure critical information is heard by or relayed to the IC. Radio communications *interoperability* (the ability of two or more systems or components to exchange information and to use the information that has been exchanged) is vital to situational awareness; in order for the IC to best deploy the resources at hand, he or she must have the most recent and complete information as possible. As many eyes and ears must contribute to that knowledge by means of communications.

An important part of both situational awareness and the ability to command and control is interoperability with other agencies, such as police and other fire and emergency medical services outside of Hamilton County communications network. Hamilton County borders Butler, Clermont and Warren Counties in Ohio, as well as Dearborn County, Indiana, and each area often finds itself responding to incidents across county and state lines.

### Findings, Discussions and Recommendations

**FINDING #8.1: Hamilton County Communications Center failed to update responding units in an acceptable time frame of an actual working fire in the basement.**

The HCCC received notification from ADT of the automatic fire alarm activation at 06:11:23 and the detail was subsequently dispatched to Colerain Fire & EMS at 06:13:02. As stated in the *Incident Overview* section, the female homeowner then made subsequent telephone calls to the HCCC to notify them of an actual fire in the basement.

According to telephone data logs retrieved from HCCC, the first telephone call from the homeowner was received prior to E102 acknowledging the detail and going en-route to the scene at 06:13:43. It was not until 06:20:43 that the HCCC advised responding units of reports of an actual working fire in the basement of the building. At 06:22:02, the response was upgraded to a working fire and additional units were dispatched at the request of E109's OIC.

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Colerain Fire & EMS utilizes a *reduced response* protocol for automatic fire alarm activations associated with building occupancies. Automatic alarm activations include activations of fire alarm systems smoke alarms, sprinkler systems and other automatic detection or suppression systems and devices. During this incident, an initial reduced response complement of two engine companies, one ladder company and a battalion chief were dispatched with only the primary engine company responding with lights and sirens to the scene. Alternately, the protocol for a reported residential building fire states that an *additional* engine company that functions as a RAT, one (heavy) rescue unit, and one emergency medical transport unit with all responding units utilizing lights and sirens.

The Investigation Committee determined that the delay between the HCCC receiving information that the incident was indeed a *working* fire, and the time that the information was relayed to the responding units was *greater than eight-minutes*. This delay is considered a critical factor in this investigation, especially when taking into consideration that the HCCC had actually received the information prior to E102 responding to the scene.

***RECOMMENDATION #8.1a:*** Fire department emergency communication agencies should ensure *public safety telecommunicators* (an individual whose primary responsibility is to receive, process, or disseminate information of a public safety nature by means of telecommunication devices) are properly trained to provide all necessary information to emergency response agencies.

***RECOMMENDATION #8.1b:*** Fire department emergency communication agencies should review policies and procedures regarding when to and the manner in which it upgrades incident responses.

***RECOMMENDATION #8.1c:*** Fire departments should continually collaborate with emergency communication agencies to provide performance feedback and enhance communication abilities between response agencies.

***RECOMMENDATION #8.1d:*** Fire department emergency communications agencies should upgrade response complements as soon as it receives updated information rather than delaying the upgraded dispatch by contacting responding units first.

Emergency communications systems serve as the backbone for firefighters in gathering and sharing information, coordinating response, and requesting additional resources and mutual-aid from neighboring jurisdictions. Using effective communications firefighters and ICs rely on others to provide pertinent response related information from telecommunicators to responding apparatus and ongoing progress reports so that a strategic plan can be made. Without this ongoing flow of information, it

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is difficult, if not impossible, to develop a plan that takes into account all of the critical factors that will assure a safe operation.

Proper situational awareness is crucial to firefighters. Their actions can mean the difference between life and death. The stresses in the HCCC during incidents of this magnitude are tremendous and those employees who work in that center do a tremendous job under such conditions. However, firefighters can act more quickly and productively if they have all the information they need.

Requirements for the professional qualifications for public safety telecommunicators are found in the NFPA's *Standard for Professional Qualifications for Public Safety Telecommunicator* 1061. The standard describes several essential knowledge, skills, and abilities required of the Telecommunicator related to the relay of information to response units. The following sections of the standard are addressed, "4.4.2\* Relay information to other telecommunications personnel or entities, given processed data, so that accurate information regarding the request for service is provided" (NFPA, 2007, p. 10). Section 5.4.3 states, "Relay service request information..., so that all pertinent information is communicated to all responding units and agencies" (NFPA, 2007, p. 12). Section 5.4.4 states, "Acquire supplemental information, given a service request, so that current information is evaluated, prioritized, and relayed to response units or other personnel and agencies as needed" (NFPA, 2007, p. 12).

In the NFPA's, *Standard for Fire Department Incident Management System* 1561, 2008 Edition, it also addresses communications throughout the standard. In Section 3.3.25 *Imminent Hazard* is defined as "An act or condition that is judged to present a danger to persons or property that is so urgent and severe that it requires immediate corrective or preventive action" (2008, p. 9). It further states in Section 6.3.2 that, "The communications system shall provide a standard method to give priority to the transmission of emergency messages and notification of imminent hazards over that of routine communications to all levels of the incident command structure" (2008, p. 29).

**FINDING #8.2: The Fire Apparatus Operator (FAO) of E102 did not hear radio transmissions from the interior team and therefore, did not take immediate actions when requests to charge the attack hose line were transmitted.**

According to radio data logs, there were three transmissions between 06:26:36 and 06:29:03 requesting the initial attack line to be charged by the FAO. The noise level near the apparatus pump and engine is believed to have impaired the ability of the FAO to hear and respond to radio traffic. This was evidenced by radio traffic between the IC and E102's FAO as, "E102 FAO, are you holding up interior water because of the hydrant water?" "No, sir. I didn't hear them call."

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The portable radio configuration used by the department's FAO's includes the 800MHz portable radio with a lapel microphone (Figure 39). The lapel microphone can be placed in a myriad of positions based on the user's preferences. This can significantly impede the ability of the FAO to hear critical radio transmissions from other units on scene.

*Figure 39: 800 MHz portable radio utilized by Colerain FAO's.*

Additional considerations that may obstruct the FAO's ability to hear radio transmissions include background noise, extraneous conversations, vehicle noise and simply the FAO's focus on tasks at hand that may cause a momentary inability to process the radio traffic.

This issue is not isolated to FAO's. Division, group or sector officers and other designated personnel using the portable radios with a lapel microphone can also encounter poor audio conditions and find it difficult to hear the radios.

It is for the aforementioned reasons that Colerain Fire & EMS ICs practice the establishment of a stationary command post using the *interior* of their vehicles with windows in the up-position. The interior of the vehicle provides lighting, communications, equipment, reference items, and limited isolation from distractions, which makes Command more effective.



**RECOMMENDATION #8.2a:** Fire departments should provide all fire apparatus operators with communication equipment (e.g., headsets) that limit background or outside noise and allow an improved capacity to hear radio communications.

**RECOMMENDATION #8.2b:** Fire departments should provide communication devices or research other forms of communication equipment that ensures the incident commander and assigned division, group or sector supervisors have an improved capacity to hear radio communications.

Communication is an on-going component of emergency scene operations. Emergency incident scenes can become very chaotic within a short period of time. Radio communications occurring between the IC, firefighting teams, and apparatus operators can be easily obscured or unnoticed. In May 2008, the IAFC released a document titled *Interim Report and Recommendations: Fireground Noise and Digital Radio Transmissions*. The intent of the report was to alert the fire service that noise on emergency incident scenes can interfere with intelligible radio communications. The

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report recommended the use of radio accessories to reduce the impact of background noise,

Radio accessories can dramatically reduce the impact of background noise on audio intelligibility. Special attention must be paid when selecting radio accessories to ensure they are compatible with the environment they are to be used in. Many accessories may not be compatible with the structural firefighting environment; agencies should carefully evaluate the specific accessories for the operational environment where they will be used. (IAFC, 2008, p. 7)

Interior attack teams must have effective radio communication with the IC and with other companies or teams to provide for personnel accountability, coordination of efforts, fire conditions, fire extinguishment, and other pertinent information. As the IC becomes aware of changing conditions, vital information can be given directly to firefighting teams.

**RECOMMENDATION #8.2c:** Fire department emergency communications agencies should assign a dedicated telecommunicator to monitor working building fires and other significant incidents.

A dedicated telecommunicator assigned to working building fires and other significant incidents ensures continuity of information while other telecommunicators process additional aspects of emergency communications. In addition, the dedicated telecommunicator would have the responsibility of monitoring radio transmissions separate from other dispatching duties to ensure no key fire ground transmissions are missed. This telecommunicator must have an understanding of the fire ground environment to ensure their ability to triage messages (e.g., Mayday) according to importance and re-broadcast any vital messages.

**FINDING #8.3:** Fire fighters experienced intermittent radio communication problems and interruptions which significantly hampered attempts to transmit pertinent radio traffic.

While the operations of the fire ground rely on pertinent, timely and clear information, there can be times when communications can be considered a distraction or even a drain on the communication resources available to the system. During this incident fire fighters experienced intermittent radio communication problems and interruptions.

Radio data logs of the fire ground talk group recorded multiple instances where firefighters inside the building attempted to transmit over the radio, but the transmissions were not heard or not understood. The radio data logs identified these radio transmissions as either *blocked* or *rejected*. These circumstances can occur as one radio

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user is transmitting and another radio user attempts to *key* the microphone. The second user will be rejected by the system due to the limitations of the 800MHz system.

The review of the radio data logs revealed what should be considered multiple *critical rejections* of radio transmissions from all personnel assigned to E102's interior team including Capt. Broxterman and Ffr. Schira. These rejections came between the times of 06:27:52 (the last audible transmission from Capt. Broxterman) and 06:34:48 (at which time E25 crew located E102 Ffr. #2 outside of the building). During these seven-minutes, it is *unclear* what information each of the interior team personnel were attempting to transmit.

There were multiple sources of these critical rejections, including *normal* fire ground operations radio communications. However, further examination of the radio data logs also revealed a phenomenon that, up until April 4<sup>th</sup> had not been considered – radio users from *outside agencies* throughout the entire HCCC listening range were activating radios and monitoring the fire ground operations on Squirrelsnest Lane.

While individually one would think each of these radio activations presented little or no potential harm. On the contrary, the combined activity occupied valuable bandwidth of the communications system potentially rejecting or otherwise blocking communications of on scene fire companies engaged in firefighting operations. It should also be noted that there were also multiple instances of these outside agencies accidentally or unknowingly activating their *Push to Talk* (PTT) button on their radios, thus capturing the fire ground talk group and preventing any additional units from transmitting, including Capt. Broxterman and Ffr. Schira. The review of the radio data logs identifies at least one *inadvertent* radio transmission directly prior to one of Capt. Broxterman's failed attempts to transmit. It is possible that this rejected radio transmission may have been an attempt by Capt. Broxterman to transmit critical information or distress information (e.g., Mayday) to the incident commander. From 06:11:00 to 06:45:00 hrs., there were *43 rejections* on the fire ground talk-group (Channel 2). During the aforementioned period of time, there were *22 different agencies* and *75 different* non-participants or *radio users* not associated with the incident monitoring the operations. The information from the radio data log can be reviewed in Appendix C.

Daryl Jones of Telecommunications Engineering Associates explains in a commentary as to what happens when too many listen to a trunked radio system,

Most digital trunked radio systems that serve large geographic areas are comprised of subsystems for specific geographic areas. These subsystems are linked together and controlled by a centralized computer so that the subsystems can act as one large system. Individual agency radios are "homed" on the subsystem that provides the best coverage for their primary geographic area. When an individual

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radio is operated outside of its home zone, the central computer will attempt to make the user's talk group active in the zone where the user is currently affiliated. Merely turning a radio on will cause the radio to affiliate with the talk group. The act of merely listening can consume limited resources and negatively affect communication at the scene of the incident.

A trunked talk group will assume the characteristics of whatever sites get added to a call. If a user is on a site that has only a few channels available, the system may not be able to assign a channel for the talk group and the user who is attempting to transmit a message will get a busy signal, even if there are enough channel resources at every other site involved in the communication. To illustrate this point, consider a major incident such as the bridge collapse where hundreds of radio users throughout the large coverage area want to listen to the critical incident, even if they are not directly involved. This can cause the talk group that is being used for the incident to become active in many zones where it wouldn't normally be used. If channels aren't available in all of the zones where the non-participant listeners are affiliated, the trunked radio system will return a busy signal for the users who are directly involved in the incident even if channels are available in the area near the incident. (2009, ¶ 4-5)

**RECOMMENDATION #8.3a:** Fire department policies and procedures must be in place that stipulates radio discipline and promotes only relevant and pertinent information be transmitted by means of on-scene radio transmissions.

**RECOMMENDATION #8.3b:** Fire departments should limit unnecessary radio transmissions during fire ground emergency operations. In addition, radio transmissions should be short, concise and relevant to the situation at hand.

**RECOMMENDATION #8.3c:** Fire department radio communications, including those during critically stressful situations should be continually assessed and practiced.

**RECOMMENDATION #8.3d:** Fire departments should provide comprehensive radio communications training, which should emphasize strict discipline when utilizing radio equipment.

**RECOMMENDATION #8.3e:** Fire departments should be encouraged to utilize Mobile Data Computers (MDC) or Mobile Status Terminals (MST) in vehicles to record status changes (e.g., enroute, on-scene, available, etc...). Data transmitted by means of the MDC or MST utilize far less bandwidth than the voice communications used during radio transmissions.

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In the course of providing emergency services to the public, fire department personnel are required to communicate with one another by means of two-way communications equipment. Training and practice is essential to the effectiveness and efficiency of the public safety communications system.

A first step in proper communications techniques is a familiarization with the communications equipment to be utilized by the firefighter. There are many different forms and manufacturers of communication equipment items that firefighting personnel will encounter during their work, and as technology changes manufacturers are continually introducing new products which will always present new user challenges. As a minimum, communications systems are comprised of mobile and portable radios and various other radio accessories. Additionally, they may include more complex aspects such as cellular devices and MDC's to only name a few.

Firefighting personnel should take sufficient time to learn the correct operation of each item of communications equipment that they are issued. They should fully investigate the various features and limitations of that equipment in order to maximize the extent to which the equipment assists in delivery of emergency services. Firefighters should be encouraged to ask questions of their colleagues, equipment maintenance technicians and manufacturers' representatives to ensure understanding.

The objective of emergency service communications is to convey information in a *accurate, concise, and unambiguous* manner. The communications skills exhibited by fire department personnel can certainly have positive and negative influences on the outcome of a particular incident.

To minimize a negative influence *radio discipline* must be maintained. Consideration and regard for the communications of others utilizing the fire ground talk-group go a long way in preserving order, especially during a significant incident with much radio traffic. Firefighters should monitor the talk-group before transmitting to prevent interference or blocking the frequency of other users. Think ahead and keep transmissions short and to the point to maximize airtime.

Firefighters should practice verbal communications skills. Speak distinctly, at a moderate rate, and directly into the microphone or handset to maximize intelligibility. Keeping the microphone close to the mouth overcomes background noise and permits the operator to speak in a normal tone of voice. Shouting should be avoided as it results in audio distortion. Use plain language to describe a particular condition or situation. Individuals under stress may find it easier to relate clear and simple descriptions.

From a technical perspective, the complexities in communications system design often introduce a delay in the time it takes to turn-on the various components comprising

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the system. Radios take time to come up to full power output, tone squelch decoding equipment requires time to open receivers and receiver voting systems take time to select the best receiver. While these events generally are accomplished in a few seconds time, there are many voice transmissions that could be missed in their entirety if the firefighter did not delay slightly before beginning his or her voice message. Pausing one second after depressing the PTT button on the microphone or handset is sufficient in most cases to prevent missed words or responses.

While it is impractical to expect other agencies to refrain from monitoring or listening to local fire ground operations, *all agencies that utilize the HCCC 800 MHZ communications system must be made aware of the potential to interfere or block critical radio transmissions at an emergency incident scene.* Care must be taken when turning on communication equipment not to accidentally or inadvertently transmit or push the PTT button.

**FINDING #8.4a:** There was a substantial time delay while telecommunicators from the HCCC notified neighboring Butler County fire departments of Colerain's request for mutual-aid to the time of arrival of fire companies at the incident.

**FINDING #8.4b:** Butler County and Hamilton County's incompatible radio communications equipment hampered responders ability to communicate with each other directly by means of radio.

At 06:37:53, the IC radioed the HCCC to request a second alarm as a result of the Mayday situation. The additional alarm complement of fire companies included three additional engine companies, one ladder company and a heavy rescue company. One of the engine companies (Ross Twp. E11) and the heavy rescue company (City of Fairfield R1) are units stationed in neighboring Butler County. At 06:38:49, HCCC broadcasted the second alarm complement of fire companies by means of the main Hamilton County dispatch frequency. The method for notification to Fairfield and Ross Twp. from the HCCC was by means of the *seven-digit* telephone number to each jurisdiction, since each department is dispatched by separate emergency communications centers.

The Ross Twp. Fire Department is a combination fire and EMS agency comprised of approximately 65 part-time and volunteer personnel that provides service from two fire stations. The stations are staffed with four part-time personnel (two at each station) from 06:00am to 6:00pm seven days a week along with a full time fire chief. Emergency communications for Ross Twp. is provided by the Butler County Sheriff's Department. The Butler County Sheriff's Office telecommunicators process calls and dispatch for the sheriff's deputies, as well as five law enforcement agencies, 11 emergency medical agencies and 18 fire departments located in Butler County. Upon receipt of an incident

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alarm, the part-time personnel are supplemented by volunteer personnel that respond to the fire stations to staff fire apparatus.

At the time of this incident, Ross Twp. personnel had no radio means of communicating with Colerain Fire & EMS units. According to statements received from Ross Twp. personnel, E11 was dispatched at approximately 06:44:00 by the Butler County Sheriff's Office. Ross E11 arrived on-scene at approximately 06:58:00; approximately *21 minutes* following the initial request for mutual-aid. Upon arrival, a Ross Twp. firefighter, whom was also employed as a firefighter with Colerain Fire & EMS retrieved an unutilized portable radio from L25 and radioed the IC of their presence on-scene. The firefighter's ability to secure the unutilized radio provided Ross Twp. personnel the means to communicate with operating Hamilton County fire companies at the incident scene.

The aforementioned information indicates a six to seven-minute delay in the dispatch of Ross Twp. fire companies. A review of audio recordings revealed that there was excessive time exhausted by the Butler County telecommunicator obtaining driving directions for Ross Twp. prior to dispatch. This was carried out not having the knowledge that Ross Twp. was issued Colerain Twp. street guides that provided driving directions. Obtaining driving directions before the dispatch of Butler County fire departments when providing mutual-aid outside of their county is a common practice of the Sheriff's Office telecommunicators.

The Fairfield Fire Department is also a combination fire and EMS agency is comprised of approximately 75 career and part-time personnel that provide service from three fire stations. Fairfield's fire stations are staffed 24-hours a day. Emergency communications for the City of Fairfield is provided by the their own emergency communications center. The Fairfield Emergency Communications Center telecommunicators process calls and dispatch for the city's police department and fire and emergency medical services department.

According to Fairfield's fire incident report, R1 was dispatched at 06:51:00 by the Fairfield communication center. Due to the fact that Fairfield Fire Department regularly provides and receives mutual-aid to and from several Hamilton County fire departments, each unit was equipped with one 800 MHz portable radio in order to communicate with mutual-aid companies. Fairfield's, R1 arrived on-scene at 07:03:00; approximately *26 minutes* following the initial request for mutual-aid.

During interviews, it was indicated that historically there was a regularity of delays between the communication agencies in the notification for fire department mutual-aid. It was noted that on occasion by the time Fairfield units were being dispatched into Hamilton County; on-scene Hamilton County units were disregarding or canceling

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Fairfield units. Telecommunication records were unavailable during the period of evidence collection for this incident.

It can be reasonably theorized that on April 4, 2008, there was one HCCC telecommunicator assigned to make the notifications to both the Butler County Sheriff's Department and Fairfield Emergency Communications Center. As the lone HCCC telecommunicator made the first notification to Butler County, this call took several minutes to complete as the telecommunicator provided the necessary incident information (e.g., resources requested, location and driving directions) before Ross Twp. Fire Department was dispatched. Upon completion of the Butler County notification, the HCCC telecommunicator then made the telephone call to Fairfield. The differences in time also takes into consideration the equipment used to record time by the three emergency communications agencies may not have been synchronized.

***RECOMMENDATION #8.4a:*** Fire departments and emergency communications centers should develop and strengthen regional mutual-aid communication plans, including procedures, radio talk group use and management.

***RECOMMENDATION #8.4b:*** As jurisdictions build or upgrade current radio communication systems, that priority should be expanded to include the provision of reliable and interoperable local and regional communications.

***RECOMMENDATION #8.4c:*** Fire departments should utilize the concept of Unified Command when multiple agencies respond to an incident.

Despite unprecedented advances in technology, fire department agencies still struggle to communicate with each other during incidents that cross jurisdictional boundaries. In discussing the issue of interoperable communications, it is important to recognize that interoperable communications is not merely a technological issue. It is rather a key means of achieving a desirable objective – the effective response to and the command and control of incidents or events that require the coordinated actions of emergency responders. These incidents could encompass a wide range of possibilities, such as building fires, multi-vehicle accidents, and man-made or natural disasters that involve multiple casualties and fatalities. A lack of interoperability between various responding agencies detracts from the timeliness and overall operational success of the various public safety agencies. All emergency responders must be able to quickly and effectively communicate with each other and within the incident command and control structure.

Interoperable communications is also but one component, although an important one, of effective incident management planning and operations structure. As a standard practice, fire departments should establish communications capabilities to support

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command and control of their operations at an incident scene. Determining the most appropriate means of achieving interoperable communications must flow from an effective planning and operations structure that identifies who is in charge and who must be able to communicate what information to whom under what circumstances. For example, there are likely to be both similarities and differences in the interoperable communications capacities, procedures, and participants associated with responding to routine incidents and to those that are more complex.

While operating at incident scenes that require the response of outside agencies and departments, the concept of Unified Command must be utilized. Under this concept, a representative from each agency involved with the incident should contact or stand-by at the Command Post for orders from the IC. These representatives will exchange pertinent information with the IC to reduce the chance of freelancing and increase accountability of personnel on the scene.

**FINDING #8.5: During this incident firefighters encountered radio communications equipment malfunctions likely related to the hostile fire environment.**

During this incident, firefighters cited instances of an inability to differentiate between a voice transmissions and background noise. Extremely poor environmental conditions and noise from ambient sources negatively impacted the ability of firefighting personnel to effectively communicate. The radio transmissions were often described as distorted and unintelligible.

In addition to the previously identified problems, the current portable radio in use is considered by many not suitable for the environmental conditions in which firefighters are routinely subject to during building firefighting operations. First, the radios and their accessories are not waterproof. This fact makes it necessary for the radio to be protected from our primary extinguishing agent: water. Secondly, accessibility problems are characteristic of the current radio, as radios must be concealed underneath the protective clothing ensemble for maximum protection from the environment. Operational features of the radio such as the volume switch, talk-group and zone selectors, and the emergency-distress button, even when accessible, are difficult to operate with a gloved hand.

The use of the self-contained breathing apparatus, while critical to the safety and survival of the firefighter, it's face-piece design *possibly* hampered or interfered with effective communications, both face-to-face (intra-company), and by means of portable radio due to high levels of background noise and the barrier imposed by the face piece even though equipped with a voice amplification system. The two deceased firefighter's face pieces were destroyed as a result of exposure to heat and direct flame, so it is unknown the operational status of the two firefighter's face piece voice amplification system at the time of the incident.

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**RECOMMENDATION #8.5:** Fire departments and radio manufacturers should initiate studies that researches communication technology that affords a highly reliable and user friendly communications system that facilitates both integrated intra-company communications as well as the ability to communicate with command.

Communications between firefighters and company officers by visual and audible means must exist at the company or task level. Interior teams must continually apprise their company officers regarding conditions, location, and what they are doing. At the same time, company officers responsible for teams must solicit information from their personnel and convey it to the IC. Having the ability to communicate on routine issues while operating at the task level without tying up the radio communications system is essential. In an ideal world, firefighters should be able to communicate with one another and the IC at all times, regardless of where they are or what they are doing. For this reason communications systems must provide the user with the ability to receive and send messages with clarity in loud ambient noise environments.

**FINDING #8.6:** During MAYDAY operations, the HCCC distracted the Incident Commander to advise of another pending dispatch within Colerain Township rather than dispatching subsequent units as indicated on predetermined run assignment cards.

At 07:01:33, the HCCC transmitted a notification to Command advising of an additional building fire emergency within Colerain Twp.. The total time needed to advise Command occupied approximately only one-minute however, during that time, there was additional radio transmissions occurring on the Mayday talk group (FG11). Limitations inherent to the 800MHz system become exacerbated with increased bandwidth utilization. Therefore, it is imperative to limit the amount of extraneous radio transmissions, which will allow the IC to remain focused on strategic and tactical management.

During this incident, the notification to command of an additional emergency within the Township was not a priority to the IC, nor, did the additional information concerning the responding units. When considering the stressful situation in which the command officers were engaged, distractions should have been kept to a minimum. The HCCC should have relied on the CAD system to determine the appropriate units to assign and dispatch to the additional detail.

**RECOMMENDATION #8.6:** Fire department emergency communications centers should develop policies and procedures that define: standard message format, important and urgent messages versus routine messages.

The operation of today's emergency communications centers is dependent upon information and the ability to manage it. Managing radio discipline is critical for

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effective communication among firefighters, telecommunicators, and other emergency personnel. As previously discussed, a lack of radio discipline can overwhelm communication systems, but more importantly be a distraction for those managing an incident, which has potential to seriously compromise firefighter safety.

Telecommunicators are a critical component of the emergency communications process. They must have an in-depth understanding of the fire ground environment to ensure their ability to triage messages according to their importance and re-broadcast messages vital to the command and control of an incident. Telecommunicators should be continually involved in fire ground communication by actively listening for transmissions that might go unnoticed and conveying pertinent information to the IC. However, care must be taken to minimize radio transmissions during critical periods of the incident operation. This can be accomplished through the development of standard operating guidelines or procedures that describe standard message formats and distinguishing between routine and urgent messages.

At the same time, those responsible for managing complex fire or emergency incidents will need support to ensure the effectiveness of fire ground communications. It is not possible for a single individual to manage an incident scene, ensure accountability, make strategic and tactical decisions, and monitor one or more radio talk-groups. Even at routine incidents the potential for information overload is very real. ICs should be provided with aides or advisors early in an incident to help them manage communications and other tasks while minimizing distractions and interruptions. Multiple aides may be needed to monitor radio transmissions if several radio talk-groups are used simultaneously. Dispatching additional incident management personnel to significant incidents can help alleviate the communications burden on the IC.

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A photograph of several firefighters in full protective gear, including helmets and oxygen tanks, standing in front of a white fire truck with a red ladder. The ladder has "COLERAIN" written on it in yellow. The firefighters are wearing tan and red uniforms. One firefighter's name tag reads "BEIGER". Another firefighter's helmet has "M25" on it. The scene is outdoors, and a building with a red awning is visible in the background.

## Chapter 9

# FIREFIGHTING RESOURCES



# FIREFIGHTING RESOURCES

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## Overview

Firefighting is a business of numbers and resource allocation. Studies conducted through numerous organizations have proven time and time again that the safest and most effective fire scene operations are directly related to the appropriate allocations of manpower and resources. NFPA 1710 provides recommended standards and staffing for safe fire ground operations based on case studies and research. According to Dr. Dennis Onieal in 1993,

...Cited research firmly and unequivocally concludes that for an engine company or ladder company, the minimum acceptable staffing level is four. That number of fire fighters is the minimum number required to successfully accomplish the fire ground tasks required within an acceptable time period. Four is not the number at which negotiations begin, but it is the absolute bare minimum required for an effective and efficient fire company. (pp. 45-46)

On-scene operations, critical tasking, and an effective emergency response force are the elements that aid in determining appropriate staffing levels, the number of companies needed, optimal deployment strategies, and the priority duties to be performed on the fire ground or emergency incident scene. A fire department must be able to determine what tasks need to be completed in order to have a positive influence on the outcome of an emergency incident, and the number of personnel and apparatus required to complete those tasks in an effective manner.

## On-Scene Operations

The variables of fire growth dynamics, along with property and life risks, combine to determine the fire ground tasks that must be accomplished, and to a certain extent the order in which they must be accomplished, to preserve life and mitigate loss. These tasks are interrelated but can be separated into two basic types: *life safety and fire control*.

Fire control tasks are those related to applying a fire suppression product, most generally water, on the fire, and removing the products of combustion from an enclosed environment. Life safety tasks are those related to finding trapped, disoriented or incapacitated victims and safely removing them from the building or shielding them from the hazard.

The key to any fire department's success at a fire incident includes a rapid response and efficient fire scene deployment, as well as adequate staffing and coordinated teamwork. These key elements are relevant regardless of whether the fire ground tasks are all fire-flow-related or a combination of fire flow and life safety.

## FIREFIGHTING RESOURCES

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Because of its greater potential for saving lives and limiting property damage, Colerain Fire & EMS utilizes aggressive offensive attacks whenever possible. The first objective is to put a hose line between any fire victims and the fire, and to rescue those victims by removing them from proximity to the hazard. The second objective is to contain the fire to the building of origin, floor of origin, or room of origin in that priority order, and to mitigate the Immediately Dangerous to Life or Health atmosphere.

### Critical Firefighting Tasks

Critical tasks are tasks that must be conducted in a timely manner by firefighters at building fire incidents in order to control the fire prior to flashover or to extinguish the fire in a timely manner. A fire department is responsible for assuring that responding companies are capable of performing all of the described tasks in a prompt and proficient manner.

The following is a brief description of single-family residential building fire scenario from a critical-tasking perspective:

- Size-up and radio report;
- Deploy a large diameter supply line from a fire hydrant to the pump apparatus;
- Provide for *Two-In Two-Out* compliance;
- Deploy a 150-foot or longer 1¾-inch pre-connected attack hose line to an entrance door;
- Deploy a 150-foot or longer 1¾-inch pre-connected *back-up* hose line to support the initial attack hose line;
- Initiate a primary search of the fire building;
- Secure building service utilities (e.g., electric, natural or propane gas);
- Initiate appropriate ventilation;
- Deploy ladders to at least two sides of building; and
- Establish a RAT.

According to retired Fire Chief Ronny Coleman,

The single-family dwelling scenario is pretty straightforward in its evaluation of what should happen in about the first 12-minutes of a working fire with several existing conditions, specifically no immediate danger to life and health, no immediate need to enter the building to perform a rescue, and an expectation that firefighters would take appropriate safety precautions. (2006, ¶ 19)

## **FIREFIGHTING RESOURCES**

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### **Establishment of an Effective Response Complement**

Once critical tasks have been identified and defined, an effective emergency response force can be established. This complement is defined as the number of personnel and amount of equipment that must reach an incident in a specific response zone within the maximum response time goal. An effective response complement must be trained and equipped to handle a variety of fire, rescue, special hazard and emergency medical incident, shortly after they are reported. In order to accomplish this, companies and units must be located close enough to the incident to arrive within the maximum prescribed response time for the full assignment of fire companies according to the risk level of the building, situation, or event.

The risk of fire, medical emergency, or other emergency event can never be held to zero. Thus, the objective of any standards of coverage study is to identify the balance among distribution, concentration, and response reliability that will keep hazard risk at an acceptable level, while maximizing the preservation of life, property, and the environment.

A minimum effective initial response compliment has been determined by the NFPA, based on fire flow capabilities; critical fire ground tasking, rapid emergency medical intervention, and adequate and capable special rescue and hazard mitigation functions

### **Colerain Fire & EMS Resource Allocation Based on Alarm Response**

Since the mid 1990's, the Colerain Fire & EMS has utilized a tiered response system based on dispatch information so as to maximize manpower usage, reduce risk and provide the best service to the community. This tiered response allows our manpower to make adjustments and to ensure that the appropriate resources are allocated correctly based on past practices and run response analysis.

Many fire departments are concerned about the high number of false alarms originating from accidental or malicious fire alarm activations and the impact that responses to these incidents have on fire department resources. Several years ago, Colerain Fire & EMS, like many other fire departments reacted by implementing a reduced response protocol resulting in fewer firefighters and apparatus initially being dispatched to these incidents. This reduced response protocol also involves a combination of units responding with traffic and units responding with lights and sirens.

At the time of the Squirrelsnest Incident, the appropriate basic single family residential fire alarm activation response protocols for fire alarm activations, building fire incidents and second alarms are listed below:

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### *Recorded residential fire alarm*

The Colerain Fire & EMS response guidelines for a recorded fire alarm activation (one which is manually, mechanically or electronically activated) is as follows:

- 1 – Closest engine company responds Code 3 (with warning lights and sirens)
- 1 – Second due engine company responds Code 2 (with traffic)
- 1 – Ladder company responds Code 2
- 1 – Battalion Chief - command officer responds Code 2

### *Dispatched residential building fire*

All building fire incidents in which the emergency communications center telecommunicator receives information that would suggest an actual fire or life safety situation occurring within a residential building. All responding units in this instance are dispatched accordingly and respond Code 3 to the scene.

- 2 – Engine companies
- 1 – Third due engine company – RAT team designation
- 1 – Ladder company
- 1 – Heavy rescue company
- 1 – ALS transport ambulance
- 1 – Battalion Chief - command officer
- IMAT response request – Additional staff and command officers

### *Second alarm assignment*

Situations that may require additional manpower and resources above and beyond those resources already dedicated to the emergency may require the IC to request an additional alarm assignment.

- 3 – Engine companies
- 1 – Ladder company
- 1 – Heavy rescue company
- IMAT response request – Additional staff and command officers
- Recall of off duty Colerain Fire & EMS personnel

## FIREFIGHTING RESOURCES

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**FINDING #9.1:** Staffing levels on each Colerain Fire & EMS unit provided a satisfactory number of human resources to effectively perform fire suppression operations.

Based upon the original dispatch information, the initial response complement consisted of two engine companies, one ladder company and one battalion chief: which is consistent with the Colerain Fire & EMS established response guidelines as listed above. As additional information was received and transmitted to the responding companies, the upgraded first alarm complement staffing levels provided the following number of personnel per company or unit:

<i>Company</i>	<b>E102</b>	<b>E109</b>	<b>E25</b>	<b>L25</b>	<b>R26</b>	<b>S25</b>	<b>D25</b>	<i>Total</i>
<i>Staffing</i>	4	4	4	4	2	2	1	21

NFPA 1710 identifies the initial assembly of a firefighting force as a minimum of seventeen qualified firefighters based on a 2,000 square foot, two story, single family occupancy without a basement, and with no exposures. This amount of resources is required to achieve the following initial activities:

- Establish a primary water source;
- Deploy an initial attack and back up hose line;
- Ventilate the building;
- Gain forcible entry into the building;
- Perform search and rescue;
- Provide for an IC; and
- Establish an initial rapid intervention crew (IRIC) to meet OSHA requirements (two-in/two-out).

Additional staffing is required above that level to accomplish other critical tactical priorities such as:

- Placing ladders;
- Controlling utilities;
- Providing emergency medical services for the responders and civilians;
- Placing additional hose lines in service;
- Handling multiple victims;
- Providing for a safety officer(s); and
- Providing for incident command support.

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Local government officials and fire department leaders must be mindful that when determining staffing levels, it has been demonstrated that when staffing levels fall below four firefighters per company, critical firefighting tasks are not executed effectively or efficiently. Tests conducted by the Dallas, Texas Fire Department in the middle 1980's indicated that staffing below a company size of four can overburden firefighting forces and potentially lead to greater losses. Likewise, NFPA 1710: *Standard for the Organizations and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* notes that engine companies and ladder companies each "shall be staffed with a minimum of four on-duty personnel" (NFPA, 2001, p. 1710-8).

**RECOMMENDATION #9.1a:** A comprehensive review of Colerain Fire & EMS response policies and guidelines was recommended to the Colerain Fire & EMS Administration in order to evaluate the effectiveness of the current policies and procedures.

Shortly after the Investigative Committee convened, it quickly became evident that a thorough analysis of our response guidelines was in order. The Committee was especially interested in evaluating the adequacy of the manpower and staffing of our units in response to a one-alarm single-family residential building fire assignment. As was mentioned earlier, history has proven time and time again, that firefighting is a business of numbers: The more resources and manpower that can be placed on the scene of an emergency in the beginning phases of operations, the safer and more effective the operations become.

The practice of dispatching extra companies to a fire on the first alarm assignment is called front-loading. It soon became apparent, when looking at our existing response practices and comparing them with required critical task priorities, that additional consideration should be given to exceeding NFPA's suggested staffing for a one-alarm fire.

While the Investigative Committee determined that the resources allocated to the Squirrelsnest Incident during the first alarm, was adequate in terms of staffing and manpower, the Administration decided to provide additional companies to the first alarm complement. Therefore, in June, 2009, the Colerain Fire & EMS adjusted the response complement for a one-alarm fire to include an additional engine and ladder company, making the full one-alarm complement to single-family residential building fires:

- 3 – Engine companies
- 1 – Fourth due engine company – RAT team designation
- 2 – Ladder companies
- 1 – Heavy rescue company

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1 – ALS transport ambulance

1 – Battalion Chief - command officer

IMAT response request – Additional staff and command officers

**RECOMMENDATION #9.1b:** Consideration should be given to adding one additional engine company to dispatches for routine residential fire alarms in remote areas of the Township.

The current response complement of two engines, one ladder and one battalion chief officer for dispatched alarm drops has been deemed appropriate for the more densely populated areas of the Township based solely on proximity to the fire stations. However, Colerain Township also consists of large areas of remote and agricultural land that are only accessible by rural roadways and are considerable distances to the closest fire stations. Therefore it is the recommendation of the Investigative Committee that consideration be given to adding one additional engine company to dispatches in these remote areas, making the response complement for recorded fire alarms:

1 – Closest engine company responds Code 3 (with warning lights and sirens)

2 – Second and third due engine companies respond Code 2 (with the flow of traffic)

1 – Ladder company responds (Code 2 response)

1 – Battalion Chief - command officer responds (Code 2 response)

In situations where an incident is upgraded from an alarm activation response to a building fire response, this additional engine company would be considered as part of the first alarm complement, thus bringing the total engine company responses as indicated in Recommendation #9.1a.

**RECOMMENDATION #9.1c:** Consideration should be given to adding one additional ladder company to dispatches for suspected or confirmed building fires.

Due to the importance of timely and efficient ladder-company work (search and rescue, utility control, ventilation and ladder access) the Colerain Fire and EMS has added one additional ladder company to its first alarm response complement to dispatches for building fires. This additional ladder company provides additional personnel and resources to accomplish these important life safety and support tasks. The Colerain Fire & EMS has already initiated this change with the Hamilton County Communications Center and the neighboring fire departments it relies on for mutual-aid to provide the additional ladder company.

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***FINDING #9.2:*** A designated RAT was assigned to the initial first alarm complement.

Assigning a designated RAT company to the initial response is essential to providing the necessary search and rescue efforts in the event of a Mayday. The initial staffing that provides for the two-in-two-out rule cannot possibly cover the responsibilities of a designated RAT company. Since it seems the majority of RAT activations occur within a relatively short period of time after first units arrive on scene, it is imperative that the RAT companies also arrive on scene as part of the initial response complement.

The company assigned to RAT duties at the Squirrelsnest Incident was E25. While E25 was not part of the initial fire alarm response, they were included in the upgraded dispatch of a structure fire at 06:22:41. On their arrival at 06:30:58, the E25 FAO was assigned to accountability position and the remaining team members were to function as a RAT crew. At 06:34:10 the IC advised the RAT to prepare for RAT functions. This notification came approximately just five-minutes after the E102 attack team entered the building. This clearly demonstrates the necessity of having a RAT team on scene and ready to react within minutes of the first arriving units.

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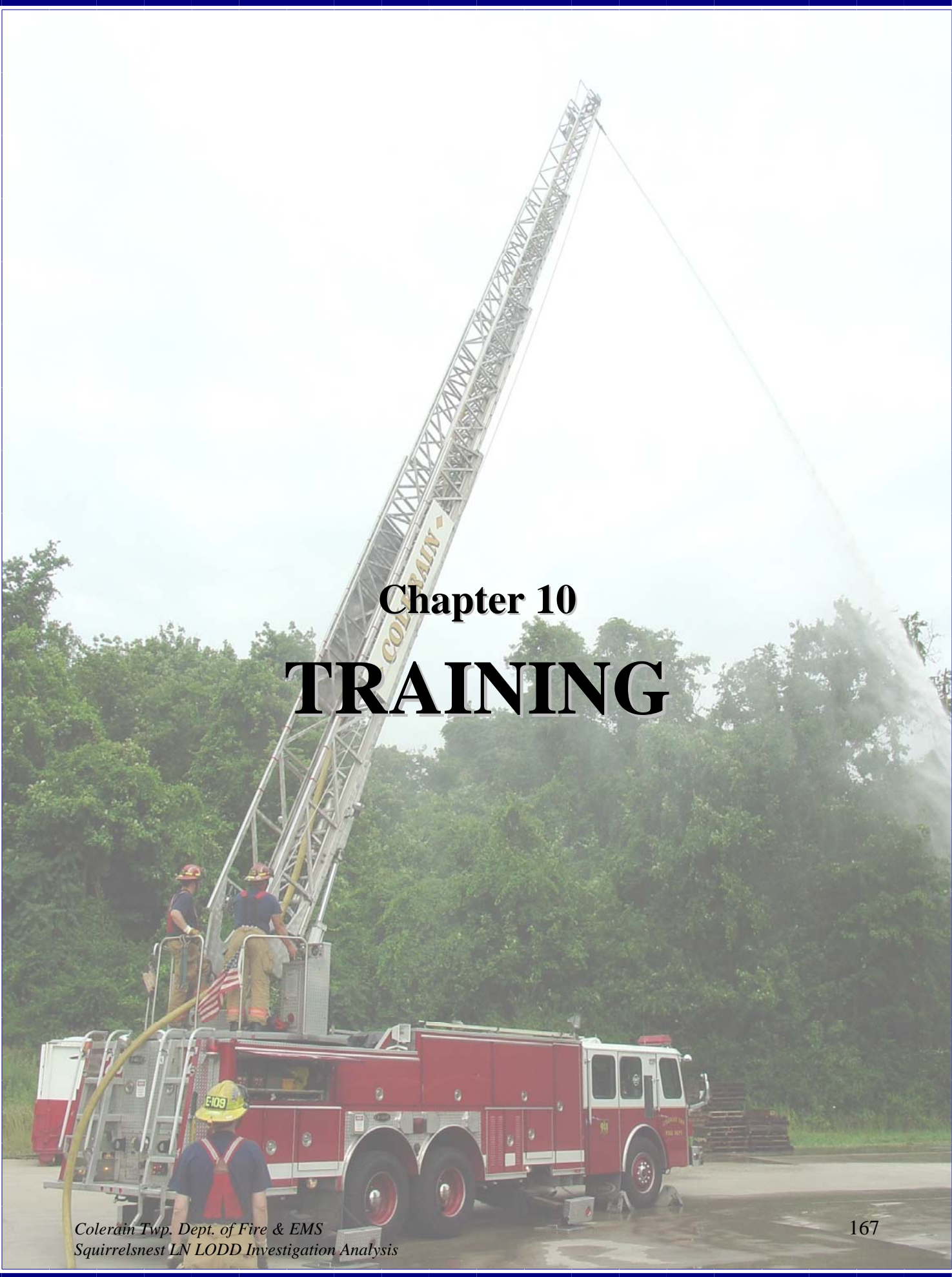
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## **FIREFIGHTING RESOURCES**

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# Chapter 10 TRAINING



## TRAINING

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### Overview

Colerain Fire & EMS's Training Division is an *Ohio Department of Public Safety Fire Chartered Institution* as well as an *Emergency Medical Services Continuing Education Provider* institution affiliated with Cincinnati State Technical College. Personnel of the Training Division strive to deliver the highest quality training, instruction and evaluation to its personnel. The division also oversees and coordinates the various aspects of the department's Safety Program. Colerain Fire & EMS benefits from a very proactive training philosophy. Theory-based programs are followed by hands-on practical applications. The Training Division conducts scheduled training for a vast variety of subject matter that is dynamic and ever changing. Areas of training provided include, but are not limited to:

- Basic and Advanced Fire Ground Operations (Strategies and Tactics);
- Incident Management (Incident Command and National Incident Management System);
- Fire Officer and Leadership Development;
- Driver Operator Certification;
- Fire Apparatus Operations (Pump and Aerial Ladder);
- Emergency Medical Services;
- Hazardous Materials;
- Technical Rescue and Special Operations; and
- Mandatory curricula, certifications and re-certifications.

Colerain Fire & EMS's Training Division offices are located at 11865 Colerain Avenue (Figure 40) in the northernmost section of Colerain Township. The Division is administered by one career and one part-time Division Chief, one part-time Lieutenant, and one part-time Administrative Assistant. Training programs, drills and various other educational endeavors are coordinated and taught by other department personnel with specialized focus in the particular subject matter.

*Figure 40: Training Division Offices.*



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In addition to the administrative facility, the Division also operates and oversees the Colerain Fire & EMS Training Tower and Burn Facility centrally located at 4300 Springdale Road (Figure 41). The facility is a multi-use, non-gas-fueled live fire training building with capabilities to simulate interior structural firefighting, high angle rescue, firefighter disorientation, interior search and rescue and high-rise building operations among others. The remaining area surrounding the training site is a poured concrete pad with various other training props and capabilities including vehicle fires, auto extrication, roof ventilation operations simulator, and driver's training courses.

Colerain firefighters are required to attend a minimum of 48-hours per year of on-shift drills as well as two live-burns (although most personnel far exceed this minimum requirement). An additional 24-hours of emergency medical training is also required for all emergency medical technicians (Basic and paramedic). Daily, weekly and monthly training programs are conducted by a combination of on-shift personnel, specialized instructors and outside subject matter experts. All training and instruction is provided according to established protocols and with NFPA standards in mind by one of the many state of Ohio Instructors on staff.

*Figure 41: Fire Training Tower and Live Burn Facility.*



Shift drills are conducted daily at all fire stations by officers and certified firefighting and emergency medical instructors. These drills consist of daily *Close-Call* review, shift briefings and preplan reviews in addition to a selected training topic. Practical performance drills reinforce those topics reviewed during classroom sessions. Typical shift drills occupy approximately two-hours per shift for all personnel. This proactive program was responsible for over 12,000 training hours provided to the men and women of Colerain Fire & EMS in 2007.

The Training Division is also responsible for the training and education of an annual firefighter recruit class. Candidates completing Colerain Fire & EMS recruit classes are eligible for certification to the Firefighter I and II levels as well as provided opportunities to convert their training into credit towards an associate degree in *Fire Service Technology* at the Cincinnati State Technical and Community College.

During recruit class, new Colerain Fire & EMS firefighters are instructed in the basic firefighter competencies of engine and ladder company operations, personal

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protective equipment usage, firefighter survival and rescue operations, as well as many other areas of basic firefighting; on-shift or in-service training they are afforded continued and advanced training in the aforementioned areas in addition to hazardous materials mitigation and technical rescue.

Once the fire recruit completes fire and emergency medical training, he or she is assigned a shift or unit-day, and enters an orientation program that was established to help the new employee in acclimating themselves to the fire and emergency medical duties and responsibilities at Colerain. It was recognized long ago that orientation could no longer be left to the *big-brother* type of orientation that was so commonplace in the years past. The goal is to ensure that our firefighters and emergency medical technicians exceed even the most demanding fire and medical standards. The program is intended to offer the new employee every opportunity to learn their trade at a comfortable pace. It is not designed to push anyone through for the sole purpose of getting another person on the streets.

This program is based on objective evaluations from preceptors, and skills obtained while *in the field*. After a review of the evaluations, and the skill sheets, a recommendation is made to the orientation program administrator for the new firefighter's clearance.

Since 1984, the Colerain Fire & EMS Training Division has successfully provided recruit training and instruction to several hundred men and women, most of whom become Colerain firefighters after graduation.

### Training Record Evaluation

#### Captain Robin Broxterman

Captain Broxterman was certified as a firefighter in the state of Ohio on December 20, 1990. She had approximately 17-years and three-months of firefighting experience and had completed the following certifications and courses:

- State of Ohio: Firefighter Level I & II Firefighter;
- State of Ohio: Emergency Medical Technician - Paramedic;
- State of Ohio: Firefighting and Emergency Medical Instructor;
- State of Ohio: Fire Safety Inspector;
- Basic Emergency Rescue Technician; and
- National Incident Management System (NIMS):
  - *IS-700 NIMS an Introduction;*
  - *IS-800 National Response Plan, an Introduction;*
  - *IS-100 Introduction to the Incident Command System (ICS100); and*

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- *IS-200 ICS for Single Resources and Initial Action Incidents.*

Prior to Capt. Broxterman's full-time employment with Colerain Fire & EMS she was employed at the U.S. Department of Energy's Fernald Facility Fire Department. During her employment at the Fernald Facility, she received extensive training in fire protection and occupational safety and health. Throughout her tenure with Colerain Fire & EMS, she attended numerous training and education programs related to fire officer development, emergency incident management and fire ground command, fire suppression operations, hazardous materials mitigation and technical rescue. In addition, Capt. Broxterman was in the final stages of completing the *Fire and Safety Engineering Technology*, Bachelor of Science degree program at the University of Cincinnati. Finally, she was in good standing with Colerain's training requirements.

### Firefighter Brian Schira

Firefighter Schira was certified as a firefighter in the state of Ohio on September 18, 2004. He had approximately three-years and seven-months of firefighting experience and had completed the following training certifications and courses:

- State of Ohio: Firefighter Level I & II Firefighter;
- State of Ohio: Emergency Medical Technician - Basic;
- National Incident Management System (NIMS):
  - *IS-700 NIMS an Introduction*
  - *IS-800 National Response Plan, an Introduction;*
  - *IS-100 Introduction to the Incident Command System (ICS100);* and
  - *IS-200 ICS for Single Resources and Initial Action Incidents;* and
- Hazardous Material Operations Level First Responder.

Firefighter Schira had been employed part-time by another Cincinnati-area fire department prior to his employment with Colerain Fire & EMS. He had successfully completed Colerain's Fire and EMS Orientation Program on March 10, 2008, and was in good standing with Colerain's training requirements.

### District 25 - Incident Commander

The initial IC had documented basic firefighting training dating back to May 1980, but was certified as a Level I & II firefighter in the state of Ohio on November 3, 1989. He was promoted to Battalion Chief in 2004, and has in excess of 28-years of firefighting experience and had completed the following certifications and courses:

- State of Ohio: Firefighter Level I & II Firefighter;
- State of Ohio: Emergency Medical Technician - Paramedic;
- State of Ohio: Firefighting Instructor;

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- State of Ohio: Fire Safety Inspector;
- Basic Emergency Rescue Technician; and
- National Incident Management System (NIMS):
  - *IS-700 NIMS an Introduction;*
  - *IS-800 National Response Plan, an Introduction;*
  - *IS-100 Introduction to the Incident Command System (ICS100);* and
  - *IS-200 ICS for Single Resources and Initial Action Incidents.*

During his employment with Colerain Fire & EMS, he had attended numerous training and education programs related to fire officer development, emergency incident management and fire ground command, fire suppression operations, hazardous materials mitigation and technical rescue. In addition, he is a graduate of the *Ohio Fire Executive Program* and a member of Ohio Task Force One and the Hamilton County Urban Search and Rescue Teams. Finally, he was in good standing with Colerain's training requirements at the time of incident.

### Findings, Discussions and Recommendations

**FINDING #10.1:** The review of training records indicated that the three aforementioned personnel had received the appropriate position and ancillary training necessary for their particular assignments at the fire incident.

**FINDING #10.2:** All command and line personnel involved with the incident had both positional training and functional experience. No training gaps were noted.

**FINDING #10.3:** The actions of Capt. Broxterman and Ffr. Schira when they realized they were in distress are not known; however, they did not appear to have initiated emergency procedures that could have improved their chances of survival or made other firefighters aware of their distress.

While there was no supporting evidence to the contrary, there certainly was no evidence available to suggest that Capt. Broxterman and Ffr. Schira attempted to follow the hose line out of the building once they encountered problems at the stairwell. The actions of the two firefighters may have been impaired by heat stress or injury, which is likely to have caused confusion and interfered with motor skills. Further supporting the possibility that they had become disoriented is the fact that their bodies were discovered in the basement directly below the family room as their route of travel upon entering the building was through the front entry door and down the hallway to the basement stairway. The investigative committee could find no evidence that the hose line had advanced or crept into the family room area on the first floor. Therefore there was no clear reason for the two firefighters to be in that area of the floor. Had they followed the hose line out of the building, they would have been taken directly back out into the front

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of the residence. Following a hose line from a smoke filled building when a firefighter is in distress or disoriented is a core fundamental technique that has been instructed to recruit-level firefighters for many years. The *Essentials of Firefighting and Fire Department Operations, 5th Edition* textbook states that, "Following a hose line will lead you ...to an exit ..." (2008, p. 320). In addition, there was no evidence, that after several apparent unsuccessful attempts by Capt. Broxterman to notify the IC of their distress by portable radio transmission did she or Ffr. Schira activate their PASS devices or depress the emergency activation button on the top of the radio.

**RECOMMENDATION #10.3:** Fire departments should provide continual firefighter survival training that simulates realistic and safe scenarios that prepare firefighters for critical situations.

No matter how careful firefighters are, fire incidents are at times, unpredictable and conditions can deteriorate rapidly. Firefighter survival training should be a major component of any fire department training program. Self extrication, emergency evacuation and situational awareness should be regularly reinforced, reviewed and practiced.

Firefighters must be conditioned to address individual emergencies in a calm manner in order to make rational decisions. It is by means of repetitive training that firefighters can learn and be instilled with survival skills and concepts. Training should include: a) Mayday recognition and communications (radio transmissions and PASS device activation), b) breathing air management, c) building construction features and materials (wall breaching), d) emergency evacuation procedures (self extrication for various entrapments), and e) disorientation.

**FINDING #10.4:** The ineffective performance of initiating and engaging in ladder company duties and responsibilities at the individual and company level critically compromised safety and fire control efforts.

As addressed in the *Firefighting Operations and Tactics* section of this report, there was repeated evidence that L25's interior and exterior teams were ineffective in fulfilling their ladder company duties and responsibilities.

**RECOMMENDATION #10.4a:** Fire departments should consider the establishment of minimum standards of performance for fire and rescue companies to maintain the proficiency of fire companies by establishing a program for the annual evaluation of company level skills.

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**RECOMMENDATION #10.4b:** For fire departments that do not have specific or specialized position assignments, they should incorporate functional and position company-specific training programs and apparatus assignments.

The very nature of operating a full service combination department poses several challenges in terms of station assignments and crew integrity. The current practice (in April, 2008) was to assign part time personnel to stations based on their qualifications and station needs at the time. This meant that personnel may have not been assigned to the same station as they had been on previous shifts. It would not be uncommon to change stations practically every shift. Career station assignments were only slightly better. Career personnel were typically rotated between stations on an annual basis.

Therefore, due to the manner in which the departmental needs were filled, it had become impractical to have dedicated teams assigned to function-specific apparatus such as L25 or R26. Many times the personnel assigned to these units are comprised of one career apparatus operator supplemented with part-time officers and personnel. As a result, all personnel on the department have the potential to be assigned as part of a ladder company one shift, and an engine company the next (and possibly the rescue company on the next shift). It is imperative in a system such as this, that the training programs reinforce company-specific tasks and functions, e.g. utility control and ventilations practices for ladder company operations and hose line advancement and attack principles for engine companies.

**FINDING #10.5:** RATs conducted firefighter rescue duties and responsibilities in a decisive and deliberate manner as anticipated under intensely difficult circumstances.

Colerain Fire & EMS has a history of providing all its personnel with comprehensive RAT training. The department adopted the program in 2002. All firefighting personnel are initially trained in firefighter survival, RAT concepts and procedures, and again yearly with RAT refresher classes. A RAT company is dispatched to all reported and confirmed building fire incidents. This incident provided a remarkable demonstration of how labor intensive RAT operations can be and that simply one RAT company may not be enough.

The first RAT companies (E25 - four firefighters and R26 - two firefighters) entered the building at 06:42:01 and began searching from E102 interior team's last known position. As they proceeded, they encountered E26 (four personnel) at 07:00:27 during their interior search and gave them a quick briefing of conditions and their findings. The second search team (E26) continued their search and progressed into the basement where they located the body of Capt. Broxterman at 07:08:19. They continued searching in the area and found Ffr. Schira at 07:29:41.

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The assigned RAT companies at this incident performed as they had been trained and encountered extremely dangerous conditions in their attempt to locate their fallen co-workers. These RAT companies should be commended on their efforts and persistence in the performance of their duties. It should be further noted that during firefighter survival training, instructors strive to make every training scenario have a positive outcome. During training, every firefighter is rescued every time. However, this incident demonstrated that although the job performance of the RAT companies was exemplary, they were unable to locate and rescue viable victims. This should NOT be viewed as an unsuccessful attempt or a reason to discontinue RAT training.

**FINDING #10.6:** Coordinated fire ground efforts could have been enhanced if standard operating guidelines planning, communication guidelines and procedures (such as radio frequency or channel selection), and prior training had taken place among mutual-aid departments.

During this incident, it demonstrated a fundamental weakness in some of the Colerain Fire & EMS's mutual-aid capabilities. The second alarm assignment included units from four other fire department agencies. Of these agencies, only one had been utilized in an automatic aid program instituted with Colerain Township in the fall of 2004. The remaining three agencies had very little experience responding into Colerain Township, although all three agencies border the Township. Compounding the already confusing situation, two of the outside agencies are located in adjoining Butler County and utilize a separate radio and communication system.

**RECOMMENDATION #10.6a:** Fire departments should collaborate with surrounding mutual-aid fire departments by conducting regular meetings to discuss management, command and control, planning, and provide periodic joint training opportunities.

**RECOMMENDATION #10.6b:** Fire departments should review, revise where appropriate, implement, and enforce written standard operating guidelines that specifically address incident management duties, emergency evacuation guidelines and procedures, personnel account ability, RATs and mutual-aid operations at emergency incidents.

**RECOMMENDATION #10.6c:** Fire departments should train on the standard operating guidelines, incident management, and downed or lost firefighter procedures with mutual - aid departments to establish interagency knowledge of equipment, guidelines and procedures, and capabilities.

Mutual-aid fire departments should train together and not wait until an incident occurs to attempt to incorporate the participating departments into a functional team. The impact of differences in equipment, operation philosophies, and operating guidelines

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must be identified and resolved before an emergency incident occurs. Standard Operating Guidelines that are mutually developed, and have the support of the majority of participating departments, will greatly enhance overall safety and efficiency at emergency incident scenes. Once methods and guidelines are agreed upon, training or instructional outlines must be developed and joint-training sessions conducted periodically to relay appropriate information to all affected department members.

**FINDING #10.7:** The initial and subsequent Incident Commanders maintained their composure and focus throughout the entire incident. Their demeanor ensured that the scene didn't deteriorate into chaos and disarray.

During this incident, the initial IC did an excellent job of maintaining his composure and focus despite knowing that two firefighters were likely lost or trapped. The subsequent IC is to be also commended for his display of leadership and direction as well. Without the composure and focus exhibited by the ICs, this incident could have had a very much more devastating outcome. These exhibited behaviors can only be contributed to knowledge, skills and abilities as a result of years of experience and training.

**RECOMMENDATION #10.7:** In terms of training, it is imperative that fire departments regularly evaluate the performance of command and line personnel (company and acting company officers) through the use of interactive simulations that focus on duties and responsibilities of those personnel that are assigned incident management organizational positions.

If one examines the various ways we have of learning, then reading appears to be at the bottom of the list. The information can be difficult to absorb and understand, and retention tends to be short lived. Listening to a lecture appears to be far down on the list, almost as low as reading. Watching something being done, live or on video is a little more effective – best if it is live. At the top of the list, when a trainee participates in an activity to be learned, absorption is faster, more complete and more concentrated, and retention is much greater.

Meanwhile, there is another, simulated form of participation that can be conducted in a class room, a workshop or training session. Role playing or simulation scenarios have been found to be very effective. Such simulated participation should be used in the training of acting company and company officers and command officers.

Colerain Fire & EMS's Training Division has quite an extensive Incident Command Simulator located within their administrative office complex. The Incident Command simulator is designed to provide realistic simulated incident practical evaluations to company level officers as well as ICs and those individuals learning how

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to use the incident command system. The simulator utilizes six stations to represent responding sector, division or group positions as well as a simulated command *vehicle* position for the IC to participate. All positions are equipped with networked widescreen computer monitors and all communications equipment required for a simulated emergency multi-company incident.

During training workshops and routine reviews, role playing scenarios are an effective method of increasing awareness, enhancing participant analysis of field situations, and familiarizing participants with the roles, aims, perspectives and positions they may fulfill in the field.

While not directly participatory in the sense that they are real situations, they are participatory in their implementation, and provide considerable and valuable benefits in a training program.

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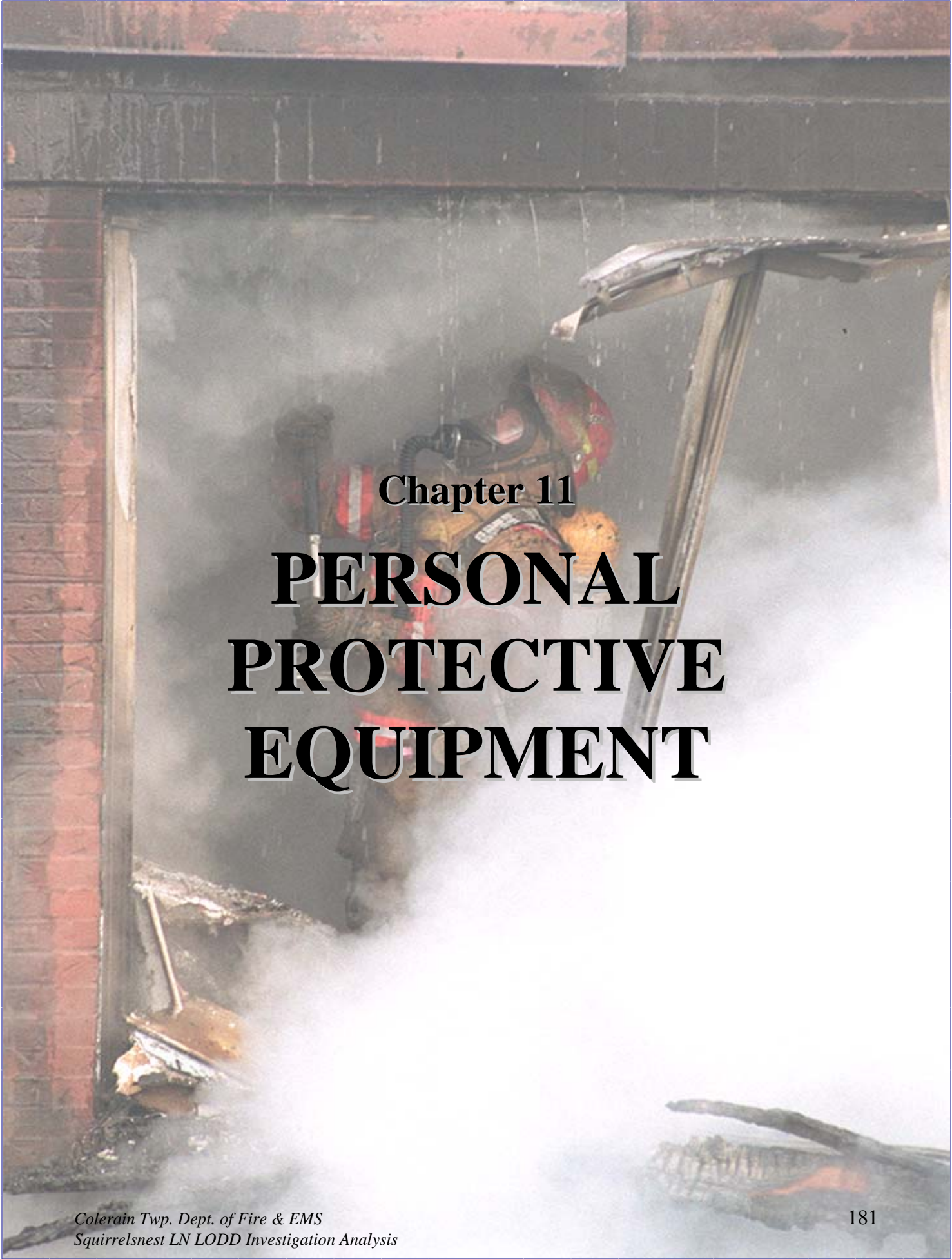
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Chapter 11

# PERSONAL PROTECTIVE EQUIPMENT



## PERSONAL PROTECTIVE EQUIPMENT

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Personal protective equipment is designed to perform several functions. Of these, body protection from heat and flames, is one of the most important. Firefighter protective equipment designs are based on years of field experience and research studies. Therefore, the firefighter's structural ensemble is designed to provide *limited* protection based primarily on the firefighter being exposed directly to flames from fully developed fires and where firefighters experience life threatening situations.

Colerain Fire & EMS issues all personnel a complete ensemble of personal protective clothing and assigns protective respiratory equipment for each firefighter assigned to a fire apparatus. The ensemble and equipment issued by Colerain Fire & EMS must meet or exceed the *NFPA 1500, Standard on Fire Department Occupational Safety and Health Program*, *NFPA 1971, Standard on Protective Ensembles for Structural Firefighting and Proximity Firefighting*, *NFPA 1851, Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*, *NFPA 1981, Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services*, state of Ohio Administrative Code (OAC), *Section 4123: 1-21-2, Personal Protective Clothing and Equipment for Structural Fire Fighting* and Colerain Fire & EMS specifications for structural firefighting.

Captain (Capt.) Broxterman was issued the following structural firefighting protective clothing items:

- Helmet: Morning Pride *Lite-Force Plus* helmet with goggles;
- Protective hood: Morning Pride ventilated 20/80 polybenzimidazole (PBI) / Lenzing;
- Coat: Morning Pride 7.5 oz. PBI Matrix tails outer shell, two layer Spunlace / Meta-Aramid facecloth thermal liner, Crosstech / Nomex facecloth moisture barrier;
- Trousers: Morning Pride 7.5 oz. PBI Matrix tails outer shell, two layer Spunlace / Meta-Aramid facecloth thermal liner, Crosstech / Nomex facecloth moisture barrier;
- Suspenders: Morning Pride *Dyna-Back*;
- Gloves: American Firewear *Super Glove* with gauntlet-style cuff; and
- Footwear: Haix *Fire Hunter*.

Firefighter (Ffr.) Schira was issued the following structural firefighting protective clothing items:

- Helmet: Morning Pride *Lite-Force Plus* helmet with goggles;
- Protective hood: Morning Pride ventilated 20/80 PBI / Lenzing;

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- Coat: Morning Pride 6 oz. PBI outer shell, Aralite / Nomex facecloth thermal liner, Crosstech / Nomex facecloth moisture barrier;
- Trousers: Morning Pride 6 oz. PBI outer shell, Aralite / Nomex facecloth thermal liner, Crosstech / Nomex facecloth moisture barrier;
- Suspenders: Lion *Night Hawk* Four-Way;
- Gloves: Morning Pride Elk outer shell, Crosstech moisture barrier, Nomex wristlet; and
- Footwear: Servus *Firebreaker Fighting Weight* bunker boot.

In 2006, the department established a protective clothing ensemble inspection program that was intended to reduce the safety risks and potential health hazards related to turnout gear care, maintenance and repair. The program was developed in accordance with NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program* and NFPA 1851, *Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Firefighting and Proximity Firefighting*. All personnel have a responsibility to inspect their assigned ensemble items on a regular basis. In addition, each employee's assigned ensemble is inspected *bi-annually* by four manufacturer trained fire department personnel that encompasses a thorough review of all items.

Colerain Fire & EMS provides respiratory protection equipment (self contained breathing apparatus [SCBA]) to its firefighters appropriate for the hazards of structural firefighting, rescue, and hazardous materials operations. A respiratory hazard may include, but not be limited to the following: excessive heat, oxygen deficient atmospheres, harmful dusts, fogs, fumes, mists, gases, smokes, sprays, and vapors. All personnel are administered physical assessments, provided with proper instruction on the use and basic maintenance of equipment, and are supervised in the use of respiratory equipment. In addition, SCBA equipment is maintained by three manufacturer certified repair technicians in accordance with manufacturer's recommendations and specifications.

Before a Colerain Fire & EMS firefighter can wear a SCBA in an environment that is immediately dangerous to life and health (IDLH), he or she must complete the following:

- Physical assessment that certifies that the firefighter meets the requirements of Occupational Safety and Health Administration (OSHA) 1910.156, 1910.134, 1910.120, and *NFPA 1582, Standard on Medical Requirements for Fire Fighters*;
- A quantitative fit test for each type of face piece or mask the firefighter may wear during the course of his or her employment as required by OSHA 29 CFR 1910.134 and OAC 4123- 21-07; and

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- Formal evaluation on normal and foreseeable uses of the respiratory protection equipment.

Annually (or as needed) all firefighters receive quantitative fit testing for his or her SCBA face piece and other respiratory protection equipment.

Colerain Fire & EMS utilizes the following protective respiratory equipment for structural firefighting:

- Mine Safety Appliance (MSA), *Firehawk*, Model 4500 with a 30-minute air supply cylinder (Figure 42);
- Air compressor and cascade system at Station 25;
- Air compressor and cascade system at Station 26; and
- Cascade system on R26.

It should be noted that 30-minutes refers to the theoretical amount of air supply in the air cylinder, however, this amount can be drastically reduced depending on many factors, any of which can exhaust the air supply much sooner. These factors include amount of physical exertion, an improper face piece seal, loose valve or hose connections, or activating the air bypass on the face piece regulator.

*Figure 42: Similar MSA Firehawk model SCBA utilized by Colerain Fire & EMS.*



Each SCBA is equipped with MSA's *Integrated Computer Module (ICM) 2000 Plus Integrated Personal Alert Safety System* (PASS) device. The ICM 2000 Plus is an all in one combination PASS and redundant alarm with a built in computer system that digitally displays SCBA performance information. The ICM 2000 Plus also provides a data logging and data downloading capability to retrieve up to 30-hours of SCBA usage information. The data provides information about the time of use, air consumption rate, ambient temperature and alarm activation.

The PASS device is designed to assist firefighters or rescuers in locating a downed or disoriented firefighter. The integrated PASS device is automatically activated. This means that once the SCBA air supply is turned "on", the PASS is automatically activated. Should a firefighter collapse or remain motionless for approximately 30-seconds, the PASS will emit a loud, pulsating shriek alarm signal. The alarm can also be sounded manually by the firefighter if he or she needs immediate assistance.

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In addition, each SCBA face piece is equipped with MSA's *Clear Command Communications System*, which is designed to provide a means of amplified communications amongst firefighters working in close proximity of one another and the transmission of information by means of the portable radio. It features an internally mounted microphone coupled with a large-diameter amplifier speaker for clarity and volume. The system delivers more than twice the volume of the face piece alone.

All pumping and ladder apparatus are assigned four to five SCBA's and a minimum of one spare air cylinder for each SCBA unit. Each firefighter reporting for shift duty is responsible for the inspection of their SCBA to insure that the equipment is ready for service. Fire apparatus operators are responsible for inspecting the SCBA on their apparatus that is not assigned to an individual firefighter. All SCBA face pieces, regulators, and associated components (PASS, low-air alarm, hoses) are flow tested and inspected annually by the fire department certified repair technicians.

In addition, Colerain Fire & EMS provides a minimum of four Motorola *Astro XTS 5000* 800 MHz portable radios for each firefighter assigned to each pumping and ladder apparatus (Figure 43). The radio is carried in a pocket specifically for the portable radio on the protective coat or in a leather radio pouch with a shoulder strap either worn over or under the turnout. Finally, four to five rechargeable flashlights are provided for firefighters on each pumping and ladder apparatus. The Streamlight *Fire Box* or *Fire Vulcan* is currently assigned to each riding position on apparatus (Figure 44).

*Figure 43: 800 MHz portable radio utilized by Colerain Fire & EMS.*



*Figure 44: Fire Box flashlight model utilized by Colerain Fire & EMS*



The protective clothing ensembles were evaluated by Colerain Fire & EMS post-incident committee personnel and Mr. Alan Schierenbeck, Vice President of Market Development for the Honeywell First Responder Products formerly Total Fire Group

## PERSONAL PROTECTIVE EQUIPMENT

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suppliers of a majority of the protective clothing ensemble items. Honeywell's *Damaged Protective Clothing Ensemble Analysis* may be reviewed in Appendix D.

Elements of the SCBA units utilized by the personnel assigned to E102 were evaluated by representatives and engineers of MSA and the National Institute for Occupational Safety and Health (NIOSH). The ICM's from Capt. Broxterman's and Ffr. Schira's were shipped to the manufacturer to attempt to recover data relevant to this incident. The SCBA worn by E102's surviving firefighter (Ffr. #2) was shipped to the NIOSH for evaluation with NIOSH respiratory protection regulations.

All items were returned to Colerain Fire & EMS and placed separately in double locked containers, and both containers were locked in a secure area.

### Findings, Discussions and Recommendations

***FINDING #11.1a:*** Evidence suggested that Captain Broxterman entered the building wearing partial firefighter protective clothing ensemble and equipment, including a helmet, coat, trousers, footwear, gloves, SCBA, and portable radio for fire ground communications.

The post-incident examination of Capt. Broxterman's protective clothing ensemble and its components revealed the following:

- The helmet showed signs of significant charring and the internal suspension partially consumed (Figures 45 and 46).

*Figure 45: The heavily charred helmet outer shell worn by Capt. Broxterman.*



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*Figure 46: The heavily charred helmet outer shell interior along with remnants of the suspension system.*



- No evidence of a protective hood was recovered when the SCBA face piece and coat were removed from Capt. Broxterman's body during autopsy. A protective hood was subsequently found on the officer's side floor of the apparatus cab, which was identified as to belonging to Capt. Broxterman by means of her badge number.
- There was near complete destruction of the coat. The coat showed signs of significant charring and degradation of all three layers (outer shell, moisture barrier, thermal lining) of considerable portions of the garment (Figures 47 and 48).

*Figure 47: Front view of coat worn by Capt. Broxterman.*



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*Figure 48: Rear of view of Broxterman's coat. Complete degradation back of coat. Note suspender hardware fused into lining material.*



- There was near complete destruction of the trousers. The trousers also showed signs of significant charring and degradation of all three layers of considerable portions of the garment (Figures 49 and 50).

*Figure 49: Front view of trousers worn by Capt. Broxterman.*



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*Figure 50: Seat and crotch area of Broxterman's trousers. Near complete degradation of rear and lower leg portions of the garment.*



- The investigation committee was unable to determine the status of Capt. Broxterman's issued protective gloves. The severity of the burn injuries to her left hand and wrist was far greater than the right-side. The thermal damage to both lower arm and cuff areas of the protective coat was extensive. There was photographic evidence of protective gloves discovered in the basement debris during the origin and cause investigation phase, but there was no indication that linked the gloves to Capt. Broxterman.
- The leather footwear outer material showed signs of significant carbonization and charring of the outer material and Kevlar lining system (Figures 51 and 52).

*Figure 51: Thermally damaged leather footwear worn by Capt. Broxterman.*



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*Figure 52: Significant full depth charring of the ankle and heel area.*



- The portable radio assigned to Capt. Broxterman sustained significant thermal damage completely destroying the radio and leather carrying case (Figure 53).

*Figure 53: Remnants of Capt. Broxterman's portable radio.*



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***FINDING #11.1b:*** Evidence suggested that Ffr. Schira likely entered the building wearing full firefighter protective clothing ensemble and equipment, including a helmet, protective hood, coat, trousers, boots, gloves, SCBA, and portable radio for fire ground communications.

The post-incident examination of Ffr. Schira's protective clothing ensemble and its components revealed the following:

- The helmet showed signs of significant charring and the internal suspension partially consumed (Figures 54 and 55).

*Figure 54: The heavily charred helmet outer shell worn by Ffr. Schira.*



*Figure 55: The heavily charred helmet outer shell interior along with remnants of the suspension system.*

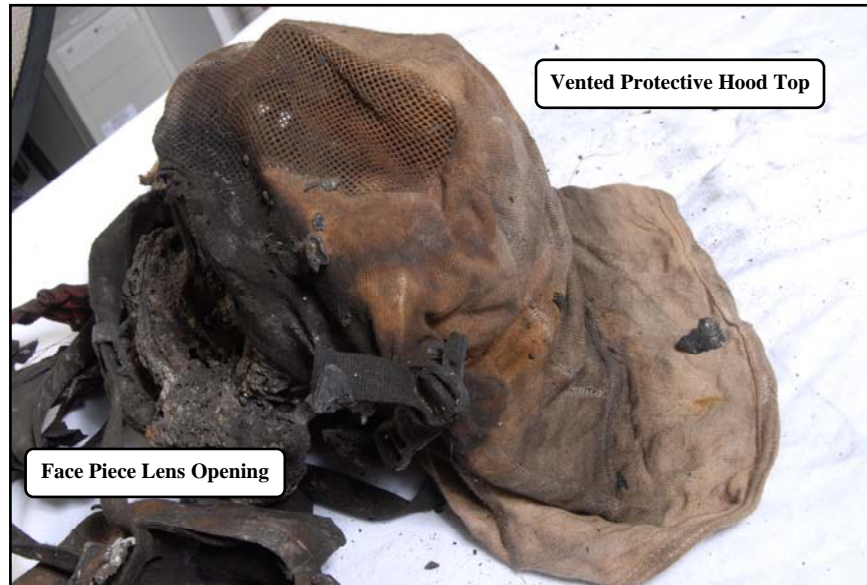


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- The protective hood remained intact following exposure to high heat conditions, but became fused at the point where the hood and SCBA face piece interfaced (Figure 56).

*Figure 56: Protective hood worn by Ffr. Schira.*



- The coat showed signs of significant charring and degradation of all three layers of considerable portions of the garment (Figures 57 and 58).

*Figure 57: Front view of coat worn by Ffr. Schira.*



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*Figure 58: Rear of view of Ffr. Schira's coat.*



- There was near complete thermal destruction of the trousers. The trousers also showed signs of significant charring and degradation of all three layers of the garment (Figures 59 and 60).

*Figure 59: Front view of trousers worn by Ffr. Schira.*



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*Figure 60: Rear view of trousers worn by Ffr. Schira.*



- The investigation committee was unable to determine the status of Ffr. Schira's issued protective gloves. The severity of the burn injuries to his hands and wrists and the thermal damage to both lower arm and cuff areas of the protective coat was extensive. There was photographic evidence of protective gloves discovered in the basement debris during the origin and cause investigation phase, but there was no indication that linked the gloves to Ffr. Schira.
- The rubber footwear outer material showed signs of significant carbonization and charring of the outer material and Kevlar/Nomex lining system (Figure 61).

*Figure 61: Thermally damaged rubber footwear worn by Ffr. Schira.*



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- The portable radio assigned to Ffr. Schira sustained significant thermal damage (Figure 62).

*Figure 62: Remnants of Ffr. Schira's portable radio.*



**RECOMMENDATION #11.1a:** Fire departments should reinforce proper donning and wearing of the protective clothing ensemble to include protective hood, helmet ear flaps and coat collar closure and gloves.

**RECOMMENDATION #11.1b:** Fire departments should continue to focus on and give consideration relevant to new developments to new personal protective ensemble technology and changes to NFPA performance standards and provide the most effective and reliable equipment available.

**FINDING #11.2:** Physical and photographic evidence indicated that Capt. Broxterman's SCBA was worn properly. Due to thermal damage sustained from exposure to heat and direct flame, no data from Capt. Broxterman's ICM was recoverable.

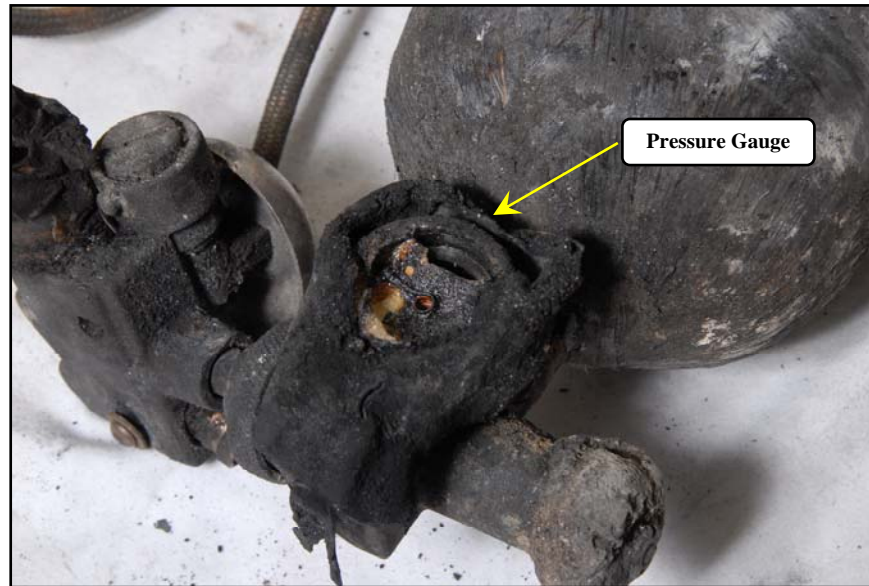
A post-incident examination of Capt. Broxterman's SCBA and its components revealed the following:

- When Capt. Broxterman's body was removed from the building, her SCBA face piece was in place with the mask-mounted regulator connected to the face piece.
- The air cylinder labeling was unreadable and the cylinder pressure gauge was too damaged to read due to thermal damage (Figure 63).

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*Figure 63: Capt. Broxterman's breathing air cylinder pressure gauge thermal damage.*



- The face piece assembly failed completely due to thermal damage (Figure 65).

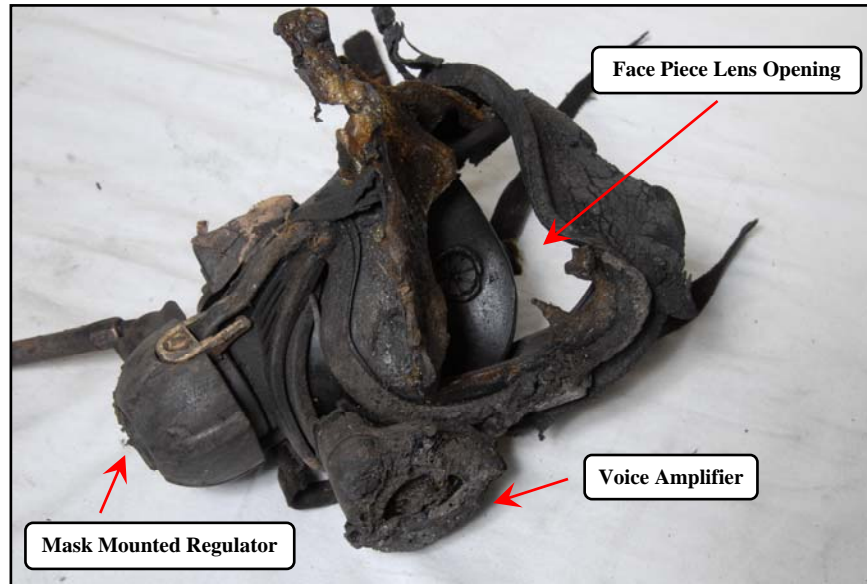
*Figure 64: Undamaged face piece assembly orientation.*



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*Figure 65: Captain Broxterman's thermally damaged face piece.*



- The SCBA ICM and PASS were completely destroyed as a result of thermal exposure (Figure 67).

*Figure 66: Undamaged SCBA ICM and PASS orientation.*



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*Figure 67: Captain Broxterman's thermally damaged ICM.*



- All hoses and tubes showed signs of significant thermal damage.
- The back frame and harness assembly were damaged to the point that they were partially consumed by the fire (Figure 68).

*Figure 68: Thermally damaged remnants of Capt. Broxterman's SCBA assembly.*



Capt. Broxterman's SCBA was not subjected to performance testing by NIOSH due to the severity of damage sustained to the equipment. The ICM was subsequently returned to MSA for an attempt to recover data relative to the SCBA's performance and the environment it was subjected to during the incident. MSA engineers attempted to use

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a reader-writer device to retrieve the data, but were unsuccessful. The Electrically Erasable Programmable Read Only Memory (EEPROM) Integrated Circuit (IC) chip, which is a type of memory chip that retains data when its power supply is switched off was removed from the printed circuit board (PCB). The EEPROM IC chip was then placed into a new PCB in an attempt to access the data. The engineer was unable to access and recover any data.

***FINDING #11.2b:*** Physical evidence indicated that Ffr. Schira's SCBA was worn properly.

A post-incident examination of Ffr. Schira's SCBA and its components revealed the following:

- When Ffr. Schira's body was removed from the building, his SCBA face piece was in place with the mask-mounted regulator connected to the face piece.
- The air cylinder pressure gauge was too thermally damaged to read (Figure 69).

*Figure 69: Ffr. Schira's breathing air cylinder pressure gauge thermal*

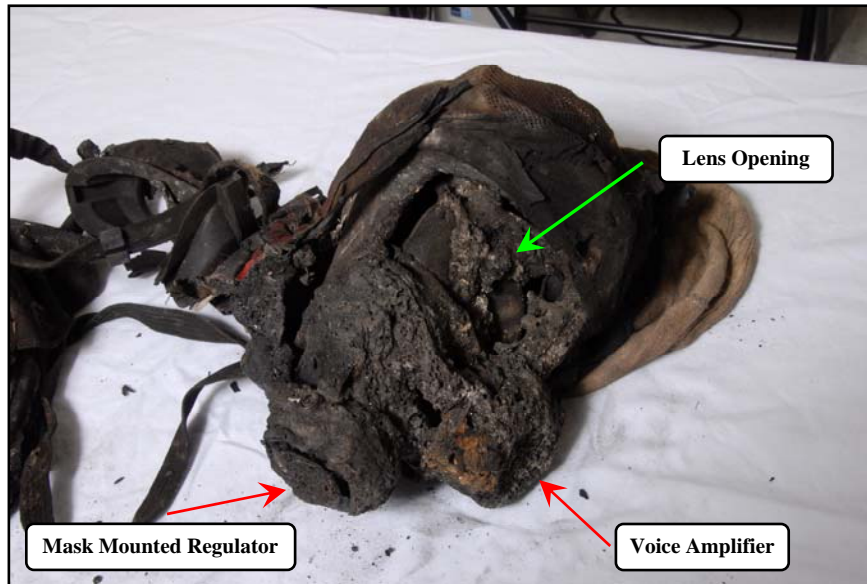


- The face piece assembly failed completely due to thermal damage (Figure 70).

## PERSONAL PROTECTIVE EQUIPMENT

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*Figure 70: Front view of Ffr. Schira's SCBA face piece. Helmet goggles and protective hood fused to face piece.*



- The SCBA ICM and PASS had indications of thermal and smoke exposure (Figure 71).

*Figure 71: Ffr. Schira's SCBA ICM and PASS.*



- All hoses and tubes had signs of thermal and smoke exposure. The hose that supplied the mask-mounted regulator had separated near the face piece as a result of thermal exposure.

## PERSONAL PROTECTIVE EQUIPMENT

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- The back frame and harness assembly showed signs of thermal and smoke exposure (Figure 72).

*Figure 72: Ffr. Schira's SCBA back frame and harness assembly.*



Ffr. Schira's SCBA was not subjected to performance testing by NIOSH due to the severity of damage sustained to the equipment. The ICM was subsequently returned to MSA for an attempt to download data relative to the SCBA's performance and the environment it was subjected to during the incident.

**FINDING #11.3:** Ffr. Schira's ICM 2000 Plus Integrated PASS device showed signs of thermal damage, but was still functional. The following data was recovered from the ICM by MSA representatives and engineers:

- The ICM internal clock displayed a time record beginning with 11:42 hours when the SCBA pack was pressurized for this incident which was not consistent with the timeframe of the incident.
- Data indicated the cylinder's pressure was approximately 4,100 pounds per square inch (psi) at the time the SCBA was pressurized. The SCBA cylinder is considered full at 4,500 psi.
- Data indicated the motion alarm activated approximately *10-minutes* after the SCBA was pressurized. The motion alarm sensor detects a prolonged lack of motion by a firefighter, generally indicating a problem with him or her, most often indicating the wearer is unconscious or otherwise incapacitated.
- Data indicated the low pressure alarm activated approximately *12-minutes* after the SCBA was pressurized.

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- Data indicated temperature at pressurization was approximately 60°F, and peaked 15-minutes after pressurization at approximately 190°F. Based on an independent analysis of Ffr. Schira's PPE, it is known he was exposed to ambient temperatures well in excess of 190°F.
- Data indicated a low battery warning activation two-hours and 40-minutes after the SCBA was pressurized.

The data log for this incident can be located in Appendix E.

**FINDING # 11.4:** Personnel reported that no audible alarm signals were heard from PASS devices.

During this incident, it was reported that no audible alarm signals were heard from the PASS devices worn by the two deceased firefighters by the rear sector officer, RATs or other operating fire companies following the collapse of the structural flooring system and during the subsequent search and rescue attempts.

It is theorized that either due to the positioning of the two downed firefighters (one on top of the other) or the structural debris and contents that may have accumulated on top of the firefighters immediately following the collapse were *possibly* contributing factors to the inaudible or muffled signals. It is also theorized that heat and direct flame exposure *possibly* damaged Capt. Broxterman's ICM rendering the PASS device inaudible or not functional. As previously mentioned, the analysis of Ffr. Schira's indicated that the motion alarm activated approximately *10-minutes* after the SCBA was pressurized but no audible alert was heard on scene.

In December of 2005, an article released by the IAFC stated that,

Exposure to high temperature environments may cause the loudness of PASS alarm signals to be reduced. This reduction in loudness could cause the alarm signal to become indistinguishable from background noise at the incident scene. This problem was brought to the attention of the NFPA Technical Committee on Electronic Safety Equipment by the National Institute for Occupational Safety and Health's (NIOSH) Fire Fighter Fatality Investigation and Prevention Program.

NIOSH reported that during the investigation of four fire fighter fatalities that occurred from 2001 to 2004, the PASS alarms were not heard or were barely audible. The PASS had been certified as compliant to NFPA 1982, *Standard on Personal Alert Safety Systems (PASS)*, 1998 Edition, and involved both stand-alone PASS and SCBA-integrated PASS.

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Initial laboratory testing of PASS by the National Institute for Standards and Technology's (NIST) Fire Research Division has shown this sound reduction may begin to occur at temperatures as low as 300° F (150° C) and could affect all PASS. Additional work is required to better characterize the thermal conditions (temperatures and exposure durations) that contribute to alarm signal degradation. (IAFC, 2005, ¶ 1-3).

It should be noted that Ffr. Schira's PASS device alarm signal did begin sounding at the coroner's office prior to autopsy. As Neslon Bryner points out in the Bill Dedman article, *Flaws in Firefighters' Last Line of Defense* concerning deficiencies in PASS devices, researchers have observed that even though the sound level may deteriorate in high temperature environments, the sound level returns to normal as the device cools down.

**RECOMMENDATION #11.4:** Fire departments should continue to pay attention to and give consideration to new developments in new SCBA technology and changes to NFPA performance standards and provide the most effective and reliable equipment available.

**FINDING #11.5:** Face piece fit tests were conducted in accordance with NFPA 1852 and OSHA 29 CFR 1910.134.

- Capt. Broxterman was fit tested on June 12, 2007; and
- Ffr. Schira was fit tested on August 29, 2007.

Colerain Fire & EMS certified SCBA technicians conduct annual fit testing of all personnel once each calendar year.

**FINDING #11.6:** SCBA face piece, regulators, and all associated components were flow tested in accordance with manufacturer recommendations and specifications, NFPA ....

- Capt. Broxterman's SCBA (Serial # GYO47376) was flow tested on January 28, 2008, and passed all required test.
- Ffr. Schira's SCBA (Serial # GYO27435) was flow tested on January 28, 2008, and passed all required test.

**FINDING #11.7:** Ffr. #2's SCBA complied with NFPA 1981 and 42 CFR 84, SCBA Performance Requirements following an evaluation by NIOSH.

In December 2008, NIOSH received E102's Ffr. #2 SCBA for evaluation for compliance with NIOSH respiratory protection regulations. The SCBA was examined and evaluated by the National Personal Protective Technology Laboratory, located in Pittsburgh, Pennsylvania.

## PERSONAL PROTECTIVE EQUIPMENT

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The following performance tests were conducted on the SCBA:

- NIOSH SCBA Certification Test conducted to evaluate compliance with the performance requirements of 42 CFR 84:
  1. Positive Pressure Test;
  2. Rated Service Time Test (duration);
  3. Gas Flow Test;
  4. Exhalation Breathing Resistance Test;
  5. Static Face Piece Pressure Test; and
  6. Remaining Service Life Indicator Test (low-air alarm).
- NFPA Test conducted to evaluate compliance with the performance requirements of NFPA 1981:
  7. Air Flow Performance Test.

The SCBA met the requirements of all test except for the Positive Pressure Test. There was a very brief spike at the beginning of each inhalation stroke that went below zero. While it seemed unlikely that this could cause inward leakage of contaminants, particularly with a good face piece seal, it did not cause the unit to fail the test.

Upon completion of testing, the SCBA was returned to Colerain Fire & EMS, where it was cleaned, overhauled and returned to service. The complete NIOSH report relative to Ffr. #2's SCBA can be located in Appendix F.

## PERSONAL PROTECTIVE EQUIPMENT

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## **PERSONAL PROTECTIVE EQUIPMENT**

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### **REFERENCES**

IAFC (December 6, 2005). PASS alarm signals can fail at high temperatures. Retrieved from <http://www.iafc.org/displayindustryarticle.cfm?articlenbr=28745>

## PERSONAL PROTECTIVE EQUIPMENT

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A low-angle photograph of a firefighter in full gear climbing a long, silver metal ladder. The ladder is extended from the back of a red fire truck. In the background, a red building with a white sign featuring the letters 'HRU' and a yellow arrow is visible. The sky is clear and blue.

## Chapter 12

# FIREFIGHTING APPARATUS AND EQUIPMENT



# FIREFIGHTING APPARATUS AND EQUIPMENT

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## Overview

Having quality firefighting apparatus and equipment is just as critical as having trained command and firefighting personnel. Colerain Fire & EMS has recognized this need and has reacted responsibly by providing and maintaining its physical capital in a manner that assures the citizenry and visitors that when it's pressed into service, under adverse conditions for long periods of time, they will perform without hesitation.

The pumping apparatus also known as an engine is the basic firefighting unit of Colerain Fire & EMS. Every pumping apparatus utilized by the fire department meets or exceeds the NFPA 1901, *Standard for Automotive Fire Apparatus* in pump size, tank size, hose complement and equipment carried. NFPA 1901 standard defines the requirements for new automotive fire apparatus designed to be used under emergency conditions to transport personnel and equipment and to support the suppression of fires and mitigation of other hazardous situations. These apparatus have been designed to meet capabilities in the urban and suburban environment. NFPA focuses broadly on the safety and performance of apparatus.

Pumping apparatus are also equipped to meet the requirements of ISO. As addressed in Chapter One, ISO measures the major elements of a community's fire suppression system including the fire equipment used to provide fire protection. ISO reviews the distribution of fire companies throughout Colerain's response area and checks that the fire department service tests its pumps and aerial ladders regularly. In addition, ISO reviews the equipment inventories assigned to each pumping (e.g., nozzles, hose, SCBA, etc.) and aerial ladder apparatus (e.g., ladders, cutting and prying tools, SCBA, etc). ISO focuses specifically on the fire suppression capabilities of the apparatus.

This section addresses the first-due pumping apparatus and equipment *relevant* to this incident and not covered in other sections of this report.

## Apparatus

During this incident, the personnel assigned to E102 were operating from a *reserve* pumping apparatus. The 1984 Ford Emergency One is a 1,000 gallons per minute (gpm) pumping apparatus with a 500-gallon capacity *on-board* water tank (Figure 73). The apparatus is one of two reserve pumping apparatus in the department's vehicle fleet.

*Figure 73: Reserve engine assigned to E102 on April 4, 2008.*



## **FIREFIGHTING APPARATUS AND EQUIPMENT**

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The vehicle is assigned radio identifier Engine 226 and a department vehicle number of Unit 208. The vehicle is assigned to Station 103. As units are reassigned from a reserve to front-line status, the department changes their radio designator number to correspond to the station that they respond from (i.e., E102 was taken out of service, the reserve unit that replaced it assumed the radio designator E102.)

The internal configuration of the cab is standard for the *cab-over* two-door commercial chassis, two bucket seats in the front divided by a self contained breathing apparatus and its mounting bracket on a pedestal. The rear of the cab is partially covered with a canopy and is configured with a bench seat that has a seating capacity for two firefighters. Because of its cab design and configuration, it is primarily utilized as a training apparatus, but is maintained and tested as any other pumping apparatus in the department's fleet. It is placed into front-line service only if the other reserve pumper is in-service as a front-line vehicle or unavailable for use, which was the circumstance on the date of this incident.

The apparatus is also equipped with a Class A foam concentrate proportioning system that supplies foam to the two 1¾-inch pre-connected cross-lay attack lines. In addition, the apparatus has a portable 2500-watt gasoline powered generator for supplying electric power to two electric outlets and two 500-watt quartz scene lights, which is typically activated after initial attack lines are deployed and the supply line is connected to the pump intake.

### **Firefighting Equipment**

Colerain Fire & EMS pumping apparatus are multi-purpose vehicles carrying equipment for a wide range of fire-fighting, emergency medical and rescue tasks. Therefore, pumping apparatus carry *standardized* equipment such as hose, ladders, pike poles, axes and cutting equipment, prying bars, fire extinguishers, ventilating equipment, floodlights, water appliances and adapters, breathing apparatus and general tools.

#### E226 Pre-connected Attack Hose Lines

- Two pre-connected cross-lays, 1¾-inch, synthetic cloth covered, double jacket, 150-foot in length with 50 to 350 gpm automatic fog nozzles with 1½-inch National Standard Thread couplings. Each pre-connected bed of hose is color coded for ease of identification on the fire ground

#### E226 Supply Hose Bed

- Single bed, 1000-feet flat loaded with five-inch large diameter, rubber covered supply hose in 100-foot lengths with five-inch storz couplings. A storz coupling is

## FIREFIGHTING APPARATUS AND EQUIPMENT

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sometimes referred to as a *sexless* coupling, because rather than having a male and female end connected by screw threads, either identical end can be joined to any other end of the same size. The supply line is terminated with a five-inch storz to 4½-inch hydrant adapter.

- Single bed, 800-feet minimum flat loaded with 2½-inch, rubber covered attack hose in 50-foot lengths with 2½-inch threaded couplings. The hose line is terminated with a 2½-inch to (2) 1½-inch wye ball-valve appliance (a hose appliance for splitting one hose line into two or more hose lines).
- One dry load, 2½-inch, synthetic rubber covered attack hose line, 200-foot in length with 50 to 350 gpm automatic fog nozzle with 2½-inch New Cincinnati Thread couplings.
- One dry rear loaded, 1¾-inch, synthetic rubber covered, double jacket, 200-foot in length 50 to 350 gpm automatic fog nozzles with 1½-inch National Standard Thread couplings.

During this incident the following equipment was utilized by E102:

- Five-hundred-feet of large diameter supply hose was deployed at the driveway entrance to the front of the building.
- The front 1¾-inch pre-connected cross-lay (red line) was deployed by Ffr. Schira to the front-entrance door for interior fire control.
- The rear 1¾-inch pre-connected cross-lay (orange) was deployed by E109's company to the rear of the building for interior fire control.
- The rear dry 2½-inch attack line was deployed to the rear of the building and connected to the operator's side pump discharge.
- Fifty-feet of 2½-inch supply line with the gated wye appliance was deployed in the front yard and connected to the officer's side discharge. A 1¾-inch by 200-foot attack line was attached to one side of the gated wye, and deployed to the rear of the building. A 1¾-inch by 100-foot attack line was attached to the other side of the gated wye, and also deployed through the front door for fire control.
- A 14-foot roof ladder was deployed and placed at the front of the building for access to and egress from the second floor.
- A variety of hand tools (e.g., axes, ceiling hooks, etc.) were utilized for fire control.

# FIREFIGHTING APPARATUS AND EQUIPMENT

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## Findings, Discussions and Recommendations

**FINDING #12.1:** The apparatus pump was engaged according to manufacturers instructions, and the apparatus was prepared and operated according to department procedures.

The apparatus was parked forward facing into the driveway towards the fire building (Figure 74). At the time in which fire suppression efforts commenced, E102's personnel deployed 500-feet of large diameter supply hose and one 1¾-inch attack hose line. These are standard Colerain Fire & EMS company evolutions for interior building fire operations.

*Figure 74: Apparatus positioning by E102 at the front of the building.*



**FINDING #12.2:** Apparatus pump test, vehicle deficiency and repair records were reviewed. The pump was service tested, and performed in accordance with NFPA 1911, Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus. Pump and associated accessories functioned without incident and no deficiencies reported.

NFPA 1911 recommends annual testing of apparatus pumps. Pump test documents read that Engine 226's pump was tested by an outside contractor on November 15, 2007 with no deficiencies recorded. Once the incident scene was stabilized, the apparatus was held as evidence at the incident scene by fire and law enforcement investigators during the initial investigative phase. Upon its release from custody on April 5<sup>th</sup>, the vehicle was driven directly to the department's fleet maintenance facility and secured in a locked area. The pump was tested by an outside contractor on April 6, 2008. The apparatus passed with no deficiencies recorded.

## FIREFIGHTING APPARATUS AND EQUIPMENT

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***FINDING #12.3:*** Hose test records of the hose inventory assigned to Engine 226 were reviewed. The hose service test were performed in accordance with NFPA 1962, *Standard for the Inspection, Care, and Use of Fire Hose, Couplings, and Nozzles and the Service Testing of Fire Hose.*

The 1¾-inch attack hose utilized by Colerain Fire & EMS for interior firefighting is *Combat Ready* hose manufactured by Key Fire Hose Corporation. The hose is constructed of an outer jacket woven from staple polyester yarns over an inner liner consisting of a one-piece extruded through-the-weave tube. During this incident, the first 50-foot section of the 1¾-inch attack hose line deployed by E102 sustained damage in the following areas: a) a four-foot section of the outer jacket was burned away starting three-feet from the male coupling (nozzle end) with a six-inch longitudinal separation or rupture of the inner lining in this area (Figure 75), b) a 12 to 18-inch section of the outer jacket was burned away starting 16-feet from the male coupling, and c) a 12 to 18-inch section of the outer jacket was burned away starting 20-feet from the male coupling. It is likely that outer jacket damage and separation occurred as a result of thermal exposure. This was the only section of hose that sustained such damage during the incident. The Task Force Tips, Model: H-VPGI automatic nozzle remained structurally intact with minimal damage. (Figure 76)

*Figure 75: Burned away outer jacket of the attack hose line in the basement*



NFPA 1962 recommends annual testing of fire hose. The 1¾-inch hose line assigned hose inventory number 377 was tested on May 5, 2007 at a pressure of 250 psi for five-minutes in accordance with NFPA 1962 and passed without incident or any deficiencies reported.

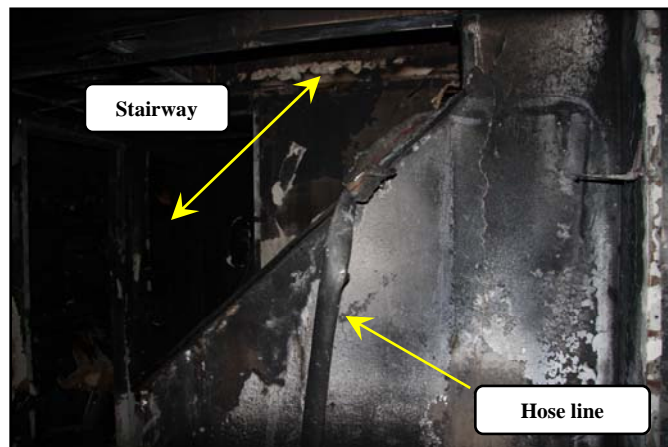
## FIREFIGHTING APPARATUS AND EQUIPMENT

*Figure 76: Approximate location of the attack line nozzle found at the bottom of the basement stairway.*



As RAT25 and R26 personnel searched the basement area for the missing firefighters, they located E102's initial interior attack hose line in the basement stairway. The search teams observed *heavy* water flow in the stairway. The flow was described as coming from the nozzle as well as the separation site. It is theorized that E102's team advanced their hose line down the basement stairway, over the half-wall near the bottom of the stairway and into the recreation room area (based on burn pattern indicators during scene reconstruction as shown in Figure 77). While waiting for the hose line to be charged (filled with water and pressurized from the pumping apparatus), the nozzle operator (Ffr. Schira) opened the nozzle bale (the top handle for opening and closing the nozzle) to expel air in the line and possibly adjust the spray pattern. When the team determined they could no longer advance any further towards the seat of the fire due to insufficient hose length and deteriorating conditions in the basement they evacuated the area. In doing so, the team abandoned the hose line and left the nozzle in the open position in close proximity to the base of the stairway. When the hose line was eventually charged and pressurized, the unattended open nozzle likely reacted

*Figure 77: Stairway wall and hose line burn patterns.*



## FIREFIGHTING APPARATUS AND EQUIPMENT

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uncontrollably in the basement and between the two walls that partially enclosed the basement stairway, and finally coming to rest in the area at the bottom of the stairway.

For interior building firefighting, Colerain Fire & EMS's minimum operating flow and pressure for a 150-foot, 1¾-inch attack hose line is 150 gpm, which requires approximately 150 psi pump discharge pressure (the pressure at the apparatus pump panel for a specific hose configuration). The photographed location in which the nozzle was found may not have been exact due to movement in the immediate area by operating teams during the search, fire extinguishment, checking for fire extension and overhaul phases of the incident.

**FINDING #12.4:** A thermal imaging camera was not assigned to the reserve apparatus, which did not allow an opportunity for use during the initial size-up and fire suppression operations.

A thermal imaging camera (TIC) is a type of thermographic camera used in firefighting. By rendering infrared radiation as visible light, such cameras allow firefighters to see areas of heat through smoke, darkness, or heat-permeable barriers. Thermal imaging cameras are typically handheld, but may be helmet-mounted. They are constructed using heat and water-resistant housings, and ruggedized to withstand the hazards of fire ground operations.

Since thermal imaging cameras can *see* through darkness or smoke, it allows firefighters to quickly find the seat of a building fire or see the heat signature of visually obscured victims. The camera can be used to search for victims outdoors on a cool night, spot smoldering fires inside a wall, or detect overheating electrical wiring.

Although E102's front-line apparatus was assigned a TIC and battery charging base mounted to the apparatus, the TIC was not transferred to the reserve apparatus during the change over of equipment not required by NFPA and ISO. It is likely that the transfer of this particular item did not take place because of no means to charge the battery on the reserve apparatus. During this incident, subsequent arriving fire companies were assigned TIC's (e.g., E25, 26, 109 and L25) that were utilized during firefighting and search and rescue efforts.

**RECOMMENDATION #12.4:** At minimum, fire departments should provide a thermal imaging camera for all front-line and reserve engine and ladder companies.

There is always a potential for reserve apparatus to be placed into front-line service. Whether it be for training scenarios or during the recall of off-duty personnel to staff vacant stations during large scale incidents. For standardization in training, utilize the same make and model TIC for all apparatus is recommended.

## FIREFIGHTING APPARATUS AND EQUIPMENT

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TIC's are a valuable tool during initial and on-going incident size-up, especially when addressing fire situations in wood-frame buildings. In these instances, the company officers or IC can gain valuable insight from the exterior as to a fire's location, extent, and progression through a building. In addition, fire departments must realize that the TIC is a versatile tool, and continually train utilizing the TIC in various situations and operations. This serves to enhance the firefighters' proficiency in its use, allowing them to interpret the images it displays, and to understand its uses and limitations.

**FINDING #12.5:** Inadequate scene lighting possibility was one aspect that contributed to a deficient initial size-up of the involved building.

During this incident as E102 approached the building, it is believed that the ambient light and the minimal lighting provided by the apparatus headlights and cab spotlights on the first-due company possibly did not afford the Capt. Broxterman the adequate means to accurately evaluate the fire and smoke conditions presented as the apparatus approached the building.

**RECOMMENDATION #12.5:** Fire departments should consider providing for current and include on all future apparatus specifications 12-volt cab-mounted forward-facing scene lighting that provides immediate illumination of an incident scene using high-out technology lighting systems (e.g., *Light Emitting Diode*).

At an emergency incident scene, operating in the dark is unsafe and ineffective, while *immediate* scene lighting can enhance firefighter scene size-up upon approach to an incident, avoid downed power lines, find secure footing to quickly move around an incident scene to pull a hose line, or can help rescuers speed extrication efforts, communicate visually in a high-noise environment, and locate victims that may have wandered off or have been ejected from a vehicle.

Recently introduced to the fire service Light Emitting Diode (LED) scene lighting systems provide instant illumination when activated, which eliminates the high current warm-up time associated with other types of light sources (e.g., quartz lighting). Reviewed literature indicated that the impact of 12-volt LED lighting technology on fire apparatus electric systems is minimal. In addition, LED lighting provides long life operation with low current consumption and low operating temperatures.



## Chapter 13

# THE AFTERMATH



## THE AFTERMATH

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### Overview

The fire department's most important asset remains its staff and personnel that perform the job day in and day out. It is imperative to create an environment in which its personnel have the tools and training to conduct the daily business safely and effectively. Continuing to provide for its personnel in the aftermath of a tragedy such as the Squirrelsnest Incident creates monumental challenges for departmental administration. Not only may the department's personnel require special considerations and interventions, but so may the organization itself.

### Personnel

Literature reviews demonstrate the wide and diverse opinions of various experts on the subject of providing emergency psychological first-aid and mental health interventions to firefighters involved in critical incidents. The purpose of this section of the document is not to fully discuss the pros and cons of each intervention, rather to discuss what process Colerain Fire & EMS utilized in the immediate aftermath and the follow-up care provided to department personnel, family and friends.

The Mitchell model of Critical Incident Stress Management has been the prevalent mental health intervention practice in Hamilton County for approximately 20-years. The Southwest Ohio Critical Incident Stress Management Team (SWOCISM), following the Mitchell Model, was the first organized attempt in the region to address and intervene during times of increased stress related to critical incidents for first responders.

A number of alternative strategies intended to provide care for emergency responders have developed over the past decade. These alternative methods, which range in scope from professional psychological care, to providing limited supportive care, all have the same goal in mind: To assist the emergency responder in dealing with the emotional aftermath of a critical incident and to help them to return to work (Conn, 2009, p.11)

### Findings, Discussions and Recommendations

**FINDING #13.1:** Early recognition and action on the part of the Incident Commander to offer mental health services to emergency personnel provided a necessary entry point for those individuals at risk for experiencing critical incident stress reactions.

Realizing the immediate strain placed on those personnel involved in the operations and the need for some type of mental health intervention, Command requested the SWOCISM Team at approximately 07:24. Members of the SWOCISM Team began arriving on scene shortly thereafter and began their assessment of the situation.

## THE AFTERMATH

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Meanwhile, other team members responded to an off-site location to prepare for a group debriefing of the events that had just occurred.

An attempt was made to ensure that all personnel on the scene that morning were offered the opportunity to participate in debriefings and interventions as a group. While most of those involved did participate, a limited number of individuals chose not to participate in the group activity. It should be noted that participation in Critical Incident Stress Management (CISM) activities is not mandatory for Colerain Fire & EMS personnel. However, while not mandatory, services such as the SWOCISM Team and the Employee Assistance Program (EAP) were at least offered to all personnel and their families.

Individual and group debriefings took place in the first few hours after the incident at the remote location. It was important to keep the location of the activity confidential so that media outlets and reporters could not gain entry to interview or distract the personnel. SWOCISM administrators maintained open communications with Colerain Fire & EMS administration and were encouraged to provide continued follow-up and care to those who requested it.

Also realizing that those key individuals who would be involved with the NIOSH interviews may face undue stress before, during or after their interviews, SWOCISM members were on site and interviewed all personnel immediately after their NIOSH interviews.

**FINDING #13.2: Critical incident stress management solutions should be multi-faceted and intended to identify at-risk populations including family members.**

Colerain Fire & EMS administration maintained open communications throughout the immediate post-incident phase with all personnel. One component was realized early: post incident stress issues were not confined to only those individuals involved in operations on the Squirrelsnest scene. As recovery continued and time passed, other populations were identified that would also likely benefit from a CISM consultation by the SWOCISM team.

CISM was offered to all personnel of Colerain Fire & EMS regardless if they were involved in operations on April 4<sup>th</sup> or not. However, it was soon realized that family members (namely spouses and children) of Colerain Fire & EMS members also suffered a huge loss and may experience heightened anxiety about their loved-ones continuing to be involved in this line of work. (Conn, 2009, p.22)

The SWOCISM team offered a group debriefing for family members on a week night soon after the funeral. In addition to the routine mental health providers, other specialists were on hand to provide special-interest therapies and interventions based on

## THE AFTERMATH

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population age and gender. Massage therapists, child-life specialists and pet therapy specialists were readily available. Many wives and children attended the session and the whole experience was perceived to be a positive experience by those involved.

**FINDING #13.3:** As with the implementation of any new organizational program, the efficacy and utilization of CISM and other mental health solutions offered to Colerain Fire & EMS personnel must be examined and measured to ensure it met expectations.

In the immediate aftermath following the incident and the funeral, several attempts were made to provide effective follow-up measures to personnel and family. As time continued, however, and things began settling back to “normal”, the perceived importance of continued follow-up seemed to decline. At the seven-month anniversary, a Colerain Fire & EMS employee conducted a survey and analysis of the CISM response to the Squirrelsnest Incident as part of a post-graduate research project. The results of the survey revealed that while most of the Department members felt that the CISM response to their needs was acceptable and appropriate, there remained some personnel of the department that continued to experience some types of stress issues including depression, relationship issues and chemical dependency (namely off-duty alcohol use). (Conn 2009, p.18)

A key finding in the abovementioned research project is that many individuals chose not to participate in any CISM, either formal or informal. The reasons cited for their non participation were as wide and varied as individuals themselves. However, further perpetuating the macho image of the firefighter were claims that they simply didn’t need anyone to talk.

**RECOMMENDATION #13.3:** Fire departments must make a commitment to providing regular and routine follow up to CISM responses, especially in cases of LODD.

Fire department administrations must inform any CISM provider or group of the need for personalized and regular follow-up. This should be done as a part of the original agreement to have CISM services provided. The responsibility of ensuring follow-up lies on all individuals, but ultimately with the officers and administration. It is imperative for company officers to have a good handle on the mental stability and health of those assigned to them and offer the appropriate resources when deemed necessary. The Colerain Fire & EMS prides itself on having officers and supervisors who take an active part in the daily operations with their employees. This daily interaction provides the officers with an opportunity to assess and monitor the mental health of his or her employees.

**FINDING #13.4:** The site walk-through tours provided those not on the scene on April 4<sup>th</sup> with much needed information concerning the scene and conditions inside the building.

## THE AFTERMATH

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Following lessons learned from their own LODD investigation five-years earlier, representatives from the Cincinnati Fire Department encouraged Colerain Fire & EMS administration to provide a scene tour for all personnel of the Colerain Fire & EMS in the initial weeks following the fatal fire. It was their experience from conducting similar walk-through's to their own personnel that Cincinnati Fire Department personnel gained a better understanding of the incident and helped them to answer some of their own internal questions about the scene.

As soon as all fire origin and cause investigations had been completed, times were set aside for on-duty and off-duty personnel to tour the grounds and the building. Personnel from Cincinnati Fire Department's Training Division were on hand to assist with the walk-through tours. Utilizing outside training personnel provided a measure of distance to our own personnel. It was the overwhelming opinion (Colerain Fire & EMS research paper) that if Colerain Fire & EMS personnel (officers) had conducted the tours, they may have been subjected to questions regarding tactics, operations, etc. Cincinnati Fire Department personnel simply provided a measure of safety during the tours and helped to facilitate the learning process.

The Colerain Fire & EMS maintained authority over the scene and posted a uniformed police officer to document visitors and personnel that attended the walk-through tours. It was the intentions of the Colerain Fire & EMS administration to ensure that all Colerain Fire & EMS personnel and mutual-aid personnel involved in operations were afforded the opportunity to visit the scene.

### Organizational Challenges

Few events possess the ability to change an organization as dramatically and unexpectedly as the tragic loss of co-workers during the *normal* course of conducting business. Needless to say, the Colerain Fire & EMS was presented with monumental challenges after the sudden loss of Capt. Broxterman and Ffr. Schira. However the Colerain Fire & EMS benefited from an extensive network of professionals and other emergency organizations that assisted us in most every aspect from funeral planning to death benefits. For this assistance, the Colerain Fire & EMS offers its gratitude and appreciation.

During the 24-plus months since the incident, the Colerain Fire & EMS has faced many challenges from an administrative and organizational standpoint. These challenges have been difficult to assess and quantify because many of them were subtle and evolved slowly over a long period of time. While considering some of these challenges individually, they may seem insignificant, but when considered in the context of recovery from a tragedy, they could indicate pressing organizational issues, such as morale problems, decreased job satisfaction and poor performance.

## THE AFTERMATH

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This section should provide the reader with some information to consider when dealing with any organizational challenge or traumatic event. Not all effects of a disaster can be seen in the immediate aftermath. Organizational issues such as increased use of sick time, stressed interpersonal relationships, reflexive policy-making and ineffective communications can have costly implications for the organization not only in terms of budgetary concerns, but in terms of workplace satisfaction and productivity.

Organizational recovery is a dynamic and flexible process that actually begins prior to the traumatic event. Planning ahead for organizational challenges as part of everyday practices can help an organization through these times. The general state of the organization prior to a traumatic event may just be the best predictor of an organization's ability to recover. (Allen and Toder, 2004, p.41)

Administrations must strive for increased efficiency, better communications and problem solving as part of the "normal" daily operation. Proper delegation and solid leadership are paramount to providing an environment in which problems solve themselves and employees are empowered to act, (within their chain of command). Micro-management and poor focus on the organization's major goals have the power to destroy an organization from the inside. (Albrecht, 2003, p 151)

Disaster planning is essential. (Allen & Toder, 2004, p.44) As emergency response entities, fire departments have contingency plans to accommodate practically any type of disaster that could befall their community. Natural disasters, terrorist attacks and other disasters are meticulously planned for and accommodations made to mitigate any emergency. However, few fire departments have internal disaster plans intended to deal with issues that would disrupt their normal operations.

Issues such as early retirement of an administrative or chief officer, sudden budgetary constraints, building maintenance issues, death of a co-worker and sudden information technology crashes can send an organization scrambling. Internal disaster planning has been a mainstay in the private and public business world for years. It may be time for fire departments to adopt this normal business practice.

**FINDING #13.5: Progress on the LODD Final Report slowed after the release of the initial Preliminary Report in July of 2008.**

Work on the Preliminary Report was deliberate and purposeful. Those individuals working on the report had a clear vision and focus on the need for a timely and concise initial report. However, once that objective was achieved in July of 2008, work gradually tapered off as the enormity of the task ahead was slowly revealed.

Weekly meetings became monthly meetings during vacation season and gradually other pressing issues and programs began superseding the work on the final report.

## THE AFTERMATH

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In response to the additional work mentioned above, progress on the Final Report became painstakingly slow. In August of 2009, weekly meetings once again re-convened and steady, albeit slow, progress has been made towards the completion of this document.

**RECOMMENDATION #13.5a:** Allocation of appropriate resources to complete an investigation and report is a must. Fire departments should weigh the benefit of placing shift-personnel on administrative *daytime* hours to provide consistency in work and progress.

The resources available to a department must be taken into account when considering appointing a dedicated Investigation Team. Smaller departments may find it impossible to allocate the monies and resources to such an endeavor, when large municipal departments can have seemingly unending resources.

**RECOMMENDATION #13.5b:** Fire departments should consider appointing a Project Manager (PM) to oversee completion of the report. This PM should have limited responsibilities in other areas until the report is completed.

**RECOMMENDATION #13.5c:** Fire departments must not rush the process of investigation and report. This should be considered a marathon rather than a sprint.

**FINDING #13.6:** The Colerain Fire & EMS resisted the urge to make sweeping changes and *reflexive policy-making*.

Immediately following a tragedy like Squirrelsnest, calls will be made for administrations to make sweeping changes to operations and to adopt policies and procedures that address apparent mistakes or shortcomings encountered at the scene of the incident. Our experience was no different.

Simply based on the fact that our two firefighters died while making an interior attack on a confirmed basement fire it would have been easy for the Colerain Fire & EMS Administration to make a blanket policy of restricting interior operations on basement fires. However, based on interviews and Investigation Committee recommendations, best-practices from other departments were researched and a comprehensive basement fire policy was developed and implemented after department-wide training on the policy.

**FINDING #13.7:** The decision to publish the Preliminary Report in July of 2008 provided fire departments around the country with potential learning opportunities and the chance to train based on findings presented in the report.

On February 9<sup>th</sup>, 2009, Colerain Fire & EMS Chief Smith received an e-mail correspondence from a Northern Ohio Fire Chief expressing his appreciation for the Colerain Fire & EMS releasing the preliminary report to the fire department community.

## THE AFTERMATH

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Apparently his department had utilized the Preliminary Report as a basis for conducting “Close-Call” trainings and used the information contained in it to perform scenario-based below grade level fire training.

The value of the training paid huge dividends when, shortly after conducting the training, their department was dispatched to a working fire in a basement. The residential building was very similar in design and layout as the Squirrelsnest residence with a fire in much the same location. Prior to initiating an interior attack through the front door, their company officers performed a comprehensive 360-degree assessment of the building and discovered a walk-out basement. After re-deploying fire attack teams to the rear, the first-floor collapsed into the basement.

The Fire Chief had determined that his department’s success in completing the comprehensive size-up was a direct result of the training they had conducted utilizing the Preliminary Report.

**RECOMMENDATION #13.7a:** The Colerain Fire & EMS Final Report should be made conveniently available to all fire departments and persons interested in reviewing the findings and discussions contained herein.

In addition to printed full-color copies, the Final Report must be made available as an internet downloadable link from the Department’s website. Due to the sheer length of the document and all its associated appendices and supporting documents, the report should be made available as a PDF document in several different sections. It can then be printed at the convenience and expense of the individual.

**FINDING #13.8:** Organizationally speaking, Colerain Fire & EMS allocated resources to prepare for some of the challenges it would face during the months and years following the tragedy.

As mentioned above, organizations will undoubtedly experience challenges and disruption when dealing with sudden internal crises. Proper research and planning for these unexpected situations is paramount in order to get through these rough periods.

**RECOMMENDATION #13.8a:** Further research into preparedness for organizational recovery should be conducted to identify vulnerabilities and potential breakdowns within an organization during times of crisis.

This final section of the LODD report should offer a call to fire departments around the globe to consider the enormous organizational challenges that may present themselves in the wake of a tragedy such as Squirrelsnest Incident. Unfortunately for fire service organizations, there seems to be relatively few resources and only a small body of research dedicated to organizational recovery.

## THE AFTERMATH

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Following the September 11<sup>th</sup> 2001 attacks, several news stories and articles were dedicated to organizational recovery and grief in terms of businesses “getting back on their feet.” However, most fire departments do not fit into the mold of a “typical” business model. Therefore, research into specific fire department related issues must be conducted. Fire Departments should research organizational recovery issues and determine how their organization could benefit from strategic planning for an internal disaster such as an LODD. Reacting after an incident is too late to begin applying patches to issues that need whole solutions. Without proper planning and anticipation of issues, any resulting organizational confusion may develop into the new organizational norm.

Furthermore, in terms of grief as it relates to organizational recovery from a tragedy, an Organizational Grief Theory should be researched and developed. There are numerous models of organizational change of which grief is definitely a consideration in change. However, it is the author's opinion that organizations may also progress through stages of grief, much like an individual progressing through the Kubler-Ross Grief Cycle. Organizations may deal with Denial, Anger, Bargaining, Depression and Acceptance through policy-making and personnel decisions.

The goal of understanding organizational change and grief in the fire service is to ultimately provide fire service organizations with a safer workplace, safer firefighting practices, better operations and increased job satisfaction.

## THE AFTERMATH

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- Albrecht, K. (2003). *The Power of minds at work: organizational intelligence in action*. New York: AMACOM.
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## THE AFTERMATH

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IN MEMORY  
FALLEN BUT NEVER FORGOTTEN

## Chapter 14

# CONCLUSION

CAPTAIN  
LEROY J.  
HAMMITT  
OCTOBER 19, 1964

LIEUTENANT  
CHARLES  
PALM  
NOVEMBER 29, 1977

CAPTAIN  
ROBIN "ZANG"  
OXTERMAN  
APRIL 4, 2008

FIREFIGHTER  
ALLEN BRUCE  
PRICE  
OCTOBER 19, 1964

FIREFIGHTER  
BRIAN "CHICO"  
SCHIRA  
APRIL 4, 2008

FOUNDED 1934  
BY  
GROESBECK PASSN



## CONCLUSION

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This section summarizes the major conclusions of the Department's internal investigation. It should be noted that the conclusions represent a total consensus of the investigation committee's efforts. In addition, it should be emphasized that although the facts linked to this incident were at times challenging. These challenges provided committee members periods of concentrated and sometimes passionate dialog.

It cannot be conclusively known as to why Capt. Broxterman and Ffr. Schira proceeded into the area of the building that eventually collapsed resulting in their deaths. The investigation committee has concluded that the most probable explanation is that E102's three-person interior team was successful in advancing their uncharged attack hose line into the basement recreation room area; reaching a point approximately 10 to 15-feet from the bottom of the basement stairway as shown in the *Incident Overview* chapter, page 34, figures 18 and 19. Once the team reached this area, it was realized they did not have sufficient hose line to continue advancing towards the seat of the fire. The team's third member (Ffr. #2) reversed his travel and made his way back to the exterior of the building to advance additional hose line. As the team of two waited for additional hose line to be stretched and the hose line to be charged by the pump operator, the interior conditions rapidly deteriorated to a stage that it became untenable for them to hold their position. The team evacuated back-up the stairway without following the hose line, which by all indications was tight up against the stairway wall and tightly wrapped around the stairway door entry. Once at the top of the stairway, one of the two deceased, if not both were likely in some form of distress; became disoriented and proceeded into the family room in a direction opposite the route of travel from which they entered the building. As the two moved across the family room floor, the flooring system collapsed into the utility room area of the basement. When the third team member re-entered the building, he was unable to locate the other two members. The inability of Ffr. #2 to locate his team and the loss of radio communications contact with the interior team prompted the IC to declare a Mayday and activation of the RATs. This incident resulted in tragedy primarily due to the concealment of several burned-through floor joists under the carpet covered flooring system, which was nearly impossible to recognize due to heavy smoke conditions inside the burning building.

The following factors are believed to have directly contributed to the deaths that occurred in this incident:

- The delayed arrival at the incident scene allowed the fire to progress significantly and the hazardous conditions to exponentially increase;
- The failure to adhere to fundamental firefighting practices (e.g., entry into an enclosed building with obvious working fire conditions *without* a charged attack hose line);

## CONCLUSION

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- The failure to abide by the fundamental concepts of fire fighter self-rescue and survival (e.g., following of the hose line in the direction of travel back to the building's entrance or exit).

Although the aforementioned factors are believed to have directly contributed to the deaths reported here, they might have been prevented if:

- Some personnel had not been complacent or apathetic in their initial approach to this incident which eventually led to being overwhelmed in their response to their initial findings;
- Some personnel were in a *proper state of mind* that made them more observant of their surroundings and indicators, and the *potential* threats and risks that presented themselves;
- The initial responding units were provided with all pertinent information in a timely manner relative to the incident, especially critical was the information given to the emergency communications center from the homeowners reporting an actual fire.
- Personnel assigned to E102 possessed a comprehensive knowledge of their *first-due* response area specifically related to road and street locations, and any particular characteristics related to those areas.
- A 360-degree size-up of the building accompanied by a risk - benefit analysis was conducted by the company officer prior to initiating interior fire suppression operations; the risk of an action must be weighed against the probable benefit that may be reasonably and realistically expected.
- Comprehensive standard operating guidelines specifically related to structural firefighting existed within the department;
- The communications system users (on-scene firefighters and those monitoring the incident) weren't all vying for limited radio *air time*. This competition led to missed and distorted messages and less than efficient use of resources, which exacerbated the problems of already taxed communications.
- The communications equipment and accessories utilized were more appropriate for the firefighting environment;
- Certain tactical-level decisions and actions were based on the specific conditions as encountered with an emphasis placed on fire ground tactical priorities (i.e., life safety, incident stabilization and property conservation);
- Personnel had initiated fundamental measures to engage in if they were to become disoriented or trapped inside a burning building; and
- Issued personal protective equipment was utilized in the correct manner.

## CONCLUSION

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Our analysis emphasizes substantial recommendations derived from this investigation, and point towards areas of improvement not only for Colerain Fire & EMS, but the fire service profession. The majority of the findings and observations discussed in this analysis for the most part do not represent new breakthroughs in structural firefighting concepts. Rather the findings support the need for:

- Strengthen advocacy for the installation of automatic residential fire sprinklers;
- An improved interest in safety among fire department personnel at every level of the organization hierarchy;
- Emphasizing the significance of conducting an emergency incident scene risk-benefit analysis based on the following:

We will risk nothing to save what is already lost (lives and property).

We will risk little to save a little (salvable property).

We will risk a lot to save a lot (savable lives).

- An increased focus on education and training with an emphasis on fundamental firefighting skills and practices, building construction principles, situational awareness, and improved fire ground communications;
- The development and adherence to organization standard operating guidelines that help ensure a safe operation and the successful completion of an incidents' mission; and
- Improved reliability and durability of radio communications and personal protective equipment for use in a firefighting environment.

As one contemplates the information contained in this report, there is a listing of excerpts from a web log (blog) by Ray McCormack titled, *Tactical Safety: Why the Engine Needs to be Perfect*, which symbolically represents many aspects related to this incident.

"As we know, no company operation is always perfect...."

"Get out your calculator and determine the risk to savable and responder life when no water is made available to your compartment battle ground."

"Some fights we can complete without ever changing our attack style, while other battles will require a combination of approaches for containment."

"We must come to the battle properly dressed and equipped with a full team and dynamic leadership."

"The best firefighter survival tool we have is a charged hose line."

## CONCLUSION

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"Enter the fire area with a charged hose line and you will be on your way to becoming a perfect engine because you understand the need for our greatest life saving tool." (2010)

As a last note to the readers of this report, we want to say that the most arduous undertaking in this whole process has been achieving equilibrium between analysis and despondency. The efforts of the committee were aimed at achieving peace of mind for all and an increased understanding with the expectation that the knowledge acquired will help advert similar future tragic incidents. We've suffered a great loss, and because of that loss, Colerain Fire & EMS has a renewed commitment to providing emergency services at the highest level possible, while conducting business in a more effective, efficient and safer manner. As we move forward, the department will continue to work diligently to be a leader in the preparation and performance of providing emergency services and keeping the department on the *cutting-edge of all the services we provide*.

## CONCLUSION

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## REFERENCES

McCormack, R. (2010, February 19). Tactical safety: Why the engine needs to be perfect". Message posted to <http://thehousewatch.netfirms.com/wordpress/?=578>

## CONCLUSION

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# **APPENDIX A**

## **LODD Fact Finding Committee Preliminary Report**

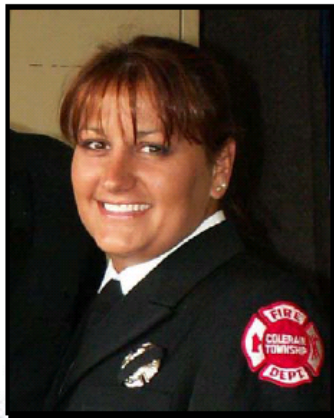


LODD Fact Finding Committee Preliminary Report

Colerain Township Department of  
Fire and Emergency Medical Services

Line of Duty Death  
Fact Finding Committee  
*Preliminary Report*

July 11, 2008



*Captain Robin M. Broxterman*  
*April 16, 1970 – April 4, 2008*



*Firefighter Brian W. Schira*  
*October 15, 1978 – April 4, 2008*



## APPENDIX A continued

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### SQUIRRELSNEST LANE LINE OF DUTY DEATH FACT FINDING COMMITTEE PRELIMINARY REPORT

July 11, 2008

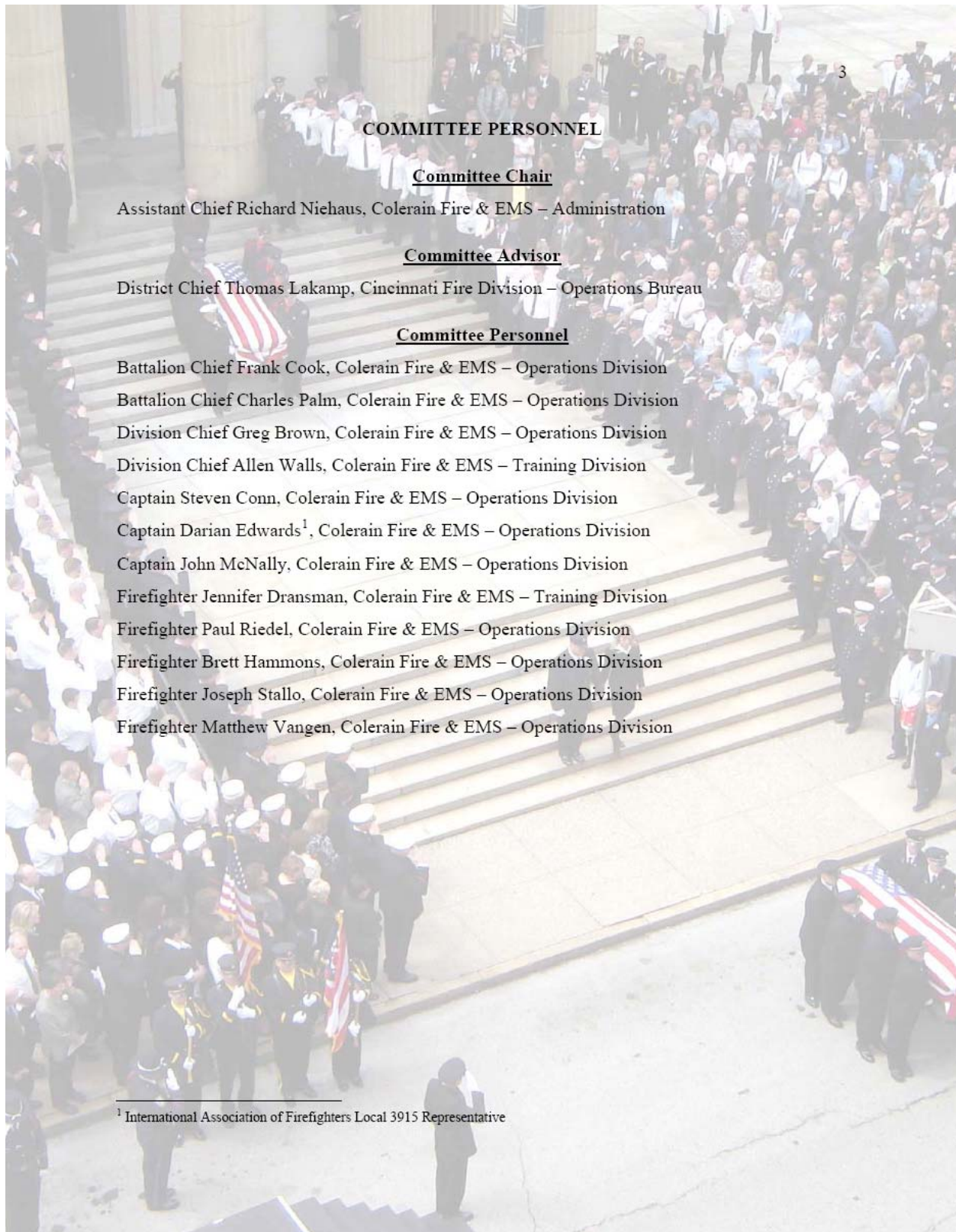
The information contained within this document is a product of the Squirrelsneast Lane Line of Duty Death (LODD) Fact Finding Committee. It should be emphasized that this document is, as indicated in the title, a *Preliminary Report*. The focus of this committee is to identify the facts pertaining to the line of duty deaths of Captain Robin M. Broxterman and Firefighter Brian W. Schira, and to recommend measures that could prevent the risks of similar events within the Colerain Township Department of Fire & Emergency Medical Services (Colerain Twp. Fire & EMS) and the fire service profession. The information contained in this document is the compilation of interviews conducted in conjunction with the National Institute of Occupational Safety and Health (NIOSH) on Monday, April 21 through Wednesday, April 23, 2008, as well as the investigative efforts of committee personnel. The contents of this document relative to this incident are factual and verifiable as agreed upon by all personnel of the committee. This document is the preliminary findings and is only relative to the time line of events of the structure fire incident at 5708 Squirrelsneast Lane on Friday, April 4, 2008.

A second more comprehensive document will be produced by various sub-committees within the fact finding committee. These sub-committees will solicit and welcome all contributions from all Colerain Fire & EMS personnel. This comprehensive document will examine all general operating guidelines, standard operating procedures, training and experience levels of personnel, equipment and technology and many other factors that may be relevant to the deaths of Captain Robin M. Broxterman and Firefighter Brian W. Schira, and the injuries sustained by the other firefighting personnel. This document will also address the factors to possibly prevent the death or injury to firefighters in the future. It is anticipated that the comprehensive document could take up to 18-months to complete.

Respectfully Submitted,

The Squirrelsneast LODD Fact Finding Committee

## APPENDIX A continued



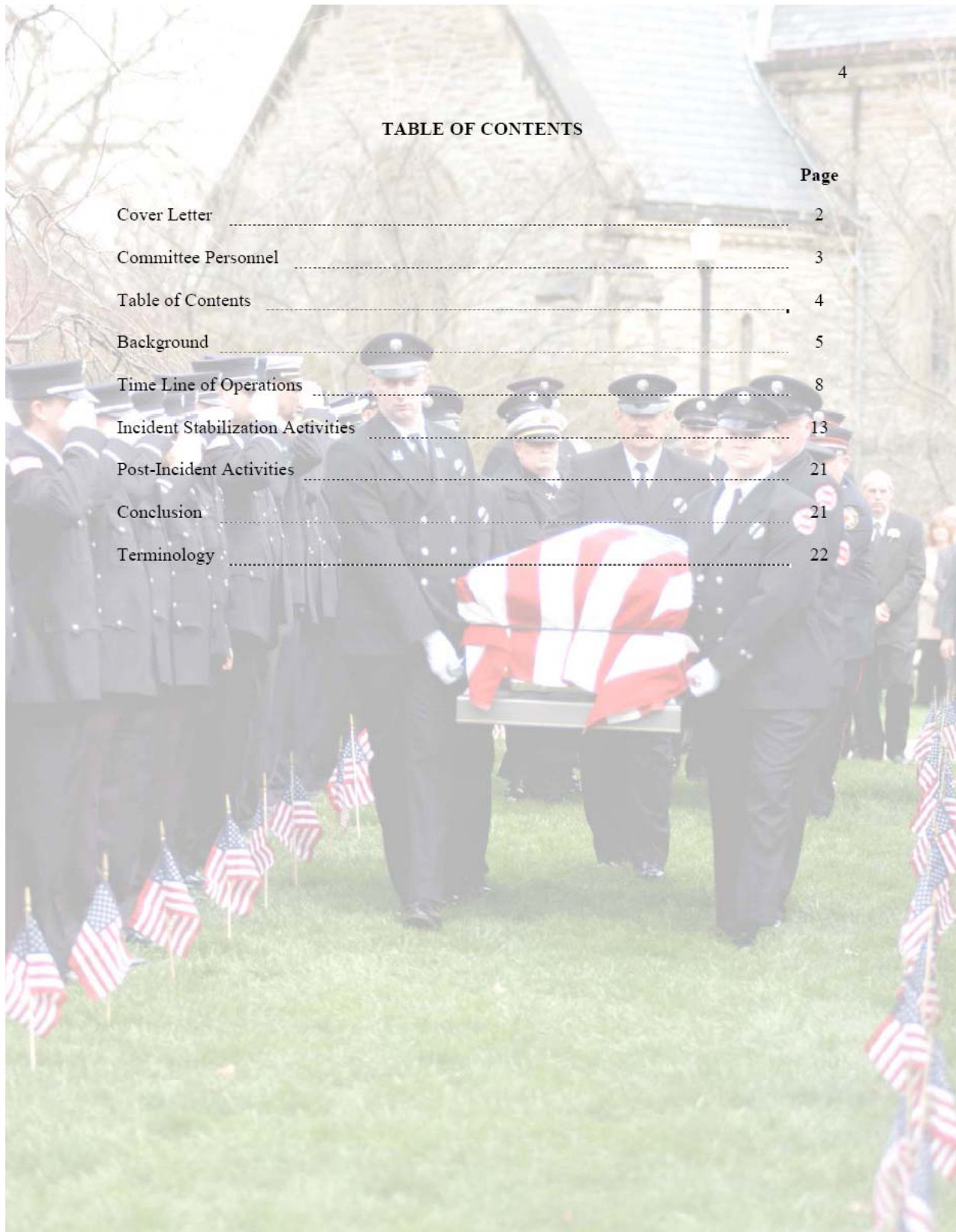


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## BACKGROUND

On Friday, April 4, 2008, Captain Robin Broxterman, 37-years-old, a 17-year veteran career firefighter and paramedic, and Firefighter Brian Schira, 29-years-old, a six-month probationary, part-time firefighter and Emergency Medical Technician with Colerain Fire & EMS died after the floor they were operating on collapsed at a residential structure fire. At approximately 06:11:23, the Hamilton County Communications Center (HCCC) received notification from the American District Telegraph (ADT) Alarm Company reporting an automatic fire alarm activation from the first floor smoke detector and basement carbon monoxide detector at 5708 Squirrelsneest Lane (LN). An automatic fire alarm response complement of two engine companies (Engines 102 & 109), one ladder company (Ladder 25), and the Battalion Chief (District 25) were dispatched to investigate at 06:12:45. At 06:13:43, a second notification was received from the female homeowner reporting a fire in the basement of the structure. At 06:20:43, a third notification by means of a cellular phone from the female homeowner to HCCC routed through the City of Cincinnati dispatch center was received. At 06:22:41, the initial response complement was then upgraded to a structure fire response complement to include one additional engine company (Engine 25), one rescue company (Rescue 26), and one squad unit (Squad 25). Engine 102 (E102), with assigned four personnel (one Captain, one Fire Apparatus Operator [FAO], and two firefighters) arrived on the scene at approximately 06:23:45 reporting moderate smoke showing and established *Squirrelsneest Command*. Verification was made by the E102's FAO through *face-to-face* communication with the male homeowner that all occupants were out of the structure, which was then relayed to Captain (Capt.) Broxterman. District 25 arrived at the scene at 06:26:18, and assumed *Command* from Capt. Broxterman. At 06:26:29, Capt. Broxterman, Firefighter (Ffr.) Schira and E102's Ffr. 2 deployed a 1¾-inch pre-connected hose line through the front main entrance toward the rear of the structure. The fire was determined to be located in the basement of the structure. At 06:27:35, Capt. Broxterman reported, "E102 making entry into the basement, heavy smoke". At 06:34:20, Engine 25 (E25), the designated Rapid Assistance Team (RAT), having just completed their 360-degree size-up around the structure encountered E102's Ffr. 2 in the front yard of the structure, whom reported that he had lost contact with his crew.

At 06:35:10, the Incident Commander identified a potential *Mayday* operation, which indicates a life threatening situation to a firefighter. RAT25 was deployed at 06:36:30. An official *Mayday* operation was declared at 06:37:23, and an immediate request was made at 06:37:30 to the HCCC for a second alarm complement of firefighting resources. At 06:41:43, RAT25 entered the basement from the rear of the structure. At 07:00:12, E26's personnel entered through the front main entrance of the structure and into the basement by means of the interior stairway. It was noted that during the search efforts, no audible signals from either victim's Personal Alert Safety System devices were heard. Both firefighters were located in the basement. Capt. Broxterman was located at 07:08:05, and Ffr. Schira was located at 07:29:28. Both firefighters were buried under collapsed structural components and contents. Capt. Broxterman and Ffr. Schira were declared deceased at the scene as a result of their injuries.

### Building Construction

The structure at 5708 Squirrelsnest LN (Figure 1) was an approximate 2,046-square-foot<sup>2</sup> (main two floors), two-story, single-family home located in the Squirrelsnest Subdivision in the Dunlap area of the township. The structure was constructed in 1991, in a conventional style; it was of traditional wood frame and brick veneer construction, a gable roof with composition shingles, and a poured foundation with a finished walkout basement. The main level (first-floor) flooring system was comprised of 2-inch by 10-inch wood joist constructed 16-inches on center with ¾-inch oriented strand board as the sub-floor. The structure was heated and cooled by means of natural gas and electricity.



*Figure 1: Front (alpha side) photo of 5708 Squirrelsnest LN.*

### Weather Conditions

The weather conditions provided light rain, and an approximate temperature of 58-degrees Fahrenheit, and a measured, sustained wind speed of approximately nine-miles per hour (mph) from the south southwest with wind gusts up to approximately 17-mph<sup>3</sup>.

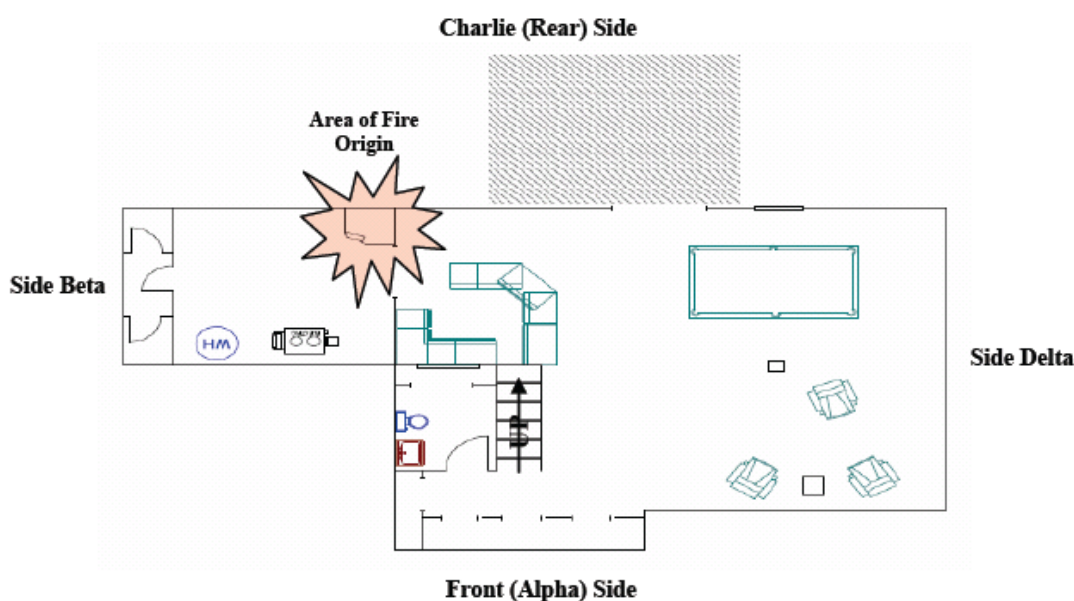
### Fire Origin and Cause

According to the Ohio State Fire Marshal's Office, the origin and cause of the incident was classified as accidental, with the official cause listed as an electrical short in a fan that

<sup>2</sup> Retrieved from the Hamilton County Auditor's Website: <http://www.hamiltoncountyauditor.org/realestate/rover30.asp>

<sup>3</sup> Retrieved on April 16, 2008 from the Weather Underground Website:  
<http://wunderground.com/history/airport/KHAO/2008/4/4/DailyHistory.htm>

originated in the basement near a converted cedar wood lined closet used to cultivate orchids (Figure 2).



*Figure 2: Structure's basement layout indicating fire area of origin. (Ohio State Fire Marshal's Office)*

## Deceased Firefighter's Activities Prior to Incident

### Capt. Robin Broxterman

Capt. Broxterman commanded the personnel assigned to E102 and was the station officer on Unit One at Fire Station #102 located at 11474 Colerain Avenue. As a career firefighter, Capt. Broxterman was assigned an on-duty 24-hour shift and off-duty 48-hour schedule. The following are the on-duty activities of Capt. Broxterman during her last shift, April 3, 2008, prior to her arrival at the fire incident at 5708 Squirrelsnest LN on April 4, 2008.

Capt. Broxterman reported for duty and began her shift at 07:00:00 on Thursday, April 3, 2008. For most of the day, Capt. Broxterman conducted her daily routine (e.g., basic oversight of station, apparatus inspections and inventories, housework, briefings). Capt. Broxterman responded to an emergency medical incident at 14:47:19 that resulted in the engine company personnel assisting personnel assigned to Squad 25 and Advanced Life Support 25 with preparing the patient for transportation to a medical facility. Capt. Broxterman utilized personal time-off from 17:30:00 until 22:30:00 to provide emergency medical technician instruction at another local fire department. There were no incident responses for E102 that interrupted her sleep period during the night of April 3. At the time the alarm was received on the morning of April 4, Capt. Broxterman was conducting her physical conditioning routine.

### Ffr. Brian Schira

Ffr. Schira was assigned to E102 on a rotational basis. As a part-time firefighter, Ffr. Schira was assigned an on-duty 12-hour shift and off-duty 60-hour schedule. The following are the on-duty activities of Ffr. Schira during his last shift, April 4, 2008, prior to his arrival at the fire incident at 5708 Squirrelsnest LN.

Ffr. Schira reported for duty and began his shift at 06:00:00 on Friday, April 4, 2008. The activities of Ffr. Schira prior to receipt of the alarm are unclear at the time of this document. It is assumed that Ffr. Schira was in the process or had conducted his normal preparatory routine of readying his personal protective equipment (PPE) and communications equipment including the placement of his *accountability name tag* on E102's *passport*. Passports are updated at the beginning of each duty shift and placed on the apparatus dashboard until they are used at an emergency incident scene.

### TIME LINE OF OPERATIONS

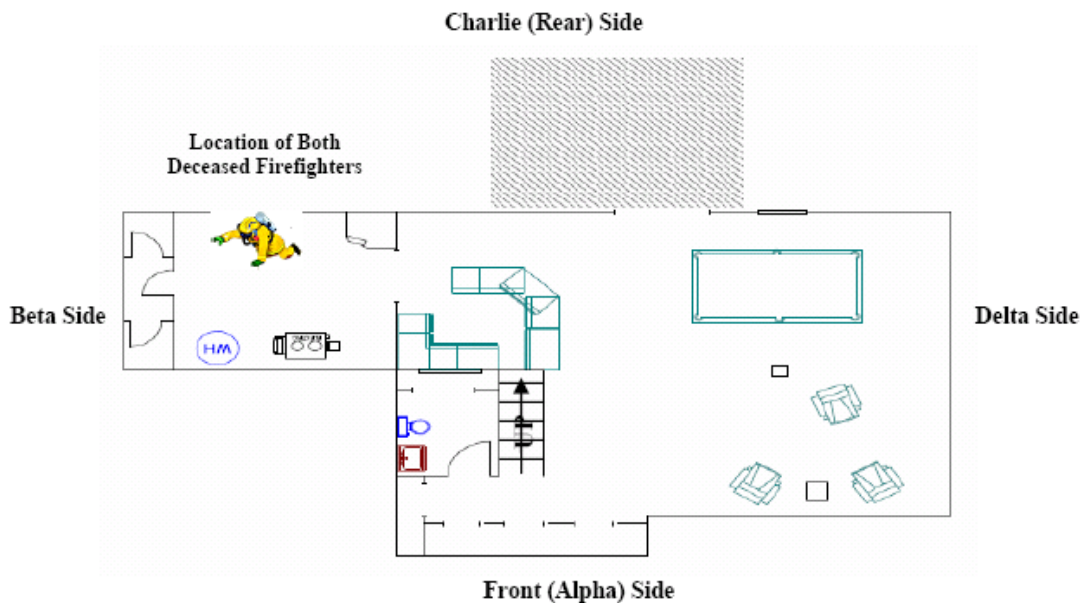
The following time line of operations during the firefighting and rescue effort provides the reader with a brief description of significant occurrences throughout the incident. Following each time stamp, the radio channel that a message was transmitted or received is identified in brackets (e.g., Fire Department West [FD. West], Fire Ground 2 [FG 2], etc.). A more descriptive time line will be included in the forthcoming comprehensive document.

- **06:11:23** – First notification to the HCCC from ADT Alarm Company reporting an automatic alarm activation from the main floor smoke detector and basement carbon monoxide detector for 5708 Squirrelsnest LN.
- **06:12:45 [FD West]** – E102, Engine 109 (E109), Ladder 25 (L25) and District 25 (D25) are dispatched to investigate the automatic fire alarm activation at 5708 Squirrelsnest LN. They are assigned “Fire Ground Channel Two” (FG 2).
- **06:13:43** – HCCC receives a phone call from the female homeowner stating, “We have a fire at our house.” “In the basement.”
- **06:13:49 [FD West]** – E102 advises HCCC they’re enroute to the scene.
- **06:20:43** – HCCC receives a second phone call from the female homeowner by means of cellular phone reporting a structure fire. This call was transferred from the City of Cincinnati Dispatch Center.
- **06:21:44 [FD West]** – HCCC advises all units of, “a working structure fire”.
- **06:22:41 FD West** – Engine 25 (E25), Rescue 26 (R26), Squad 25 (S25), dispatched to 5708 Squirrelsnest LN for a fire alarm that is now, “a working structure fire”. They are assigned “Fire Ground Channel Two”.

- **06:23:45 [FD West]** – E102 on scene. Reports moderate smoke showing, and establishes Squirrelsnest Command.
- **06:25:42 [FD West]** – HCCC advises, “Received an additional call stating that the fire was in the basement of the residence, ... of Squirrelsnest LN”.
- **06:26:18 [FD West]** – D25 on-scene, and assumes Command of the incident.
- **06:26:29 [FG 2]** – E102’s Capt. Broxterman transmits, “E102 is advancing into the structure at this time. Stand by.”
- **06:26:36 [FG 2]** – E102’s Capt. Broxterman transmits, “... , we need water”.
- **06:26:46 [FG 2]** – L25’s Officer in Charge (OIC) transmits, “We do have a working fire”.
- **06:26:51 [FD West]** – Command requests a Colerain staff notification.
- **06:27:21 [FG 2]** – Car 2508 on-scene. Assigned to the rear of the structure as the *rear sector* officer.
- **06:27:35 [FG 2]** – E102’s Capt. Broxterman transmits, “E102 making entry in the basement, heavy smoke”. Last verbal contact with Capt. Broxterman.
- **06:29:03 [FG 2]** – E102’s Ffr. 2 transmits, “we need water”.
- **06:29:09** – E102’s FAO charges 1¾-inch pre-connected hose line deployed by Capt. Broxterman, Ffr. Schira and E102’s Ffr. 2.
- **06:30:20 [FG 2]** – E109’s OIC advises the incident commander, “... contact 102, have them pull out of this first-floor, redeploy to the back. It’s easy access. Conditions are changing at the front door”.
- **06:30:40 [FG 2]** – E25 on-scene as RAT25.
- **06:32:27 [FD West]** – R26 on-scene.
- **06:33:11 [FG 2]** – First of two radio transmissions (open microphone).
- **06:33:19 [FG 2]** – Second radio transmission (indiscernible)
- **06:33:28 [FG 2]** – Command transmits, “Unit calling, repeat”.
- **06:34:20** – E102’s Ffr. 2 exits structure, and reports he’s lost contact with his crew.
- **06:34:26 [FD West]** – S25 on-scene.
- **06:35:10** – Incident Commander considers Mayday operation after several unsuccessful attempts to contact E102.
- **06:35:35 [FD West]** – Engine 26 (E26) notifies HCCC, that their responding to the Squirrelsnest fire incident.
- **06:36:30 [FG 2]** – RAT25 activated by Command.
- **06:37:23 [FG 2]** – Command officially declares a Mayday operation.

- **06:37:30 [FD West]** – Command requests a second alarm complement for firefighting and rescue resources.
- **06:38:30 [FD West]** – Engine 103 (E103), Engine 28 (E28), Fairfield Rescue, Ladder 42 (L42), Ross Engine 11 are dispatched as the second alarm complement.
- **06:40:30 [FG 2]** – Car 2501 on-scene.
- **06:41:27 [FD West]** – “Fire Ground Channel 11” (FG 11) is assigned for firefighting operations. FG 2 is maintained for Mayday operations.
- **06:41:36 [FD West]** – Additional request for Colerain staff notification requested using the words *Mayday Operation*.
- **06:41:43 [FG 2]** – RAT25 transmits, “RAT 25 for Command, be advised we’re making entry into the basement”.
- **06:41:49 [FD West]** – Command requests two additional EMS units.
- **06:43:59 [FG 11]** – Car 2506 on-scene and is assigned accountability.
- **06:44:00 [FG 11]** – It’s estimated that at this time Car 2501 assumes Command of the incident. District 25 assigned oversight of Mayday operations on FG 2.
- **06:44:54 [FD West]** – Squad 225 and Squad 26 are dispatched to Squirrelsnest LN.
- **06:45:35 [FD West]** – E26 on-scene.
- **06:45:51 [FG 2]** – 1¾-inch pre-connected hose line one found in basement unattended.
- **06:49:00 [FD West]** – L42 and E103 on-scene.
- **06:49:59 [FG 11]** – Car 2512 and Car 2514 on-scene. Car 2514 is assigned front sector.
- **06:50:43 [FG 11]** – Car 4202 on-scene.
- **06:52:35 [FG 11]** – *Accountability Sector* established in front of fire structure.
- **06:53:26 [FD West]** – E28 on-scene.
- **06:57:24 [FG 11]** – S225 on-scene.
- **07:00:12 [FG 11]** – E26’s personnel enters the structure through the front main entrance door and into the basement by means of the interior stairway.
- **07:02:03 [FG 2]** – RAT25’s personnel exits structure by means of the basement exterior door.
- **07:06:41 [FG 11]** – Command announces a change in firefighting strategy from *offensive* to *defensive*.
- **07:07:53 [FG 11]** – Rear sector officer discusses with Command a *marginal* strategy due to E26’s personnel in the basement checking under debris from floor collapse for missing firefighters.
- **07:08:05 [FG 11]** – Capt. Broxterman’s body is located (Figure 3).

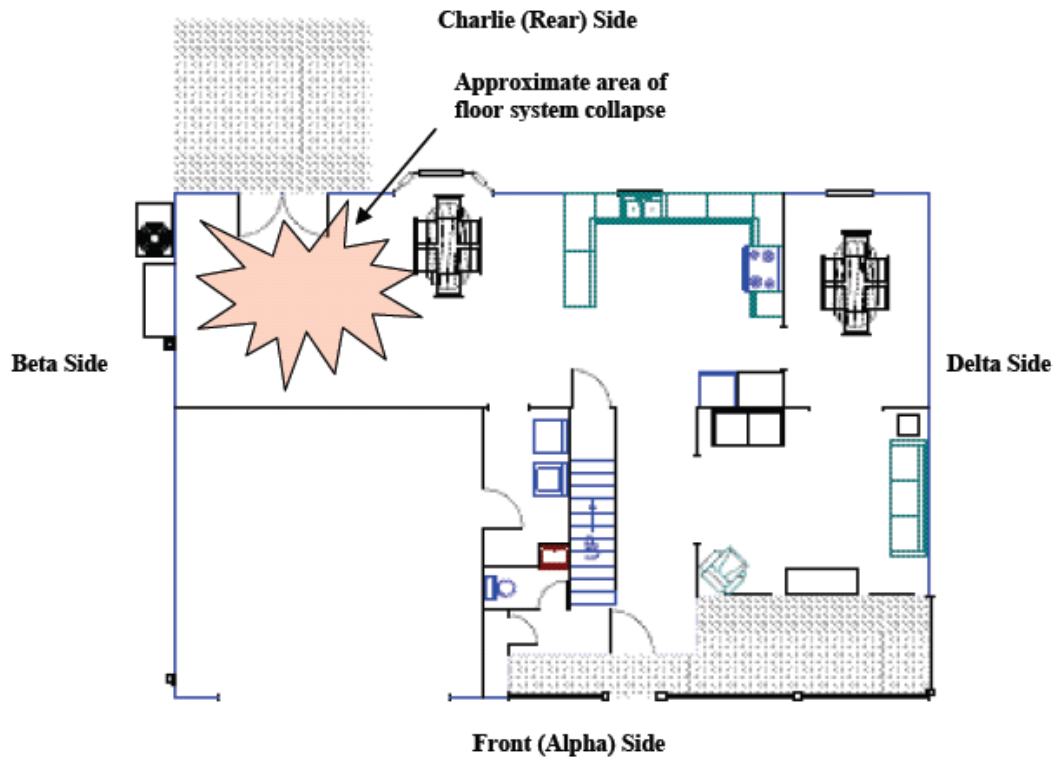
- 07:29:28 [FG 11] – Ffr. Schira's body is located (Figure 3).



*Figure 3: Structure's basement layout indicating location where both deceased firefighters were found.  
(Ohio State Fire Marshal's Office)*

- 07:42:59 [FG 11] – Mayday operations terminated by Command.

During the time period between 06:30:20 and 06:34:20, it is the belief of the committee that one or more catastrophic events occurred within the structure including failure of the flooring system near the *Beta/Charlie* corner of the structure's main floor (Figures 4-6). The photo in Figure 6 was taken from the main level kitchen area near the top of the stairway from the basement looking towards the *Beta/Charlie* corner.



**Figure 4: Structure's main floor layout indicating approximate area of flooring system collapse. (Ohio State Fire Marshal's Office)**



**Figure 5: Interior photo of the collapsed area and flooring system. (Colerain Fire & EMS)**



*Figure6: Expanded interior photo of the collapsed area and flooring system. (Colerain Fire & EMS)*

### INCIDENT STABILIZATION ACTIVITIES

The following summaries have been compiled from statements completed by firefighting and command personnel.

#### **Hamilton County Communications Center**

On the morning of April 4<sup>th</sup>, 2008, an automatic fire alarm activation was received by a Customer Monitoring Center of ADT for the structure located at 5708 Squirrelsnest LN in Colerain Township, Ohio. An ADT representative called the alarm to the HCCC at 06:11:23, which subsequently dispatched the Colerain Fire & EMS. According to the Department's incident response policy, E102 responded to the scene Code 3 (lights and sirens) and E109, L25 and D25 responded Code 2 (with the flow of traffic).

At 06:13:43, the HCCC received a 911 call from the female homeowner by means of the home telephone indicating that there was a fire in the basement. During this call, a smoke detector could be heard sounding in the background. A second phone call from the female homeowner was placed by means of her cellular phone to the HCCC at 06:20:43. This phone call was routed through the City of Cincinnati dispatch center prior to being transferred to the HCCC. This second phone call advised of a working fire in the basement with all occupants evacuating. All Colerain Fire & EMS units were advised of the upgraded situation and the incident was re-dispatched as, "a working structure fire" at 06:22:21 as requested by E109's OIC.

**Engine 102**

E102 received the dispatch at 06:12:45 from HCCC. E102 acknowledged the detail and radioed enroute at 06:13:49. While traveling to the scene, Capt. Broxterman reviewed the map book for the approximate location of the structure and hydrants in the area. As E102 arrived in the area, E102 passed the driveway by approximately 740-feet. Capt. Broxterman reviewed the map book a second time and exited the apparatus to assist the driver in backing the apparatus as addressed in the Department's vehicle backing policies. Capt. Broxterman stopped the vehicle, re-entered the vehicle and reviewed the map book a third time. Capt. Broxterman then exited the vehicle a second time to continue backing procedures. As E102 arrived at the driveway, E109 appeared in the FAO's mirror. At that time, the incident was upgraded to a "working structure fire" by HCCC.

Capt. Broxterman re-entered the cab of E102 and was informed of the update by E109's OIC on FG2 and acknowledged the update. At that time, E102's Ffr. 2 dismounted the vehicle to *street-lay* the five-inch large diameter hose supply line. E102 took a position at the front of the structure after deploying approximately 500-feet of supply hose. Capt. Broxterman radioed "E102 on scene, moderate smoke showing, E102 will be Squirrelsnest Command" to all responding units on FD West at 06:23:45.

As E102 arrived in front of the structure, the FAO was instructed by Capt. Broxterman to interview the male homeowner for the location of the fire and any remaining occupants. Capt. Broxterman exited the vehicle and began to don PPE including self contained breathing apparatus (SCBA). While donning PPE, Capt. Broxterman was advised by the FAO that the fire was in the basement, which Capt. Broxterman acknowledged. Ffr. Schira exited the vehicle and pulled a 150-foot 1¾ -inch pre-connected hose line to the front main entrance door. E102's Ffr. 2 proceeded to walk from the street to the front of the structure along the driveway ensuring the placement of the five-inch supply line didn't impede access for subsequent arriving units.

Capt. Broxterman and Ffr. Schira proceeded to the front main entrance door of the structure, and at 06:26:29 transmitted to the FAO that they were making entry into the structure and requested water. This transmission was not heard by the FAO. During this time, the E102 FAO was completing the five-inch supply line connection into E102's pump utilizing the short section of supply line from the front bumper storage tray of the apparatus. E102's Ffr. 2 proceeded to the front of the structure and *kicked-out* any kinks in the hose line going into the structure then donned an SCBA and entered the structure.

At 06:27:35, Capt. Broxterman transmitted on FG2, "E102 making entry in the basement, heavy smoke." At 06:29:03, E102's Ffr. 2 transmitted a request for water from E102. E102's FAO acknowledged this transmission and stated "...attack line one's getting water now" at 06:29:09. (During this time it is unclear as to the location and activities of E102 interior crew) At 06:29:58, E109's FAO transmitted that the supply line had been connected to the hydrant and was charged.

Just prior to 06:34:20, E102's Ffr. 2 was observed exiting the structure and had a face-to-face conversation with the OIC of RAT25 advising that E102's Ffr. 2 had been separated from the rest of the interior crew of E102. RAT25's OIC relayed this information to Command, and subsequently a Mayday operation was begun by units on the scene.

### **Engine 109**

E109 responded Code 2 according to Colerain Fire & EMS policy to the initial dispatch of an automatic fire alarm activation. The company responded with a crew of four personnel. While enroute, E109's OIC advised responding units on FG 2 that this address was a *long-lay* situation. Upon their arrival on Squirrelsnest, E109's OIC indicated that E102 was visible at the top of the driveway. At this time, HCCC advised units that according to a resident's phone call, the incident was now "a working structure fire". E109's OIC requested this information be re-dispatched by means of HCCC and then called E102's OIC (Capt. Broxterman) to confirm that she was aware that it was now a structure fire. Capt. Broxterman radioed, "Clear".

E109's OIC advised E109's FAO to drive past the driveway, turn around in the next available driveway, and then proceed to the hydrant at 5712 Squirrelsnest LN. As E109 came to a stop at the hydrant, E109's FAO was instructed to complete the hydrant connection with E102's supply line and E109's OIC instructed E109's Ffr.1 to follow E102's supply line down the driveway to further ensure that it was out of the way of other responding units. E109's OIC and Ffr. 2 began assembling their equipment prior to advancing to the structure. At this time, L25 and D25 arrived on the scene and proceeded down the driveway.

E109's OIC performed a face-to-face with Command to discuss further size-up of the structure, and advised that E109's FAO was busy with water supply and to assign accountability to another unit. E109's crew proceeded to the front of the structure performed a 360-degree assessment proceeding in a clockwise manner from the front of the structure. E109's OIC observed heavy fire from the rear of the structure through the basement exterior door and the adjacent window (Figure 7). Upon returning to the front of the structure, E109's OIC instructed E109's Ffr.1 and Ffr. 2 to pull a second 1¾-inch pre-connected hose line from E102 to the rear of the structure.

E109's FAO charged the hydrant and supplied E102 with water at 06:29:58. E109's FAO then proceeded down the driveway to join the remainder of E109's crew at the rear of the structure. E109's OIC advised L25's OIC face-to-face to have E102 interior crew pull out and re-deploy to the rear of the structure. At 06:30:20, E109's OIC radioed Command of changing fire and smoke conditions, and to have E102's crew re-deploy to the rear of the structure for easier access to the basement. Command acknowledged the radio transmission.



*Figure 7: Rear elevations from the Beta /Charlie corner showing the basement exterior door and window.  
(Colerain Fire & EMS)*

E109's crew advanced to the rear of the structure and noticed that the fire coming out of the basement exterior door and window was extending upward on the exterior running along the soffit line. E109's OIC sent E109's Ffr.1 to E102's FAO to request that the second 1¾-inch pre-connected hose line be charged. E109's crew knocked-down the exterior fire in the rear and held position under the supervision of the rear sector officer. While doing so, E109's personnel were instructed not to direct their fire stream into the structure through the open doors or windows.

After RAT25's crew was activated by Command at 06:37:23, E109's crew was met by RAT25's crew coming to the rear preparing to make entry into the basement. E109's crew provided support and fire control for RAT25's operations in the basement. After discovery of the downed firefighters, E109's crew assisted with recovery efforts and was then directed to the *Rehabilitation Sector* in the front of the structure.

### **Ladder 25**

L25 responded Code 2 to 5708 Squirrelsnest LN for the initial dispatch of the automatic fire alarm activation. The company responded with a crew of four personnel. Upon receiving updated information from HCCC that the incident was now "a working structure fire", L25 upgraded their response to Code 3. L25 arrived on the scene at 06:25:23 and drove down the driveway positioning behind E102. As addressed in Colerain Fire & EMS policy, L25's four person crew was divided into two teams. The *Interior Team* consisted of L25's OIC and Ffr.1. The *Exterior Team* consisted of L25's Aerial Truck Operator (ATO) and Ffr. 2.

### L25 Interior Team Activities

L25's Interior Team was directed by Command to advance to the structure to perform a *primary search*. They approached the front main entrance door, assembled their PPE, hand tools and Thermal Imaging Camera (TIC). While they were preparing to make entry, E109's OIC advised all crews of changing fire conditions and advised E102's crew to re-deploy to the rear of the structure. L25's Interior Team attempted to make verbal contact with E102's crew, but was unable to contact them from the front porch or verify their location using the TIC. L25's Interior Team then proceeded to the rear of the structure to assess fire conditions. Upon returning to the front of the structure, the crew did not make entry due to deteriorating conditions. L25's OIC requested positive pressure ventilation (PPV) to be set up at the front main entrance door.

L25's Interior Team then assumed a position in the rear of the structure and came under the supervision of the rear sector officer.

### L25 Exterior Team Activities

L25's Exterior Team proceeded towards the front of the structure with two PPV fans (one from E102 and one from L25). They positioned the fans in the front main entrance doorway, however did not start them until requested. After placement of the fans, L25's Exterior Team proceeded around to the rear of the structure and also fell under the supervision of the rear sector officer. At approximately 06:55:00, there were several requests by means of the radio for the natural gas to be shut-off. L25's Exterior Team radioed that the gas had already been shut-off. L25's Exterior Team remained in the rear of the structure for the remainder of operations.

### **Engine 25**

E25's crew responded with a crew of four personnel as part of the alarm upgrade for a structure fire. While enroute to the scene, E25 was initially assigned accountability by Command. Upon arrival at the scene at 06:30:40, E25's crew proceeded to the front of the structure with necessary tools and RAT equipment. E25's FAO began the accountability process, however, upon hearing radio traffic concerning a possible Mayday, moved forward to join E25's crew. At 06:32:23, E25 was assigned to report to the rear sector by Command. Approximately one minute later, Command re-assigned E25 to assume RAT responsibilities. E25's crew was joined by E25's FAO and made a reconnaissance of structures' exterior four sides in a clockwise manner. After returning to the front yard, E25's OIC encountered E102's Ffr. 2, who reported losing contact with Capt. Broxterman and Ffr. Schira. At 06:34:30, E25's OIC notified Command that E102's crew had become separated and proceeded to set up for RAT operations. At 06:37:23, Command activated RAT25. At 06:41:43, RAT25 advised Command they were entering the rear of the structure through the basement exterior door. R26's two person crew was also assigned to RAT25 at this time. Using a search line, RAT25's crew started a left-handed search pattern through the basement exterior door. Upon reaching the base of the

stairway, the crew found a hose line that was free flowing water from a break in the outer-jacket of the hose. The crew then radioed to have the hose line shut down. This information was also relayed to the rear sector officer by means of face-to-face communications in the rear of the structure.

RAT25 was ordered out of the basement by the rear sector officer due to concerns of possible structural compromise from a sagging first-floor beam. RAT25 exited the structure. After further examination it was determined the beam, in fact was not sagging, then RAT25 re-entered the structure without their Ffr. 2 due to depleting his breathing air supply. They proceeded into the basement following the same search pattern back to the bottom of the stairs. As they proceeded to the top of the stairs, they encountered E26's crew where they exchanged information concerning structural conditions, fire conditions, and which areas had already been searched. At this time RAT25's crew gave E26's crew their TIC camera (E26's TIC had failed), and promptly exited back through the basement due to the crew being low on breathing air. RAT25's crew proceeded around to the front of the structure and was directed to the Rehabilitation Sector.

### **Rescue 26**

At 06:24:25, R26 responded Code 3 with a crew of two personnel according to Colerain Fire & EMS policy when the alarm was upgraded to a structure fire. Upon arrival at the scene, the rescue apparatus operator extended the light tower and then the crew reported to Command's location for assignment. R26 was instructed to report to RAT25's OIC to augment their crew. R26's crew (now part of RAT25) proceeded with the crew to the rear of structure, gave their accountability tags to the rear sector officer and entered the basement exterior door. A left-hand search pattern was conducted and RAT25 discovered a hose line at the bottom of the basement stairs. RAT25 then exited the basement on orders of the rear sector officer. R26's crew was then relieved of RAT duties and instructed to assist with deploying a hose line to the main level rear deck and support L25's crew with extinguishment efforts.

Once on the main level deck, R26's apparatus operator noted the main level floor of the structure had collapsed and notified the rear sector officer of the findings. Extinguishment efforts continued at the Beta/Charlie sides of the structure until radio traffic indicated one firefighter had been found. R26 and L25 crews were then instructed to help extricate and recover the second firefighter from the basement. R26 and L25 crews became low on breathing air and exited the structure. R26's crew assisted in moving a *stokes basket* to the front of the structure, and was then directed to the Rehabilitation Sector.

### **Engine 26**

At 06:34:07, while in quarters, E26 contacted Command on FG2 and asked if they should respond to the incident. Command advised them to respond. E26 responded with a crew of four personnel Code 3 to the scene and arrived on scene at 06:45:35. E26's crew assembled in the

front yard and upon receiving orders to search for E102's crew, proceeded through the front main entrance door, and followed the initial pre-connected hose line down the main hallway and into the kitchen. E26's crew encountered RAT25 at the top of the basement stairway and was briefed on structural and fire conditions and areas that had already been searched. A partial collapse of the main level flooring system was also discovered in the Beta/Charlie area by E26's crew. E26's crew proceeded to the basement. After a brief search Command ordered a shift to a defensive mode, signaling all interior crews to exit the structure due to safety concerns. E26's OIC requested permission from the rear sector officer to rapidly search the area underneath the collapsed area. With permission granted, E26 entered the area and began moving debris. E26's crew discovered pieces of PPE, which led them to the location of the first firefighter. They reported their findings to the rear sector officer and left the downed firefighter in place for investigational purposes while they exited the structure by means of the rear basement exterior door. E26's OIC had a face-to-face conversation with Car 2501 (Fire Chief) at the *Command Post* and after several minutes, E26 was instructed to re-enter the structure and recover the firefighter's body. While doing so, they found the second firefighter underneath the first firefighter. During the recovery of the first firefighter, members of E26 began to run low on breathing air and exited the structure. Upon exiting, E26's crew provided location directions to the relief crew that was entering to remove the second firefighter. E26 then reported to the Rehabilitation Sector.

**District 25 (Battalion Chief Officer)**

D25 responded to 5708 Squirrelsnest LN Code 2 according to Colerain Fire & EMS response policy. As the incident was upgraded to a structure fire, D25 upgraded the response to Code 3. Upon arrival at 06:26:18, D25 assumed a position behind L25, and then assumed Command.

Command received the original on-scene size-up from Capt. Broxterman and then additional information from L25's OIC that there was a "working fire" inside the structure. Command radioed that he was having a difficult time seeing the structure due to the positioning behind the ladder truck.

As the incident evolved, Command directed units in fire attack and scene support. After receiving an update from E109's OIC to have E102's crew redeploy to the rear of the structure, Command attempted to have E102 acknowledge the change in tactics at 06:30:20. Having received no response after repeated attempts, Command began to suspect that E102's crew was in trouble.

Command activated RAT25's crew at 06:36:30 and declared a Mayday situation at 06:37:23 on FG2 followed by a request for a second alarm and staff notification from HCCC. Command instructed all firefighting operations to change fire ground channels to FG11 in order to clear FG2 for Mayday operations.

Car 2501 arrived on scene and assumed *Operations Command* on FG11 so that D25 could concentrate on RAT operations. From this point, D25 continued to manage the Mayday operations on FG2 until the Mayday operation was terminated at 07:42:59.

### **Car 2508 (Division Chief Officer)**

At 06:27:21, Car 2508 arrived on scene and reported to Command for assignment. Car 2508 was assigned as the rear sector officer and proceeded to the rear side of the structure. At 06:31:58, the rear sector officer reported fire showing out the rear windows. The rear sector officer conferred with E109's OIC and requested permission from Command to knock down exterior fires. The rear sector officer instructed the rear sector crew not to direct fire streams into structure. E109's crew proceeded to knock-down the exterior fire. No indication of interior fire suppression efforts were noted at any time.

Between 06:33:41 and 06:35:01, there were several radio transmissions between Command and the rear sector officer inquiring about the status and location of *Interior One* (E102). The rear sector officer radioed that there had not been any contact with the interior crew. Command acknowledged the traffic and instructed the rear sector officer to begin interior suppression and entry. RAT25 was activated by Command at 06:36:30.

From a position in the rear of the structure, the rear sector officer directed the initial RAT operations and suppression efforts. The rear sector officer observed a possible compromised structural beam, and ordered RAT25 out of the structure. The rear sector officer determined the structure was safe and RAT operations continued. The rear sector officer continued to keep a physical accounting of the rear sector suppression and RAT crews throughout the incident until accountability was formally established by Car 2506 (Division Chief Officer).

At approximately 07:05:00, E26's crew communicated with the rear sector officer and reported an area on the Beta/Charlie side of the structure's interior first-floor had collapsed into the basement. At 07:06:41, Command had called for defensive operations while E26's crew received permission from the rear sector officer to quickly check under the debris on side *Charlie*. At 07:08:42, the rear sector officer informed Command that E26 had found a downed firefighter.

The remnants of a helmet and SCBA were passed outside and placed on a table; the rear sector officer instructed that nothing was to be touched in an effort to preserve evidence. The rear sector officer continued to provide direction and oversight during the recovery efforts inside the basement. The rear sector was re-assigned to units from Ross Township Fire Department after the recovery, and Car 2508 was directed to the Rehabilitation Sector.

### POST-INCIDENT ACTIVITIES

In an effort to prevent serious injury and fatal firefighter incidents in the future, Colerain Fire & EMS has already initiated action with the following activities:

- Continued comprehensive review of structural firefighting tactical procedures – especially those involving basement fires;
- Enhanced support staff and command officer notification and response procedures;
- Supplemented first-alarm structure fire complement with an additional ladder company;
- Continued comprehensive review and modification to RAT response and operational procedures;
- Purchased additional thermal imaging cameras;
- Recommend the purchase of radio headsets for FAO personnel;
- Review of radio communication procedures;
- Research improved SCBA and portable radio interface technology;
- Review and expansion of General Operating Guidelines and Procedures Manual;
- Continued training in the department's Accountability System;
- Continued training in Incident Management and the Incident Command Simulator;
- Continued evaluation of personnel for Critical Incident Stress.

This is not an all-inclusive listing of activities. Additional items are expected to be identified in both the future comprehensive document and the NIOSH report.

### CONCLUSION

The information contained within this document is only the first phase in a process of identifying and implementing measures that are intended to prevent the risks of similar events within Colerain Twp. Fire & EMS and the fire service profession. The final document scheduled for release in 2009 will introduce recommendations and provide a framework for strengthening firefighter safety and survival awareness within Colerain Township's Fire Department.

While we believe that this preliminary document and the future comprehensive document will be helpful to this fire department, it is the more global information drawn from our experience that will enable the fire service to implement safety measures that will benefit all firefighters.

The Department will never forget the ultimate sacrifice made by Captain Robin Broxterman and Firefighter Brian Schira in their service to the community. By sharing the knowledge gained from this very tragic and painful incident, the Department will ensure their sacrifice was not in vain and hope that other fire departments can avoid a similar tragedy.

### TERMINOLOGY

This section is intended to assist the reader to understand terms used in describing aspects of firefighting and common to Colerain Fire & EMS.

Accountability Name Tag: a plastic, Velcro-backed tag with a firefighter's rank (if appropriate), last name and badge number.

Accountability System: the system that readily identifies both the location and function of all personnel operating at an incident scene.

Battalion Chief Officer: manages all activities of all personnel on an *assigned shift* in the Operations Bureau, including commanding and coordinating firefighting and rescue functions; duty assignment, supervision, and evaluation of personnel.

Defensive strategy: actions that are intended to control a fire by limiting its spread to a defined area, avoiding the commitment of personnel and equipment to dangerous areas.

Division Chief Officer: supervises, plans, and coordinates the activities and operations of an *assigned section*; coordinates assigned activities with other sections and divisions, outside agencies, and the general public.

Engine Company: the standard fire attack apparatus containing a water supply, attack and supply hose lines, pump, and related equipment; staffed by three to four firefighters.

Fire Apparatus Operator: a firefighter responsible for driving the engine to the scene of an incident and operation of the pumps on an engine, to provide sufficient water to the firefighters on the hose.

Ladder Company: the standard fire attack apparatus equipped with an aerial device, ground ladders, forcible entry tools, and related equipment; staffed by four to five firefighters.

Incident Commander: the fire department representative in overall command of an emergency incident.

Long-Lay: a driveway on an occupant's property in Colerain Township that is 900-feet or greater from a fire hydrant or any other water source used for fire protection. In addition, a structure less than 900-feet that is not visible from the street is also considered a long-lay. The preplanning of long driveways providing firefighters with information regarding the number of engine companies that will be required to deploy enough supply hose to reach an incident address in case of a fire emergency.

Marginal strategy: sometimes referred to as transitional or rescue strategy focusing on saving of human life. Charged hose lines are advanced for the purpose of supporting rescue and protecting crews, not for fire extinguishment

Mayday: a term used only by firefighters who are lost, trapped or in a life threatening situation.

Offensive strategy: actions generally performed in the interior of involved structures that involve a direct attack on a fire to directly control and extinguish the fire.

Passport: a small plastic card that identifies the fire company designation. A strip of Velcro affixed to each passport allows individual nametags to be placed on each passport that reflects the individual crewmembers who are assigned or working on a particular fire company or unit that day.

Personal Alert Safety System: a personal safety device used primarily by firefighters entering a hazardous environment such as a burning building, which sounds a loud audible alert to notify others in the area that the firefighter is in distress.

Positive Pressure Ventilation: a method used to pressurize a fire structure during an interior attack to control smoke and heat ventilation at desired points.

Primary Search: a very early in any fire or hazardous environment search or rescue. This is a quick search of all compartments in a structure for victims.

Rapid Assistance Team (RAT): a minimum of three fully equipped firefighting personnel on-site, in a ready state, for the immediate rescue of lost, trapped or incapacitated firefighter(s).

Rescue Company: a special fire or rescue apparatus equipped with rescue tools and related equipment; staffed by two firefighters.

Sector: is a geographical area or function established and identified within the incident management system for operational purposes. A typical designation of sectors might include: a) rear sector, b) interior sector, c) roof sector, d) rehabilitation sector.

Squad Unit: the standard vehicle used for basic life support and treatment and transportation of the sick or injured.

## APPENDIX A continued

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# **APPENDIX B**

## **National Institute of Occupational Safety and Health Firefighter Fatality Report**



## APPENDIX B

### National Institute of Occupational Safety and Health Firefighter Fatality Report



**NIOSH**  
Fire Fighter Fatality Investigation  
and Prevention Program

## Death in the line of duty...

*A Summary of a NIOSH fire fighter fatality investigation*

*July 29, 2009*

### A Career Captain and a Part-time Fire Fighter Die in a Residential Floor Collapse—Ohio

#### SUMMARY

On April 04, 2008, a 37-year-old female career captain and a 29-year-old male part-time fire fighter were fatally injured when a section of floor collapsed and trapped them in the basement during a fire at a residential structure. At 0611 hours, an automatic alarm dispatched the fire department. Dispatch upgraded the alarm to a working structure fire 9 minutes later. At 0623 hours, the victims' engine was the first to arrive on scene. The homeowner met the engine crew and stated that the fire was in the basement and everyone was out. With moderate smoke showing, the captain and the fire fighter donned their self-contained breathing apparatus and entered the residence through the opened front door with a 1¾" hoseline. A second fire fighter joined the captain and fire fighter at the basement stairs doorway. After the captain called for water several times, the line was charged and both fire fighters took the hoseline to the bottom of the stairs but needed additional hoseline to advance. The second fire fighter went back up the stairs to pull more hose at the front door. As he returned to the basement stairway, he saw the captain at the top of the stairs, trying to use her radio and telling him to get out. A captain from the second arriving engine noticed the smoke getting black, heavy, and pushing out the front door and requested the incident commander (IC) to evacuate the interior crew. The second fire fighter exited the structure alone. The IC made several attempts to contact the interior crew with no response. At 0637 hours, the IC sent out a "Mayday." A rapid intervention team was activated and followed the hoseline through the front door and down to the basement. Returning to the first floor, they noticed a collapsed section of floor and went to investigate the debris in that area of the basement. At 0708 hours, the captain was found near a corner of the basement. At 0729 hours, after removing debris from around the captain, the other fire fighter was located underneath her and some additional debris. Both victims were pronounced dead at the scene.

Key contributing factors identified in this investigation included that the initial 360-degree size-up was incomplete, likely disorientation of victims effecting key survival skills, radio communication

The National Institute for Occupational Safety and Health (NIOSH), an institute within the Centers for Disease Control and Prevention (CDC), is the federal agency responsible for conducting research and making recommendations for the prevention of work-related injury and illness. In fiscal year 1998, the Congress appropriated funds to NIOSH to conduct a fire fighter initiative. NIOSH initiated the Fire Fighter Fatality Investigation and Prevention Program to examine deaths of fire fighters in the line of duty so that fire departments, fire fighters, fire service organizations, safety experts and researchers could learn from these incidents. The primary goal of these investigations is for NIOSH to make recommendations to prevent similar occurrences. These NIOSH investigations are intended to reduce or prevent future fire fighter deaths and are completely separate from the rulemaking, enforcement and inspection activities of any other federal or state agency. Under its program, NIOSH investigators interview persons with knowledge of the incident and review available records to develop a description of the conditions and circumstances leading to the deaths in order to provide a context for the agency's recommendations. The NIOSH summary of these conditions and circumstances in its reports is not intended as a legal statement of facts. This summary, as well as the conclusions and recommendations made by NIOSH, should not be used for the purpose of litigation or the adjudication of any claim. For further information, visit the Program Website at [www.cdc.gov/niosh/fire](http://www.cdc.gov/niosh/fire) or call toll free 1-800-CDC-INFO (1-800-232-4636).

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problems, well-involved basement fire before the department's arrival, and potential fire growth from natural gas utilities.

NIOSH investigators concluded that, to minimize the risk of similar occurrences, fire departments should

- *ensure that standard operating procedures (SOPs) for a 360-degree size-up are followed*
- *ensure that fire fighters are sufficiently trained in survival skills*
- *develop SOPs and train on the specific hazards of fighting basement fires to include ingress/egress points, flashover, and structure collapse*
- *ensure that radio operability guidelines follow best practices recommended by the International Association of Fire Chiefs*
- *ensure that thermal imaging cameras (TICs) are used to help assess interior conditions and potential structural damage*
- *ensure that SOPs for offensive operations are followed, such as, cutting utilities to the fire structure*

Although there is no evidence that the following recommendations would have prevented these deaths, they are being provided as a reminder of good safety practices.

- *ensure that interior attack crews advance with a charged hoseline*
- *consider dispatch information regarding the call, such as fire location and if the building's occupants have exited the structure*

Additionally, first responder radio manufacturers, research/design facilities and standard setting bodies should continue research and efforts to

- *improve radio system capabilities*
- *refine existing and develop new technology to track the movement of fire fighters inside structures*

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### INTRODUCTION

On April 04, 2008, a 37-year-old female career captain and a 29-year-old male part-time fire fighter were fatally injured when a catastrophic structure failure occurred and a section of floor collapsed and trapped them in the basement. On April 04, 2008, the fire department notified the National Institute for Occupational Safety and Health (NIOSH) of these fatalities. On April 7–9, 2008, a general engineer from the NIOSH Fire Fighter Fatality Investigation and Prevention Program investigated the incident scene and photographs were taken. A preliminary meeting was conducted with the department's assistant chief of administrative services (investigating team leader) and an International Association of Fire Fighter's union representative. On April 21–25, 2008, a general engineer and a safety and occupational health specialist from the NIOSH Fire Fighter Fatality Investigation and Prevention Program conducted interviews with officers and fire fighters who were at the incident scene. The NIOSH investigators reviewed the department's standard operating guidelines, training records of the incident commander and both victims, photographs of the incident scene, written witness statements, dispatch audio transcripts, the coroner's reports, and the fire department's preliminary report, and met with a county communication center support specialist. Photographs were taken of the self-contained breathing apparatus (SCBA) and turnout gear. The SCBAs and personal alert safety system (PASS) devices used by the victims were too damaged to be tested by NIOSH.

### FIRE DEPARTMENT

The department has five stations with 60 full-time and 150 part-time career fire fighters serving a population of over 60,000 residents in a geographic area of approximately 45 square miles. The fire department has established standard operating procedures (SOPs) and protocols that are employed in establishing command and providing safety for personnel. An SOP specific to basement fires did not exist.

### TRAINING/EXPERIENCE

The fire department supports and encourages fire fighter training. They provide periodic training on numerous technical areas of fire fighter safety and survival awareness. The fire department records and maintains all training records on each fire fighter.

The captain (Victim #1) had 17 years career fire fighting experience and had completed Fire Fighter 1 and 2, multiple levels of EMT training, HazMat Operations, Fire Safety Inspector, Fire Instructor, and numerous public safety courses.

The fire fighter (Victim #2) had 4 years reserve fire fighting experience and had completed Fire Fighter 1 and 2, Basic EMT, HazMat Operations, Incident Safety Officer, Leadership I, Introductory and Level 200 Incident Command System, Introduction to National Incident Management System (NIMS), and various other administrative and technical courses.

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The incident commander (battalion chief) had over 19 years of career fire fighting experience and had completed Fire Fighter 1 and 2, Fire Instructor, Fire Safety Inspector, Paramedic, Introductory and Level 200 ICS, Introduction to NIMS, National Incident Management System training, various Fire Tactics training, various levels of Hazardous Materials training, Building Construction, and numerous other administrative and technical courses.

*Note: Fire Fighter 1 and 2 training are equivalent to NFPA 1 and 2.*

### PERSONAL PROTECTIVE EQUIPMENT

At the time of the incident, the captain and the fire fighter were wearing a full array of personal protective equipment consisting of turnout coat and pants, gloves, helmet, hood, boots, and SCBA with an integrated PASS device (compliant with the 2002 edition of NFPA 1982) and each carried a portable digital radio with a lapel microphone. Note: No PASS devices were heard during the search but Victim #1's PASS was chirping when debris was cleared and the device was no longer covered.

### APPARATUS, PERSONNEL, AND ON SCENE ARRIVAL TIMES

#### **0623 hours**

Engine #102 [E102]—captain (Victim #1), engineer, and two fire fighters (Victim #2 and FF#1)

#### **0625 hours**

Engine #109 [E109]—captain (C#1), engineer, and two fire fighters

#### **0626 hours**

Ladder #25 [L25]—captain (C#2), engineer, and 2 fire fighters

Car #25 [C25]—battalion chief (incident commander (IC))

#### **0627 hours**

Car #2508 [C2508]—division chief ((DC#1) assigned as rear sector officer)

#### **0630 hours**

Engine #25 [E25]—captain, engineer, and 2 fire fighters (assigned as first Rapid Intervention Team (RIT))

#### **0632 hours**

Rescue #26 [R26]—captain and a fire fighter

#### **0634 hours**

Squad #25 [S25]—two fire fighter/paramedics

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##### **0643 hours**

Car #2506 [C2506]—division chief ((DC#2) assigned as accountability officer)

##### **0644 hours**

Car #2501 [C2501]—fire chief (assumed fireground suppression operations after RIT activation)

##### **0645 hours**

Engine #26 [E26]—captain (C#3), engineer, and 2 fire fighters (assigned as second RIT)

##### **0650 hours**

Car #2512 [C2512]—battalion chief (assisted with accountability)

Car #2514 [C2514]—division chief ((DC#3) assigned as front sector officer)

Car #4202 [C4202]—assistant chief (assigned to rear RIT operations)

### **BUILDING INFORMATION**

The fire structure was a 1991, two-story, single-family home of approximately 2,050 square feet (see Photos 1 and 2). The home was of traditional wood framing with a brick veneer. Vinyl siding covered the second floor B-, C-, and D-side walls and the gables. The gable roof was covered with traditional asphalt shingles. The structure had a poured concrete foundation with a finished walkout basement in the rear (C-side) (see Diagram 1). The first floor area that sustained the structural failure was comprised of 2"x10" wood joists on 16" centers with ¾" oriented strand board as the subfloor and was covered with carpet (see Diagram 2).

The home had natural gas forced air heat. During the investigation, it was noticed that the gas line (standard black iron pipe) to the furnace was missing some type of short connector (see Photo 3). The upper section of the main gas line in the house was weighted down from the collapse. When the pipe was at its original height a connector (approximately 2") was missing. The pipe threads on both remaining ends of pipe were relatively clean. If the missing connector was made of a flammable material it would have been completely destroyed during the fire. Unfortunately, there was not enough information to speculate what type of connector was missing.

The home was near the bottom of the hill resulting in a 450-foot driveway to the main street where a fire hydrant was located (see Diagram 3).

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**Photo 1. Fire structure, a two-story single-family residence (A-side). The 1 $\frac{3}{4}$ " hoseline is shown lying in the yard and going through the front door.**  
*(NIOSH photo)*

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**Photo 2.** Fire structure showing rear (C-side) ingress and egress points on two decks.  
(NIOSH photo)

### **WEATHER**

The weather the morning of April 4<sup>th</sup> was overcast with light rain and a temperature of approximately 58 degrees F. The winds were out of the south-southwest at 9 miles per hour (mph) with gusts up to 17 mph. The winds did not seem to significantly impact fire growth.

### **INVESTIGATION**

On April 04, 2008, a 37-year-old female career captain and a 29-year-old male part-time career fire fighter were fatally injured when a catastrophic structure failure occurred and a section of floor collapsed and trapped them in the basement. At 0611 hours, an automatic alarm dispatched the fire department. While en route, 9 minutes later, dispatch upgraded the alarm to a working structure fire. At 0623 hours, Engine #102 (E102) was the first to arrive on scene with a captain (Victim #1), engine operator, and two fire fighters (Victim #2 and FF#1). After some confusion and driving past the

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driveway, the E102 crew then laid a 5" supply line down the 450-foot driveway. E102's engine operator was met by the homeowner stating that the fire was in the basement and everyone was out. Additionally, the excited homeowner directed the captain to the front door and indicated where the basement stairway was located. *(Note: The actions of the homeowner may have distracted the first arriving crew from doing a proper size-up.)* The engine operator relayed that information to the captain. A 1¾" hoseline was stretched to the front door with moderate smoke in the doorway.

At 0625 hours, Engine #109 (E109) arrived on scene and established E102's water supply at the hydrant on the main road. At 0626 hours, Ladder #25 (L25) and a battalion chief in District Car #25 (D25) arrived on scene and staged in the driveway (see Diagram 3). D25 assumed incident command. E109's captain (C#1) informed command that he could not assume taking accountability because he was busy with establishing the water supply. L25 was assigned a search sector and prepared their crew to enter the structure behind E102's interior crew.

Donning their SCBA, Victims #1 and #2 entered the residence through the opened front door. After kicking out kinks in the 5" supply, FF#1 joined the victims at the basement stairs doorway (see Diagram 2). Victim #1 made several attempts calling for water but was not heard by the pump operator; FF#1 radioed for water and was heard. Once the line was charged both Victim #2 and FF#1 took the hoseline to the bottom of the stairs. Reaching the bottom of the stairs, they both felt heat and saw a glow to their left. Needing additional hoseline to advance, FF#1 went back up the stairs passing Victim #1 near the bottom of the stairs. FF#1 pulled about 3 feet of hoseline at the basement door then went to the front door to pull more hoseline.

L25's captain (C#2) and crew member, with a thermal imaging camera (TIC) in hand, went to the front door and pointed it down the hallway. The TIC registered a white screen indicating very hot temperatures. C#2 stepped inside the fire structure about 5 feet and could hear Victim #1 giving orders. C#2 backed out and went over to C#1 at the A/D corner. Both captains agreed that things were getting bad and E102's crew needed to get out and go to the rear to make entry. C#2 went to the front door and yelled through his mask, and C#1 radioed E102 to get out and go to the rear, but received no response.

At 0627 hours, a division chief (DC#1) in Car #2508 arrived on scene. DC#1 reported to command and was assigned rear sector officer and proceeded down the D-side of the fire structure. DC#1 met up with E109 and L25 crew members who were stretching a 1¾" hoseline down the D-side of the house to the rear. At the rear (C-side), DC#1 reported fire through the basement and first floor windows melting the vinyl siding and traveling in a v-shape to the top floor. The E109 crew knocked down the exterior fire in an attempt to keep the fire out of the top floor and attic. At this time, fire in the basement was heavy and command asked DC#1 if they had verbal or visual contact with the interior crew. DC#1 replied that they had neither form of contact.

At 0630 hours, Engine #25 (E25) arrived on scene and was assigned as a rapid intervention team (RIT). The E25 crew gathered their gear and tools and staged at the A/D corner of the fire structure.

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After pulling about 10 feet more of hoseline, FF#1 re-approached the basement stairway and saw the captain (Victim #1) at the stairway door trying to use her radio. FF#1 heard Victim #1 calling Mayday, 3 times, but getting a busy tone, then she told him to get out. FF#1 noticed a glow in the kitchen area as he turned to leave and assumed Victim #1 and Victim #2 were following behind him. The captain (C#1) from E109 noticed the smoke getting black, heavy, and pushing out the front door and requested the incident commander (IC) evacuate the interior crew. FF#1 exited the structure as ordered, but once outside, he realized his crew was not behind him. FF#1 re-entered the fire structure to look for his crew. Feeling the heat and seeing fire in the kitchen, he slid down the basement stairs on his bottle, but did not find his crew. Realizing he was alone, he followed the hoseline back out. FF#1 felt a wave of heat hit him in the back before exiting the fire structure. As he entered the front yard through heavy smoke, he reported to the IC that he lost his crew and that Victim #1 was trying to send a Mayday. The IC made several attempts to contact the interior crew with no response.

At 0637 hours, the IC sent out a Mayday and told FF#1 to report to rehab. After the E109 crew knocked down the fire at the basement sliding glass door, a RIT entered the basement with tools and a search line to search for the missing crew toward the A-side of the structure. Other crews brought a 1¾" and 2½" hoseline to the rear to assist in fire control. The RIT reported finding the hoseline at the bottom of the stairs but no crew. DC#1 thought he could see a sagging structural beam and ordered the RIT to evacuate. After determining it was ductwork and not a beam, the RIT went back in.

At 0643 hours, Car #2 506 arrived on scene, and DC#2 was assigned the accountability officer and staged in the front yard. At 0644 hours, Car #2501, with the fire chief, arrived on scene and took over fireground operations on radio channel 11 while the IC handled the RIT operations on radio channel 2. At 0645 hours, Engine #26 arrived on scene and was made a second RIT. DC#2 met the E26 crew and told them to search for the victims. As they followed the hoseline to the basement, C#3 noticed an 18" burn in the right-side of the hoseline, 2 feet from the nozzle. At 0650 hours, Car #2512 with a battalion chief, Car #2514 with a division chief, and Car #4202 with an assistant chief arrived on scene and were assigned accountability, front sector officer, and rear RIT operations, respectively.

As the second RIT returned to the first floor, they encountered the first RIT, and after a brief face-to-face discussion, the C#3 noticed a collapsed section of the B/C section of floor. Also, they noticed a blue flame in the kitchen area of the collapse zone. At 0654 hours, the RIT crew radioed a possible gas-fed fire to the IC. *Note: The fire structure's utilities, both gas and electric, were not shut off or cut until approximately an hour after the fire department's arrival.* The RIT crews went to investigate the debris in that area of the basement.

At 0708 hours, after moving some debris, Victim #1's SCBA was exposed near the B/C corner of the basement. It was determined that the victim was dead on the scene and C#3 told the crew not to move the body. The IC was informed of the location of the body and after some discussion Victim #1 was placed in a stokes basket. At 0729 hours, upon moving Victim #1 and some debris, Victim #2 was located underneath Victim #1 (see Photo 4 and Diagram 1). Victim #2 was also dead at the scene.

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#### **FIRE BEHAVIOR**

The fire department's report stated that the fire was caused by an electrical short in a fan located in a small cedar closet used to cultivate orchids located in the basement (see Photos 5 and 6 and Diagram 1).<sup>1</sup>

Significant fire behavior events/factors were as follows:

- Automatic fire alarm activated at 0611 hours.
- Basement fire reported by homeowner 2 minutes later.
- Twelve minutes from automatic alarm, first engine arrived on scene and reported moderate smoke showing.
- Sixteen minutes from automatic alarm, initial attack crew made entry into basement and encountered heavy smoke.
- Twenty-three minutes from automatic alarm, contact was lost with the victims. *Note: no water on seat of the fire at this time.*
- Forty-three minutes from automatic alarm, RIT reported possible gas fed fire.

According to the fire department's report, an electric fan shorted, causing the fire. The fan was located in a small cedar closet, along the C-side wall about 14 feet from the B/C corner (see Photo 5). As the fire extended up the C-side basement wall, the first floor 2"x10" wood floor joists were directly impacted by the fire and heat (see Photo 6).

The victims exited the basement from the heavy smoke and heat by way of the basement stairs to the first floor. On the first floor, the captain (Victim #1) tried to transmit on the radio and informed FF#1 to get out. FF#1 exited the structure alone following the hoseline. It can only be assumed that the captain (Victim #1) and the fire fighter (Victim #2) became disoriented or felt that the quickest escape from the heat was diagonally across the room to the atrium door (see Diagram 2). This path was above the seat of the fire which had severely damaged the structural integrity of the floor and collapsed.

#### **CONTRIBUTING FACTORS**

Occupational injuries and fatalities are often the result of one or more contributing factors or key events in a larger sequence of events that ultimately result in the injury or fatality. NIOSH investigators identified the following items as key contributing factors in this incident:

- Initial 360-degree size-up was incomplete.
- Likely disorientation of victims effecting key survival skills.
- Radio communication problems.
- Well-involved fire before fire department arrival
- Potential fire growth from natural gas

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#### **CAUSE OF DEATH**

According to the coroner's reports, the cause of death for both victims were burns and inhalation of smoke and superheated and noxious gases. Second-, third- and fourth-degree burns covered 100% of the bodies and the tracheal lining.

#### **RECOMMENDATIONS**

***Recommendation #1: Fire departments should ensure that standard operating procedures (SOPs) for a 360-degree size-up are followed.***

Discussion: The process of conducting a size-up includes the consideration of many factors, which include a 360-degree walk-around and assessment of the type of building construction, location of doors and access to the structure, occupancy and contents of the structure, location of the fire in the structure, time of day and weather conditions, time of the alarm, and day of the week.<sup>2</sup> A complete size-up of a fire incident assists the IC in determining needed and available resources and developing a sound strategy prior to making an offensive, interior attack which increases safety risks for fire fighters.<sup>3</sup>

In this incident, the first arriving engine crew was met by an excited homeowner who informed them that the fire was in the basement and directed them to the front door and down the stairs. Acting quickly, the engine crew prepared to enter the fire structure without conducting an initial size-up. An initial size-up may have identified a better access (the walk-out sliding door) to the basement and reduced the possibility of fire underneath the fire fighters. A basement fire is one of the most dangerous situations fire fighters can face. Alternate egress routes should be considered before committing to an offensive basement attack.

***Recommendation #2: Fire departments should ensure that fire fighters are sufficiently trained in survival skills.***

Discussion: Fire fighters must act promptly when they become lost, disoriented, injured, low on air, or trapped.<sup>4-8</sup> First, they must transmit a distress signal while they still have the capability and sufficient air. The fire fighter should provide as much information about their location as possible to aid the RIT in locating them. The next step is to manually activate their PASS devices. To conserve air while waiting to be rescued, fire fighters should try to stay calm and avoid unnecessary physical activity. They should survey their surroundings to get their bearings, determine potential escape routes and stay in radio contact with incident command and rescuers. Additionally, fire fighters can attract attention by maximizing the sound of their PASS device (e.g., by pointing it up in an open direction), pointing their flashlight toward the ceiling or moving it around, or using a tool to make tapping noises.

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A crew member or other fire fighter who recognizes a fellow fire fighter is missing or in trouble should quickly try to communicate with the fire fighter via radio and, if unsuccessful, initiate a Mayday for that fire fighter, providing relevant information as described above.

Hoselines can be the last line of defense and the last chance for a lost firefighter to find egress from a burning building. According to the *USFA Special Report: Rapid Intervention Teams and How to Avoid Needing Them*, the basic techniques taught during entry level fire fighting programs describe how to escape a zero-visibility environment using only a hoseline.<sup>9</sup> However, as years elapse from the time of basic training, fire fighters may overlook this technique. Exiting a structure in zero visibility utilizing a hoseline should become second nature for a fire fighter. A fire fighter operating on a hoseline should search along the hose until a coupling is found. Once found, the fire fighter can “read” the coupling and determine the male and female ends. The IFSTA manual *Essentials of Fire Fighting* teaches that the female coupling is on the nozzle side of the set and the male is on the water side of the set. In most cases, the male coupling has lugs on its shank while the female does not (see Diagram 4). Once oriented on the hose, fire fighters can follow the hoseline which will take them toward the exit.<sup>10</sup>

There are a number of ways that a hoseline can be marked to indicate the direction to the exit, including the use of raised arrows and chevrons that provide both visual and tactile indicators. Fire departments may use a variety of techniques to train fire fighters on how to identify hoseline couplings and the direction to the exit, based on the model of hose used by the department. The key point is that this training needs to be conducted and repeated often so that fire fighters are proficient in identifying the direction to the exit in zero visibility conditions while wearing gloves, with the hose entangled, and with various obstructions present. This procedure should be incorporated into SOPs, trained upon, and enforced on the fireground.

It is critical for fire fighters to understand when to self-rescue and when to stay in a location to be rescued. Fire departments should provide periodic refresher training to ensure fire fighters can effectively apply this training in different scenarios. In this incident, the victims left the hoseline and unknowingly traveled across a fire-damaged floor.

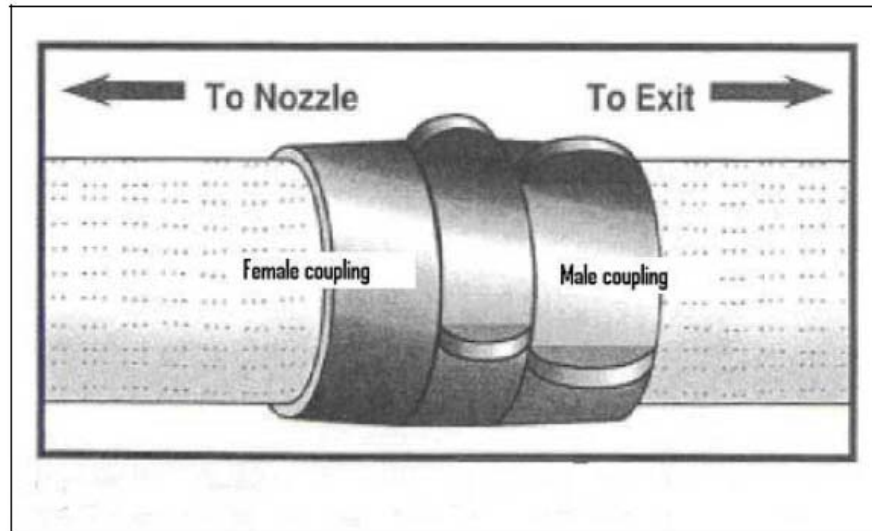
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**Diagram 4.** Hose couplings will indicate the direction toward the exit.  
Adapted from IFSTA Essentials of Fire Fighting, 5th Edition  
Reprinted with permission of IFSTA

**Recommendation #3:** Fire departments should develop SOPs and train on the specific hazards of fighting basement fires to include ingress/egress points, flashover, and structure collapse.

Discussion: Standard operating procedures (SOPs) should be developed addressing structural fire fighting operations specific to basement fires. Basement fires present a complex set of circumstances, and it is important that SOPs are developed and followed to minimize the risk of serious injury to fire fighters. Fire can quickly spread upward into the structure causing potential problems such as a flashover, backdraft, or weakening of the structure. The basement stairway may act as a chimney, drawing fire and hot gases upward. Fire fighters using the stairway as their main egress may be endangered by this chimney effect. Basements that have a ground-level or walk-out ingress/egress make it considerably safer than working above the fire floor and should be utilized to reduce risks to the fire fighter. Properly ventilating the heat and smoke from buildings can reduce the possibilities of potentially hazardous situations for fire fighters. To coordinate their efforts, fire fighters performing ventilation tasks should be in communication with the fire fighters attacking the fire or entering the structure. SOPs for fighting basement fires should be included in the overall risk management plan for the fire department. If these procedures are changed, appropriate training should be provided to all affected members.



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***Recommendation #4: Fire departments should ensure that radio operability guidelines follow best practices recommended by the International Association of Fire Chiefs.***

Discussion: The fireground communications process combines electronic communication equipment, a set of standard operating procedures, and the fire personnel who will use the equipment. To be effective, the communications network must integrate the equipment and procedures with the dynamics of the incident site, especially in terms of the environment and the human factors affecting its use. The ease of use and operation of established communication procedures may well determine how consistently fire fighters monitor and report conditions and activities over the radio while fighting fires. Fire departments should review both operating procedures and human factors issues to determine the ease of use of radio equipment on the fireground which is essential to ensuring that fire fighters consistently monitor radio transmissions from the IC and respond to radio calls.<sup>11</sup> The need to have equipment operate properly during fire operations is critical.

In this incident, the engine operator could not initially hear the call for water over the ambient noise of the apparatus. Also, when Victim #1 tried to transmit (at least three times) what is believed to have been a Mayday, it was not heard or understood. The incorporation of radio headsets may have improved communications. The International Association of Fire Chiefs has released an interim report concerning possible communications problems involving digital two-way portable radios in close proximity to common fireground noise.<sup>11</sup> This report includes recommendations and best practices, such as the IC should assign an aide to assist in communication capabilities in a high noise environment, consider location of radios and microphones in relationship to noisy equipment, and shield microphones from noise to improve intelligibility.

***Recommendation #5: Fire departments should ensure that thermal imaging cameras (TICs) are used to locate the seat of the fire.***

Discussion: A thermal imaging camera (TIC) can be a useful tool in detecting if ceilings and floors have become dangerously weakened by fire damage and are threatening to collapse. A fire fighter about to enter a room or structure can use a TIC to assist in judging if fire or hot gases are in the walls, attic, or void spaces. The use of a TIC may also provide additional information the incident commander can use during the initial size-up. TICs should be used in a timely manner, and fire fighters should be properly trained in their use and be aware of their limitations.<sup>10</sup>

In this incident, a TIC was not utilized in the fire structure to locate the seat of the fire by the interior attack crew. E102 was the reserve engine and was not equipped with a TIC; however, L25 had a TIC on board. The L25 crew used a TIC at the front door and determined it was not safe to make entry after the initial attack crew had entered.

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***Recommendation #6: Fire departments should ensure that SOPs for offensive operations are followed, such as cutting utilities to the fire structure.***

Discussion: During an offensive attack, fire fighters are responsible for a wide range of important tasks, such as primary search, rescue, and forcible entry; checking for fire extension; ventilating; accessing concealed/void spaces; control of utilities; and laddering the building. To conduct these tasks, fire fighters need to carry the proper tools, e.g., TIC, utility bar, pike pole, axe. It is critically important to properly staff companies that are charged with these duties. Safety and control dictate that operating units work as groups. Given the variety of tasks, and that many of these tasks can be performed by two-member teams, it may be necessary to split into separate crews.<sup>3</sup> At a working structure fire, two members may be required to conduct primary search, while a second two-member crew may locate and cut utilities. SOPs should clearly identify which crews are responsible for each critical task.

In this incident, the fire structure's utilities, both gas and electric, were not shut off or cut until approximately an hour after the fire department's arrival. At 0630 hours, the utility company was contacted, but they did not have an estimated time of arrival. During RIT operations a blue flame was noticed near the D-side of the collapsed area indicating a possible gas-fed fire. At 0654 hours, the RIT crew radioed a possible natural gas-fed fire.

*Although there is no evidence that recommendations #7 and #8 would have prevented these deaths, they are being provided as a reminder of good safety practices.*

***Recommendation #7: Fire departments should ensure that interior attack crews advance with a charged hoseline.***

Discussion: Successful fire suppression and fire fighter safety depends upon discharging a sufficient quantity of water to remove the heat being generated and provide safety for the interior attack crews. When advancing a hoseline into a fire structure, air should be bled from the line once it is charged and before entering the structure.<sup>10</sup> To ensure successful interior attacks, fire fighters should continually train in establishing a water supply, proper hose deployment, and advancing and operating hoselines.

In this incident, the victims made entry and did not call for water until they were at the basement door. The captain (a victim) made several radio calls for water but wasn't heard by the engine operator because of the engine noise. FF#1 made a radio transmission that was received and the hoseline was charged. When the RIT was activated charged back-up lines were in place.

***Recommendation #8: Fire departments should consider dispatch information regarding the call, such as fire location and if the building's occupants have exited the structure.***

Discussion: Often a homeowner may divulge or a dispatcher may ask for information that can be passed on to the responding fire department so that they can better plan their attack strategy.

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Information given by the caller or asked by the dispatcher, such as anything unique about the location of the fire structure, if the structure is occupied, and possible location of the seat of the fire can be passed on to the arriving units and speed up the response time and influence the tactics to be employed.

In this incident, the fire structure was located at the end of a long 450-foot driveway and was hidden by structures and trees closer to the main road. The arriving apparatus initially passed the driveway and they were not expecting to have a long hose lay. The structure was unoccupied and the fire originated in the basement which adds inherent danger to fire fighters. Often basements are used for storage resulting in a high fuel load and/or are altered for additional living space making it a maze. Committing an attack crew above the fire floor or into a basement requires tactics to be well thought out.

***Recommendation #9: First responder radio manufacturers, research/design facilities and standard setting bodies should continue research and efforts to improve radio system capabilities.***

Discussion: The use of personal protective equipment and an SCBA make it difficult to communicate, with or without a radio.<sup>12,13</sup> Several NIOSH Fire Fighter Fatality Investigation Reports have cited issues with portable radio communication, and the International Association of Fire Chiefs has released an interim report concerning possible communications problems involving digital two-way portable radios in close proximity to common fireground noise.<sup>11</sup>

To facilitate communication, equipment manufacturers have designed facepiece-integrated microphones, intercom systems, throat mikes, and bone mikes worn in the ear or on the forehead.<sup>13,14</sup> The National Institute for Standards and Technology (NIST) has recently tested portable radios in simulated fire fighting environments and has identified that radios are vulnerable to exposures to elevated temperatures. Some degradation of radio performance was measured at elevated temperatures ranging from 100 to 260 degree C, with the radios returning to normal function after cooling down. Additional research is needed in this area.<sup>15</sup>

During this incident, the victim experienced intermittent radio communication problems and interruptions. Audio transcripts of the fireground channel recorded multiple instances where the victim inside the structure transmitted over the radio, but the transmissions were not heard or could not be understood. Effective radio communication is an important part of safe fireground operations.

***Recommendation #10: First responder radio manufacturers, research/design facilities and standard setting bodies should continue research and efforts to refine existing and develop new technology to track the movement of fire fighters inside structures.***

Discussion: Fire fighter fatalities often are the result of fire fighters becoming lost or disoriented on the fireground. The use of systems for locating lost or disoriented fire fighters could be instrumental in reducing the number of fire fighter deaths on the fireground. The National Institute for Standards and Technology (NIST) has been evaluating the feasibility of real-time fire fighter tracking and locator

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systems.<sup>12,16</sup> Research should continue into refining existing systems and developing new technologies for tracking the movement of fire fighters on the fireground.

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#### **INVESTIGATOR INFORMATION**

This incident was investigated by Matt Bowyer, General Engineer, and Tommy Baldwin, Safety and Occupational Health Specialist, with the NIOSH Fire Fighter Fatality Investigation and Prevention Program. Mr. Bowyer works in the Division of Safety Research and Mr. Baldwin works in the Division of Surveillance, Hazard Evaluations and Field Studies. An expert technical review was conducted by Division Chief Edward Buchanan, Hanover, Virginia Fire/EMS and President, International Society of Fire Service Instructors.

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Photo 3. Gas line to furnace. Part connecting top line (end near floor) and line into furnace is missing.  
(NIOSH photo)

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**Photo 4.** Collapsed section of floor the victims crawled across and the approximate location of their bodies in the basement.  
(NIOSH photo)

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Photo 5. Origin of the fire: small cedar closet used for growing orchids.  
(NIOSH photo)

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**Photo 6. Burned away floor joists above the small cedar closet along the C-side wall.**  
*(NIOSH photo)*

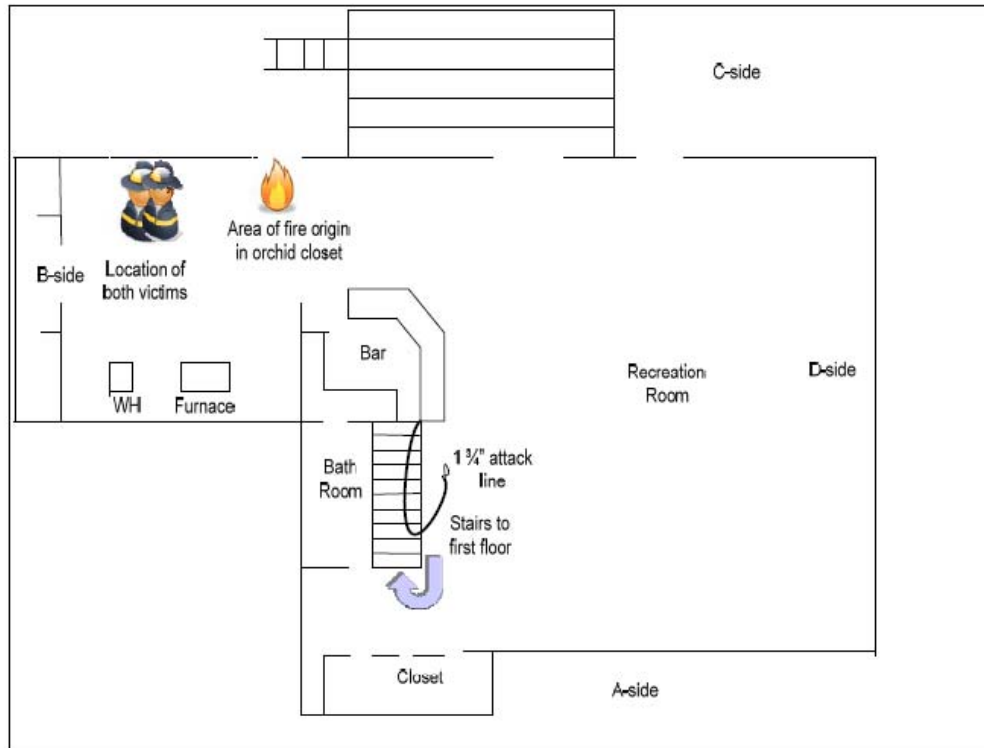
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**Diagram 1. Layout of the basement with approximate location where the victims were found and seat of the fire.**

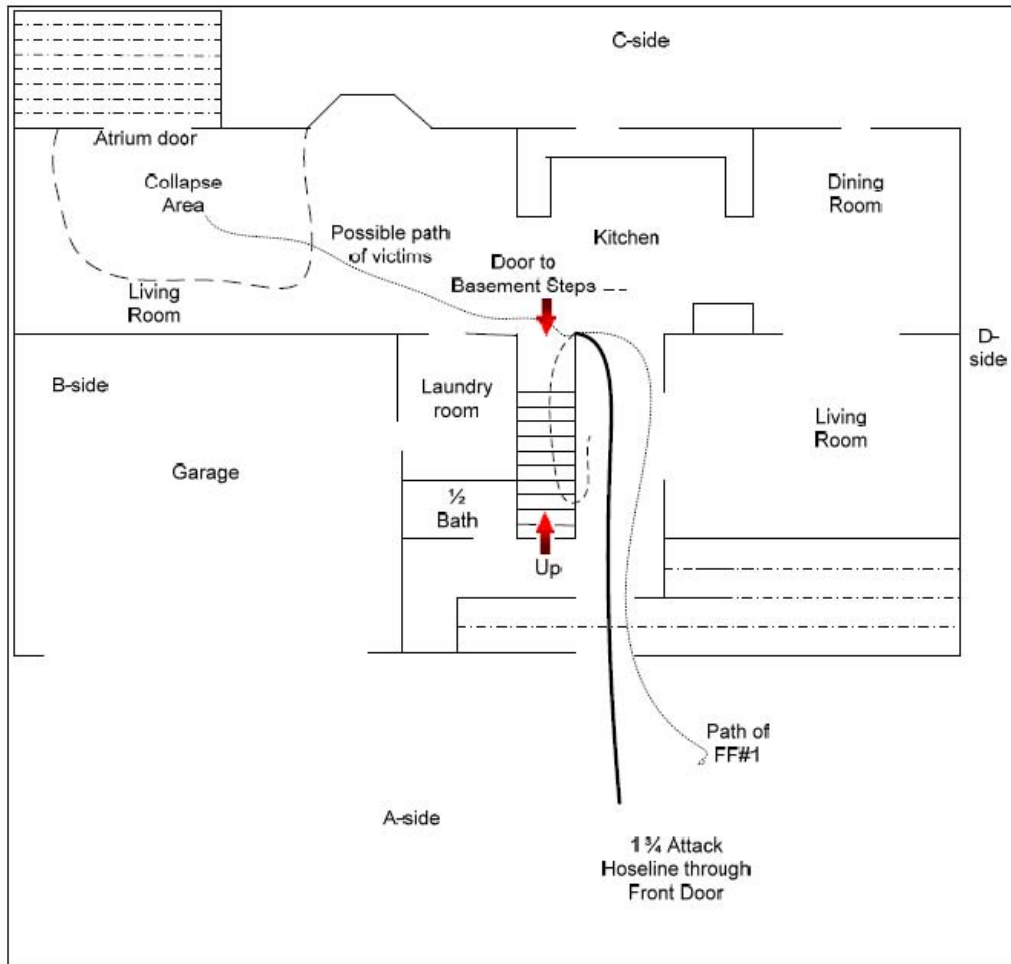
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**Diagram 2. Fire structure's first floor layout: Possible path of interior crew when the captain (Victim #1) told FF#1 to get out at basement stairs door.**

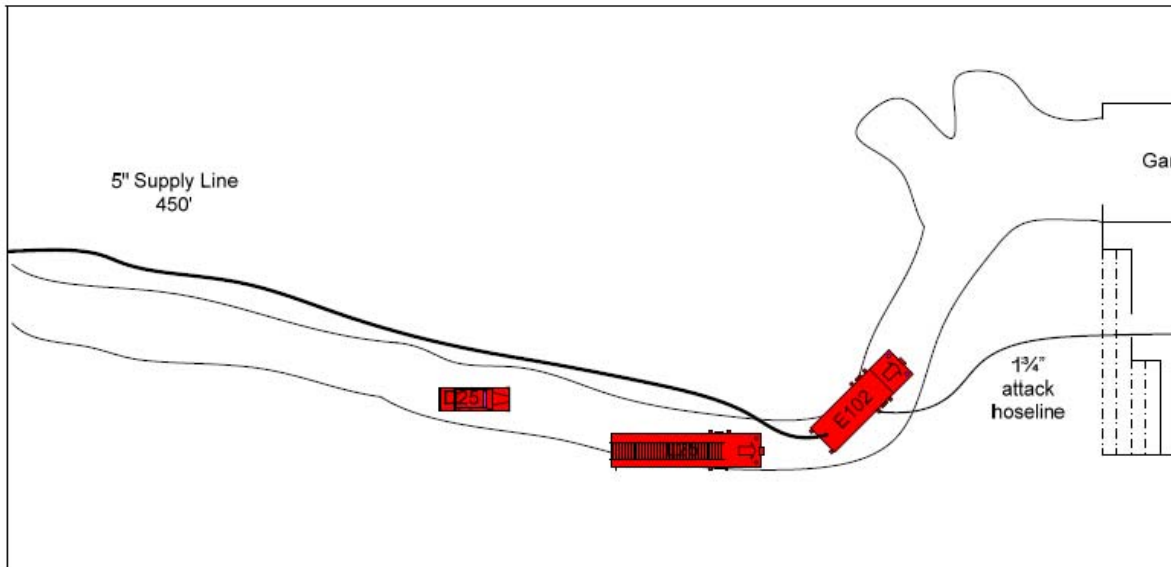
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**Diagram 3.** Location of key fire apparatus and 1 $\frac{3}{4}$ " attack hoseline from E102 into front door.

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# **APPENDIX C**

## **Radio Communications Log**



## APPENDIX C

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### Radio Data Log

The attached Radio Data Log (RDL) contains a brief snapshot of data and voice transmissions routed through the Hamilton County Communications Center (HCCC) during the Squirrelsnest Incident. The information contained in this data log can be confusing to interpret as it was intended more to provide technical data on the functioning and status of the communication system rather than to be used as a guide to follow voice transmissions. The following log is the result of combining the radio data with radio transcripts to obtain an approximation of how the communications system functioned during critical periods of the Squirrelsnest Incident.

The radio data log provides information from all public entities utilizing the HCCC system. In all, the radio data logs for the two-hour time period surrounding the Incident contained almost 18,000 lines of radio data and transmissions, therefore it was necessary to filter the log for information pertaining only to the Squirrelsnest Incident itself.

The Investigation Committee was unable to obtain a detailed glossary containing descriptions of the codes and messages presented. The resulting glossary and “users guide to reading the radio data log” has been compiled from countless interviews with HCCC personnel, radio transcripts and audio files from the Squirrelsnest Incident. It is presented in our own terms as we understand the codes and messages and how they relate to the events on April 4<sup>th</sup> 2008.

While every attempt has been made to provide accurate information concerning the radio transmissions surrounding this incident, it is also important to note that while operations were taking place on Squirrelsnest Lane, daily business continued to be conducted through the HCCC. Some data included in the following tables do represent possible radio transmissions occurring between HCCC and other fire department entities across Hamilton County in the performance of their duties on their own emergency calls. This information was filtered to the best of our abilities; however some of this routine data may have been included here.

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### *Radio Data Log Glossary*

#### *Column Headings*

<b>Time</b>	Time stamp issued by HCCC. Time consists of Date and Time in hours, minutes and seconds. {04/04/04 06:00:00}
<b>Message</b>	Activity of actions taken with radio. Example: Turning radio on/off sends data to computer and is thus marked with a data message stating that the radio is turned on and affiliated with a specific talkgroup.
<b>Unit ID</b>	<p>Radio identifier number. All radio units (portable, mobile and console) have a specific identifier. Public entity departments are given a specific range of identifiers based on station/department identifiers utilized by HCCC dispatch. The first number of identifier indicates entity type (2=fire department). Second set of numbers indicates department ID: (25=Colerain Twp.) Last three numbers indicate specific radio number.</p> <p>Ex. Radio Unit ID 225052 = Colerain Fire Radio #52 assigned to District Chief's vehicle.</p>
<b>TG Alias</b>	Talk Group is commonly called a "channel".
<b>Results / Status</b>	The result of the activity listed in the Message column.
<b>Radio Traffic</b>	Voice transmission as transcribed from audio files of the Squirrelsnest Incident.

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### *Specific Message Data*

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<b>PTT Button</b>	The Push To Talk (PTT) button. The PTT button is used to begin a voice transmission over the radio frequency. Commonly called "keying-up the mic". Subsequent transmissions are blocked until the PTT button is released. After the PTT button is released, there is a three second time-out phase which is part of the built-in scan feature. Additional radio transmissions are allowed during this three second time period.
<b>Mobility Update – Group Affiliation</b>	Occurs when a radio is turned on or changes Talk Groups.
<b>Call Activity Update – PTT-ID Update</b>	Indicates a new transmission has been activated using the PTT button during the three second time out phase of another radio transmission.
<b>Call Activity Update - Start of New Call</b>	The radio has begun a voice transmission by activating the PTT button.
<b>End of Call – ZC End of Call</b>	Indicates a transmission was allowed to be terminated without the three second time-out phase being interrupted by another radio transmission.
<b>Radio Status Traffic – Subscriber Reject</b>	The radio transmission has been rejected from transmitting due to the PTT button being depressed during another transmission on another radio. Voice transmission was not completed successfully.

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### *Specific Result/Status Data*

<b>Accepted</b>	Radio transmission of voice or data was accepted by HCCC services
<b>Reason for Busy = No Reason</b>	Radio transmission of voice or data was accepted by HCCC services. (This is an example of computer programming language to indicate that the call was received)
<b>#71, Individual not allowed to interrupt current audio source</b>	When a rejection occurs, data is sent to the HCCC why it was rejected. In this case, the radio transmission being rejected occurred after another radio was already transmitting voice across the system, and was therefore blocked from transmitting.
<b>#144, Stealth Reject</b>	This type of rejection occurs when two radios attempt to transmit at practically the same time. The HCCC computers determined which radio "captured the system first and blocks transmission of the other radio.

### *Row Color Coding*

<i>Color</i>	<i>Meaning</i>
	Critical Time Period from time of last contact with E102 Interior crew to identification of possible lost firefighters. Considered by the Investigation Committee to be the timing of Catastrophic Event that led to the firefighter fatalities.
<b>**Non Responding Unit</b>	Radio identified as not being assigned to the Squirrelsnest Incident. These radios have been identified as logging on to the system and in some instances also inadvertently transmitting on assigned fire ground channels. Radio ID numbers end with "XXX" so as not to point to specific individuals. However, individual departments may be identified to demonstrate how widespread this phenomenon became.
	Non Radio Traffic: Phone calls from ADT and Homeowner to HCCC.
	Critical information, benchmarks or other significant items as determined by the Investigation Committee.

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### *Users Guide to reading the Radio Data Logs*

	Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
1	[04/04/08 06:31:47]	Mobility Update - Group Affiliation	225095	FD WEST	Accepted	
2	[04/04/08 06:31:49]	Mobility Update - Group Affiliation	225095	FG 2	Accepted	
3	[04/04/08 06:31:58]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Are they close in proximity to you?
4	[04/04/08 06:32:01]	Call Activity Update - PTT-ID Update	225029	FG 2	Act/Busy Stat = Global Active	L25 OIC: No. I have not made entry into the -- or into the structure at this time.
5	[04/04/08 06:32:01]	Mobility Update - Group Affiliation	299XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
6	[04/04/08 06:32:06]	Radio Status Traffic - Subscriber Reject	225015	FG 2	#71, Individual not allowed to interrupt current audio source	
7	[04/04/08 06:32:08]	Radio Status Traffic - Subscriber Reject	225007	FG 2	Act/Busy Stat = Global Active	

The above excerpt from the Radio Data Log is intended for use to illustrate how the RDL should be viewed and interpreted. Line numbers have been added here for demonstration purposes only, as they are not present in the main copy of the RDL.

Line Number	Interpretation
1	At 06:31:47 radio number 225095 made a data connection on FD WEST to the HCCC as evidenced by the Mobility Update. The HCCC server accepted the transmission. There was no voice transmission with this entry.
2	At 06:31:39, radio number 225095 switched to FG 2 and connected with the HCCC. The HCCC Server accepted the transmission. There was no voice transmission with this entry.
3	At 06:31:58, Radio number 225088 (D-25) pressed the Push To Talk (PTT) button to transmit voice over FG2. "Are they in close proximity to you?"

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4	At 06:32:01, Radio number 225029 (L-25 OIC) pressed the Push To Talk (PTT) button to transmit voice over FG2. "No. I have not made entry into the -- or into the structure at this time.
5	At 06:32:01, Radio Number 299XXX, who was not assigned to the Squirrelsnest Incident as evidenced by ***NON-RESPONDING UNIT, made a data connection on FD WEST to the HCCC as evidenced by the Mobility Update. The HCCC server accepted the transmission. There was no voice transmission with this entry.
6	At 06:32:06, Radio number 225015 attempted to transmit a voice transmission on FG2. This attempt was rejected with the reason being: "#71, Individual not allowed to interrupt current audio source" This rejection occurred due to the previous radio transmission by L2 OIC listed above in Line #6.
7	At 06:32:08, Radio number 225088 attempted to transmit a voice transmission on FG2.
	These radio transmissions occurred during the Critical Event Time period as Considered by the Investigation Committee to be the timing of a Catastrophic Event that led to the firefighter fatalities.

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### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:11:23]	<b>NON RADIO TRAFFIC - PHONE CALL FROM ADT TO HCCC</b>		FD WEST		First notification to the HCCC from ADT Alarm Company reporting an automatic alarm activation from the main floor smoke detector and basement carbon monoxide detector for 5708 Squirrelsnest LN.
[04/04/08 06:11:29]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:11:33]	Mobility Update - Group Affiliation	256XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:11:52]	Mobility Update - Group Affiliation	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:13:02]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Attention Engine 102, Engine 109, Ladder 25, D-25, Fire Ground 2, respond to 5708 Squirrels Nest Lane for a fire alarm activation and a carbon monoxide alarm activation, the main floor smoke detector. Attention Engine 103, Engine 109, Ladder 25, D-25, Fire Ground 2, respond to 5708 Squirrelsnest Lane for a fire alarm activation, a carbon monoxide alarm activation. Fire alarm on the main floor smoke detector. Cross street is Dunlap. At 6:13.
[04/04/08 06:13:06]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:13:36]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:13:43]	<b>NON RADIO TRAFFIC - PHONE CALL #1 FROM HOMEOWNER</b>		FD WEST		HOMEOWNER - "It's in the basement"
[04/04/08 06:13:44]	Mobility Update - Group Affiliation	225088	FG 2	Accepted	
[04/04/08 06:14:05]	Mobility Update - Group Affiliation	225076	FD WEST	Accepted	
[04/04/08 06:14:06]	Call Activity Update - Start of New Call	Broxterman	FD WEST	Accepted	Capt. Broxterman - "Engine 102 en route"
[04/04/08 06:14:10]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Engine 102 en route, 5708 Squirrels Nest Lane, at 6:14. This is also a long-lay location. Refer to map Page 169, 169
[04/04/08 06:14:10]	Mobility Update - Group Affiliation	225016	FG 2	Accepted	
[04/04/08 06:14:33]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:14:34]	Mobility Update - Group Affiliation	225104	FD WEST	Accepted	
[04/04/08 06:14:35]	Call Activity Update - Start of New Call	225016	FG 2	Reason = Disconnect complete	
[04/04/08 06:14:41]	Mobility Update - Group Affiliation	225050	FD WEST	Accepted	
[04/04/08 06:14:44]	Mobility Update - Group Affiliation	278XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:14:45]	Mobility Update - Group Affiliation	225076	FD WEST	Accepted	
[04/04/08 06:14:53]	Mobility Update - Group Affiliation	225017	FD WEST	Accepted	
[04/04/08 06:14:55]	Call Activity Update - Start of New Call	225017	FD WEST	Accepted	
[04/04/08 06:14:58]	Mobility Update - Group Affiliation	Schira	FG 2	Accepted	
[04/04/08 06:15:12]	Mobility Update - Group Affiliation	256XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:15:18]	Mobility Update - Group Affiliation	225007	FG 2	Accepted	
[04/04/08 06:15:22]	Mobility Update - Group Affiliation	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:15:26]	Mobility Update - Group Affiliation	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:15:28]	Mobility Update - Group Affiliation	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:15:40]	Mobility Update - Group Affiliation	242006	FD WEST	Accepted	
[04/04/08 06:15:44]	Mobility Update - Group Affiliation	225052	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:15:44]	Call Activity Update - Start of New Call	225104	FD WEST	Accepted	

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### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:15:45]	Call Activity Update - PTT-ID Update	225104	FD WEST	Accepted	ENGINE 109: Engine 109 is en route.
[04/04/08 06:15:51]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Engine 109 en route, 5708 Squirrels Nest Lane, at 6:15. This is a long-lay location. Refer to map Page 169.
[04/04/08 06:16:02]	Mobility Update - Group Affiliation	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:16:06]	Call Activity Update - Start of New Call	225050	FD WEST	Act/Busy Stat = Global Active	LADDER 25: Ladder 25 en route.
[04/04/08 06:16:09]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Ladder 25 also en route, 6:16.
[04/04/08 06:16:11]	Mobility Update - Group Affiliation	242002	FD WEST	Accepted	
[04/04/08 06:16:17]	Mobility Update - Group Affiliation	278XXX	FG 2	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 06:16:27]	Call Activity Update - Start of New Call	225052	FD WEST	Reason for Busy = No Reason	D-25: D-25 responding.
[04/04/08 06:16:28]	Mobility Update - Group Affiliation	225088	FG 2	Accepted	
[04/04/08 06:16:30]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: D-25 en route, 5708 Squirrels Nest Lane, 6:16.
[04/04/08 06:16:44]	Mobility Update - Group Affiliation	242006	FD WEST	Accepted	
[04/04/08 06:16:52]	Mobility Update - Group Affiliation	225084	FG 2	Accepted	
[04/04/08 06:17:07]	Mobility Update - Group Affiliation	225029	FD WEST	Accepted	
[04/04/08 06:17:11]	Mobility Update - Group Affiliation	225029	FG 2	Deregistered by ISP	
[04/04/08 06:17:16]	Mobility Update - Group Affiliation	225091	FG 2	Accepted	
[04/04/08 06:17:20]	Mobility Update - Group Affiliation	225029	FG 2	Accepted	
[04/04/08 06:17:35]	Call Activity Update - Start of New Call	225029	FG 2	Reason for Busy = No Reason	L25 OIC: Ladder 25 on Channel 2.
[04/04/08 06:17:48]	Call Activity Update - Start of New Call	225018	FG 2	Reason = Disconnect complete	
[04/04/08 06:17:55]	Mobility Update - Group Affiliation	225018	FG 2	Accepted	
[04/04/08 06:18:01]	Mobility Update - Group Affiliation	225088	FG 2	Accepted	
[04/04/08 06:18:06]	Call Activity Update - Start of New Call	225084	FG 2	Reason for Busy = No Reason	E109 OIC: Engine 102 from Engine 109 on 2.
[04/04/08 06:18:12]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:18:49]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:18:50]	Call Activity Update - Start of New Call	225084	FG 2	Reason for Busy = No Reason	E109 OIC: Engine 102 from Engine 109 on 2.
[04/04/08 06:18:56]	Mobility Update - Group Affiliation	256XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:19:25]	Call Activity Update - Start of New Call	225084	FG 2	Reason = Disconnect complete	
[04/04/08 06:19:53]	Mobility Update - Group Affiliation	225017	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:20:35]	Mobility Update - Group Affiliation	225025	FD WEST	Accepted	
[04/04/08 06:20:35]	Mobility Update - Group Affiliation	Broxterman	FG 2	Accepted	
[04/04/08 06:20:36]	Call Activity Update - Start of New Call	Broxterman	FG 2	Reason = Disconnect complete	CAPTAIN BROXTERMAN: Engine 109, we copy, [inaudible].
[04/04/08 06:20:43]	NON RADIO TRAFFIC - PHONE CALL #2 FROM HOMEOWNER		FD WEST		Homeowner re-stating working fire in the basement. This call routed through City of Cincinnati Dispatch
[04/04/08 06:20:57]	Mobility Update - Group Affiliation	242016	FD WEST	Accepted	
[04/04/08 06:21:00]	Mobility Update - Group Affiliation	Schira	FG 2	Accepted	
[04/04/08 06:21:46]	Mobility Update - Group Affiliation	407807	FD WEST	Accepted	

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:22:02]	Call Activity Update - Start of New Call	4002	FD WEST	Reason for Busy = No Reason	HCCC: Attention Engine 102, Engine 109, Ladder 25, D-25, the resident called from 5708 Squirrelsnest Lane advising there's a working structure fire. They're evacuating. Repeating, reference 5708 Squirrels Nest Lane, resident called advising it is a working structure fire. They are evacuating the residence.
[04/04/08 06:22:34]	Call Activity Update - Start of New Call	225104	FD WEST	Accepted	ENGINE 109: Engine 109 is clear on the working structure fire. Can you redispach that?
[04/04/08 06:22:36]	Mobility Update - Group Affiliation	225102	FD WEST	Accepted	
[04/04/08 06:22:37]	Mobility Update - Group Affiliation	225086	FD WEST	Accepted	
[04/04/08 06:22:41]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Affirmative. Attention Engine 25, Rescue 26, Squad 25, respond 5708 Squirrelsnest Lane for a fire alarm that is now a working structure fire. They're evacuating the residence. Utilize Fire Ground 2. Attention Engine 25, Rescue 26, Squad 25, respond 5708 Squirrelsnest Lane for a now confirmed structure fire. Evacuating the residence. Cross street is Dunlap Road. Utilize Fire Ground 2. This is also a long-lay residence. Refer to map Page 169. At 6:23.
[04/04/08 06:22:42]	Mobility Update - Group Affiliation	225086	FG 2	Accepted	
[04/04/08 06:22:44]	Mobility Update - Group Affiliation	225102	FD WEST	Accepted	
[04/04/08 06:22:47]	Call Activity Update - Start of New Call	225084	FG 2	Reason for Busy = No Reason	E109 OIC:: 102, did you copy the working fire?
[04/04/08 06:22:53]	Call Activity Update - PTT-ID Update	Broxterman	FG 2	Reason = Disconnect complete	CAPTAIN BROXTERMAN: Clear.
[04/04/08 06:22:58]	Call Activity Update - Start of New Call	4002	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:23:00]	Mobility Update - Group Affiliation	283XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:23:01]	Mobility Update - Group Affiliation	247XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:23:05]	Mobility Update - Group Affiliation	278XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:23:14]	Mobility Update - Group Affiliation	225043	FD WEST	Accepted	
[04/04/08 06:23:18]	Mobility Update - Group Affiliation	225102	FG 2	Accepted	
[04/04/08 06:23:19]	Mobility Update - Group Affiliation	264XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:23:20]	Mobility Update - Group Affiliation	225032	FD WEST	Accepted	
[04/04/08 06:23:20]	Mobility Update - Group Affiliation	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:23:25]	Mobility Update - Group Affiliation	225032	FG 2	Accepted	
[04/04/08 06:23:25]	Mobility Update - Group Affiliation	286XXX	FG 2	Deregistered by ISP	***NON-RESPONDING UNIT
[04/04/08 06:23:26]	Mobility Update - Group Affiliation	286XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:23:28]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:23:33]	Mobility Update - Group Affiliation	225088	FG 2	Accepted	
[04/04/08 06:23:34]	Mobility Update - Group Affiliation	206XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:23:35]	Mobility Update - Group Affiliation	278XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:23:44]	Mobility Update - Group Affiliation	225101	FG 2	Accepted	
[04/04/08 06:23:50]	Call Activity Update - Start of New Call	225084	FG 2	Accepted	E109 OIC:: Engine 109, all companies, Engine 102 has street laid at the driveway. 109 has made the connection, connection at 5712.
[04/04/08 06:23:56]	Mobility Update - Group Affiliation	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:23:59]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:24:00]	Mobility Update - Group Affiliation	240XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:24:01]	Call Activity Update - Start of New Call	Broxterman	FD WEST	Accepted	CAPTAIN BROXTERMAN: Engine 102 on the scene. Moderate smoke showing. Engine 102 will be Squirrelsnest command.
[04/04/08 06:24:02]	Mobility Update - Group Affiliation	225053	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:24:02]	Mobility Update - Group Affiliation	227014	FG 2	Reason = Disconnect complete	***NON-RESPONDING UNIT
[04/04/08 06:24:09]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Engine 102 on scene, advising smoke showing. Engine 102 will be command. 6:24.
[04/04/08 06:24:16]	Mobility Update - Group Affiliation	225015	FG 2	Accepted	
[04/04/08 06:24:19]	Mobility Update - Group Affiliation	225021	FG 2	Accepted	
[04/04/08 06:24:20]	Mobility Update - Group Affiliation	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:24:23]	Mobility Update - Group Affiliation	225021	FD WEST	Accepted	
[04/04/08 06:24:28]	Mobility Update - Group Affiliation	225021	FG 2	Accepted	
[04/04/08 06:24:30]	Call Activity Update - Start of New Call	225053	FD WEST	Accepted	ENGINE 25: Engine 25 in service.
[04/04/08 06:24:35]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Engine 25 en route, 5708 Squirrelsnest Lane, 6:24. Utilize Fire Ground 2.
[04/04/08 06:24:42]	Call Activity Update - PTT-ID Update	225043	FD WEST	Reason for Busy = No Reason	RESCUE 26: Rescue 26, likewise.
[04/04/08 06:24:43]	Radio Status Traffic - Subscriber Reject	225104	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:24:45]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Rescue 26 also responding. Utilize Fire Ground 2. Repeating, this is a long-lay residence. Utilize map Page 169.
[04/04/08 06:24:45]	Mobility Update - Group Affiliation	225042	FD WEST	Accepted	
[04/04/08 06:24:48]	Mobility Update - Group Affiliation	225082	FG 2	Accepted	
[04/04/08 06:24:48]	Mobility Update - Group Affiliation	247XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:24:52]	Mobility Update - Group Affiliation	225018	FG 2	Accepted	
[04/04/08 06:24:54]	Mobility Update - Group Affiliation	407807	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:24:55]	Call Activity Update - PTT-ID Update	225104	FD WEST	Accepted	ENGINE 109: Engine 109 is on scene.
[04/04/08 06:24:59]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Engine 109 on scene at 6:24.
[04/04/08 06:25:00]	Mobility Update - Group Affiliation	225105	FD WEST	Accepted	
[04/04/08 06:25:03]	Call Activity Update - Start of New Call	225018	FG 2	Reason = Disconnect complete	E25 OIC: Engine 25 en route on 2.
[04/04/08 06:25:11]	Mobility Update - Group Affiliation	225039	FD WEST	Accepted	
[04/04/08 06:25:15]	Call Activity Update - Start of New Call	4002	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:25:15]	Mobility Update - Group Affiliation	225039	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:25:23]	Mobility Update - Group Affiliation	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:25:30]	Mobility Update - Group Affiliation	256XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:25:35]	Mobility Update - Group Affiliation	225043	FG 2	Accepted	
[04/04/08 06:25:35]	Call Activity Update - PTT-ID Update	225050	FD WEST	Accepted	LADDER 25: Ladder 25 on scene.
[04/04/08 06:25:36]	Radio Status Traffic - Subscriber Reject	225105	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:25:38]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Ladder 25 on scene, 6:25.
[04/04/08 06:25:39]	Mobility Update - Group Affiliation	225023	FD WEST	Reason for Busy = No Reason	

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:25:39]	Call Activity Update - Start of New Call	225043	FG 2	Accepted	R26 OIC: Rescue's en route on 2.
[04/04/08 06:25:40]	Mobility Update - Group Affiliation	225037	FG 2	Reason = Disconnect complete	
[04/04/08 06:25:44]	Call Activity Update - Start of New Call	225105	FD WEST	Accepted	SQUAD 25: Squad 25 en route with fire company.
[04/04/08 06:25:47]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Squad 25 en route, 5708 Squirrelsnest Lane, 6:25. Utilize Fire Ground 2.
[04/04/08 06:25:50]	Mobility Update - Group Affiliation	225038	FG 2	Accepted	
[04/04/08 06:26:00]	Call Activity Update - Start of New Call	4002	FD WEST	Reason for Busy = No Reason	HCCC: Attention for all units, 5708 Squirrelsnest Lane, received an additional call stating that the fire was in the basement of the residence, stating fire is reported to be in the basement of the residence of Squirrelsnest Lane.
[04/04/08 06:26:08]	Mobility Update - Group Affiliation	225039	FD WEST	Accepted	
[04/04/08 06:26:09]	Mobility Update - Group Affiliation	253XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:26:21]	Call Activity Update - Start of New Call	225018	FG 2	Reason for Busy = No Reason	E25 OIC: Engine 25 for D-25, confirming that it's a long lay.
[04/04/08 06:26:21]	Call Activity Update - Start of New Call	253XXX	FD WEST	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 06:26:24]	Mobility Update - Group Affiliation	225037	FG 2	Accepted	
[04/04/08 06:26:26]	Mobility Update - Group Affiliation	225039	FG 2	Accepted	
[04/04/08 06:26:28]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: It's a short one, truck.
[04/04/08 06:26:29]	Call Activity Update - Start of New Call	4002	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:26:32]	Call Activity Update - PTT-ID Update	225018	FG 2	Accepted	E25 OIC: You're clear.
[04/04/08 06:26:32]	Mobility Update - Group Affiliation	239XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:26:35]	Call Activity Update - PTT-ID Update	225052	FD WEST	Act/Busy Stat = Global Active	D-25: D-25 on the scene, assuming command.
[04/04/08 06:26:35]	Mobility Update - Group Affiliation	225085	FG 2	Accepted	
[04/04/08 06:26:38]	Call Activity Update - Start of New Call	225037	FG 2	Reason = Disconnect complete	SQ25: Squad 25 on 2.
[04/04/08 06:26:39]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: D-25 on scene, assuming command, 6:26.
[04/04/08 06:26:45]	Mobility Update - Group Affiliation	225022	FG 2	Accepted	
[04/04/08 06:26:45]	Call Activity Update - Start of New Call	225088	FG 2	Reason for Busy = No Reason	D-25: Command to Engine 102, do we have a confirmed working fire?
[04/04/08 06:26:56]	Call Activity Update - Start of New Call	Broxterman	FG 2	Reason for Busy = No Reason	CAPTAIN BROXTERMAN: Engine 102 is advancing into the structure at this time. Stand by.
[04/04/08 06:27:03]	Mobility Update - Group Affiliation	292XXX	FG 2	Reason = Disconnect complete	***NON-RESPONDING UNIT
[04/04/08 06:27:03]	Call Activity Update - PTT-ID Update	Broxterman	FG 2	Accepted	CAPTAIN BROXTERMAN: "[E102 FAO], we need water. "
[04/04/08 06:27:08]	Call Activity Update - Start of New Call	225052	FD WEST	Act/Busy Stat = Global Active	D-25: Squirrelsnest Command. If you could, dispatch this as a staff notification, please.
[04/04/08 06:27:10]	Call Activity Update - Start of New Call	Broxterman	FG 2	Reason for Busy = No Reason	
[04/04/08 06:27:12]	Call Activity Update - PTT-ID Update	225029	FG 2	Reason = Disconnect complete	L25 OIC: Ladder 25, that is [inaudible]. We do have a working fire.
[04/04/08 06:27:17]	Call Activity Update - Start of New Call	4002	FD WEST	Reason for Busy = No Reason	HCCC: That's clear.
[04/04/08 06:27:26]	Mobility Update - Group Affiliation	225030	FG 2	Accepted	
[04/04/08 06:27:26]	Call Activity Update - Start of New Call	225088	FG 2	Reason for Busy = No Reason	D-25: Engine 109, OIC from command.
[04/04/08 06:27:31]	Call Activity Update - PTT-ID Update	225084	FG 2	Act/Busy Stat = Global Active	E109 OIC: Go ahead.
[04/04/08 06:27:35]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Stand by.
[04/04/08 06:27:41]	Call Activity Update - Start of New Call	225007	FG 2	Reason = Disconnect complete	Car 2508: Car 8 is on the scene.
[04/04/08 06:27:52]	Call Activity Update - Start of New Call	Broxterman	FG 2	Accepted	CAPTAIN BROXTERMAN: Engine 102 making entry in the basement, heavy smoke.
[04/04/08 06:27:57]	Mobility Update - Group Affiliation	225066	FD WEST	Accepted	
[04/04/08 06:28:00]	Call Activity Update - Start of New Call	225088	FG 2	Reason for Busy = No Reason	D-25: Interior, I'm getting a lot of feedback from you.

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:28:04]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:28:13]	Call Activity Update - Start of New Call	225029	FG 2	Deregistered by ISP	L25 OIC: Ladder 25, be advised Engine 102 is making entry into the basement.
[04/04/08 06:28:20]	Call Activity Update - PTT-ID Update	225088	FG 2	Accepted	D-25: Okay. I'm a little bit away from the building. Can you give me the conditions as you have them now?
[04/04/08 06:28:23]	Mobility Update - Group Affiliation	206XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:28:26]	Call Activity Update - PTT-ID Update	225029	FG 2	Act/Busy Stat = Global Active	L25 OIC: We have heavy smoke. You can definitely tell that it's in the, in the structure itself. It is a basement fire.
[04/04/08 06:28:26]	Mobility Update - Group Affiliation	225033	FG 2	Accepted	
[04/04/08 06:28:31]	Call Activity Update - PTT-ID Update	225029	FG 2	Accepted	
[04/04/08 06:28:32]	Mobility Update - Group Affiliation	225001	FG 2	Deregistered by ISP	
[04/04/08 06:28:40]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Okay. I'm assigning you to Interior 1. Actually, correction, you'll be searching. Ladder 25, you'll be searching.
[04/04/08 06:28:40]	Radio Status Traffic - Subscriber Reject	Broxterman	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:28:42]	Mobility Update - Group Affiliation	256XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:28:49]	Call Activity Update - PTT-ID Update	225029	FG 2	Reason = Disconnect complete	L25 OIC: Clear on search.
[04/04/08 06:28:53]	Mobility Update - Group Affiliation	225096	FG 2	Accepted	
[04/04/08 06:28:54]	Mobility Update - Group Affiliation	225036	FG 2	Accepted	
[04/04/08 06:28:55]	Call Activity Update - Start of New Call	225088	FG 2	Reason for Busy = No Reason	D-25: Engine 25 from Command, you're -- you will be assigned accountability. Bring your crew forward with your tools.
[04/04/08 06:28:55]	Radio Status Traffic - Subscriber Reject	Broxterman	FG 2	Accepted	
[04/04/08 06:28:57]	Mobility Update - Group Affiliation	225030	FG 2	Accepted	
[04/04/08 06:29:02]	Radio Status Traffic - Subscriber Reject	225029	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:29:05]	Call Activity Update - PTT-ID Update	225029	FG 2	Act/Busy Stat = Global Active	L25 OIC: Engine 102, they need some water.
[04/04/08 06:29:06]	Radio Status Traffic - Subscriber Reject	225018	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:29:06]	Radio Status Traffic - Subscriber Reject	Broxterman	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:29:07]	Radio Status Traffic - Subscriber Reject	Broxterman	FG 2	Accepted	
[04/04/08 06:29:10]	Mobility Update - Group Affiliation	225020	FD WEST	Accepted	
[04/04/08 06:29:11]	Call Activity Update - Start of New Call	4002	FD WEST	Reason for Busy = No Reason	HCCC: Announcing staff notification for Colerain Township Fire. Repeating, staff notification, Colerain Township Fire, 5708 Squirrelsnest Lane, Fire Ground 2, at 6:29.
[04/04/08 06:29:12]	Call Activity Update - Start of New Call	225018	FG 2	Accepted	E25 OIC: Engine 25's clear on accountability, bringing forward tools.
[04/04/08 06:29:14]	Mobility Update - Group Affiliation	225511	FD WEST	Accepted	
[04/04/08 06:29:15]	Mobility Update - Group Affiliation	225020	FG 2	Accepted	
[04/04/08 06:29:19]	Call Activity Update - PTT-ID Update	225088	FG 2	Deregistered by ISP	D-25: Engine 102 FAO, you clear on water?
[04/04/08 06:29:20]	Radio Status Traffic - Subscriber Reject	225016	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:29:24]	Call Activity Update - PTT-ID Update	225016	FG 2	Act/Busy Stat = Global Active	E102 FF#2: 102, we need water.
[04/04/08 06:29:25]	Radio Status Traffic - Subscriber Reject	225015	FG 2	Reason = Disconnect complete	
[04/04/08 06:29:30]	Call Activity Update - Start of New Call	225015	FG 2	Reason for Busy = No Reason	E102 FAO: Yeah, Attack Line 1'S water, getting it now. Hydrant, I'm ready for water. This is Engine 102
[04/04/08 06:29:30]	Mobility Update - Group Affiliation	225100	FD WEST	Accepted	
[04/04/08 06:29:41]	Call Activity Update - Start of New Call	225085	FG 2	Reason for Busy = No Reason	E109 FAO: Engine 102 FAO from Engine 109 FAO, water will be on the way momentarily.
[04/04/08 06:29:47]	Mobility Update - Group Affiliation	225100	FG 2	Accepted	
[04/04/08 06:29:48]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Engine 102 FAO, are you holding up interior water because of the hydrant water?

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### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:29:56]	Call Activity Update - PTT-ID Update	225015	FG 2	Act/Busy Stat = Global Active	E102 FAO: No, sir. I didn't hear them call.
[04/04/08 06:30:01]	Call Activity Update - PTT-ID Update	225088	FG 2	Accepted	D-25: Okay, that's clear.
[04/04/08 06:30:03]	Mobility Update - Group Affiliation	248XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:30:07]	Call Activity Update - Start of New Call	225085	FG 2	Reason for Busy = No Reason	E109 FAO: Engine 102 FAO, you ready for water?
[04/04/08 06:30:11]	Call Activity Update - PTT-ID Update	225015	FG 2	Act/Busy Stat = Global Active	E102 FAO: Engine 102 is ready for water.
[04/04/08 06:30:16]	Call Activity Update - PTT-ID Update	225085	FG 2	Act/Busy Stat = Global Active	E109 FAO: Here it comes.
[04/04/08 06:30:17]	Call Activity Update - Start of New Call	253XXX	FD WEST	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 06:30:21]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:30:30]	Mobility Update - Location Registration	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:30:34]	Mobility Update - Location Registration	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:30:35]	Call Activity Update - Start of New Call	225084	FG 2	Reason for Busy = No Reason	E109 OIC:: Command from Engine 109, contact 102, have them pull out of this first floor, redeploy to the back. It's easy access. Conditions are changing at the front door.
[04/04/08 06:30:39]	Radio Status Traffic - Subscriber Reject	225016	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:30:55]	Call Activity Update - PTT-ID Update	225088	FG 2	Reason for Busy = No Reason	D-25: Interior from Command, did you copy?
[04/04/08 06:30:58]	Call Activity Update - Start of New Call	225053	FD WEST	Act/Busy Stat = Global Active	ENGINE 25: Engine 25, we're on the scene.
[04/04/08 06:31:02]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Engine 25 on-scene at 6:31.
[04/04/08 06:31:05]	Mobility Update - Location Registration	225043	FG 2	Accepted	
[04/04/08 06:31:12]	Call Activity Update - Start of New Call	225088	FG 2	Accepted	D-25: Interior from Command.
[04/04/08 06:31:19]	Mobility Update - Group Affiliation	253XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:31:21]	Call Activity Update - Start of New Call	225029	FG 2	Reason for Busy = No Reason	L25 OIC: Ladder 25 Search, could you have Exterior Ladder 25 get the positive pressure going ASAP?
[04/04/08 06:31:27]	Mobility Update - Group Affiliation	253XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:31:31]	Mobility Update - Group Affiliation	225019	FG 2	Accepted	
[04/04/08 06:31:36]	Call Activity Update - Start of New Call	225088	FG 2	Reason = Disconnect complete	D-25: How many person crew did you have?
[04/04/08 06:31:41]	Call Activity Update - PTT-ID Update	225029	FG 2	Accepted	L25 OIC: We had a four-person crew. We need somebody to get the positive pressure going as soon as possible. I don't know if Engine 102 has heard they're redeployed to the rear of the structure.
[04/04/08 06:31:47]	Mobility Update - Group Affiliation	225095	FD WEST	Accepted	
[04/04/08 06:31:49]	Mobility Update - Group Affiliation	225095	FG 2	Accepted	
[04/04/08 06:31:58]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Are they close in proximity to you?
[04/04/08 06:32:01]	Call Activity Update - PTT-ID Update	225029	FG 2	Act/Busy Stat = Global Active	L25 OIC: No. I have not made entry into the -- or into the structure at this time.
[04/04/08 06:32:01]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:32:06]	Radio Status Traffic - Subscriber Reject	225015	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:32:08]	Radio Status Traffic - Subscriber Reject	225007	FG 2	Act/Busy Stat = Global Active	
[04/04/08 06:32:08]	Call Activity Update - PTT-ID Update	225088	FG 2	#144, Stealth Reject	D-25: Okay. We're working on positive pressure. Interior 1 from Command.
[04/04/08 06:32:15]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:32:17]	Mobility Update - Group Affiliation	278XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:32:19]	Call Activity Update - Start of New Call	225007	FG 2	Reason for Busy = No Reason	Car 2508: Rear to Command, it's out a window and a rear patio door on the first floor. It's lapping up to the second floor. They need to get water on it quick.
[04/04/08 06:32:21]	Radio Status Traffic - Subscriber Reject	225029	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:32:22]	Radio Status Traffic - Subscriber Reject	225029	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:32:23]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:32:29]	Radio Status Traffic - Subscriber Reject	225029	FG 2	#144, Stealth Reject	
[04/04/08 06:32:29]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Okay, that's clear. Do we have a second line around the rear?
[04/04/08 06:32:31]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:32:34]	Call Activity Update - PTT-ID Update	225007	FG 2	Act/Busy Stat = Global Active	Car 2508: We have a line back here. They may be able to knock down some of the exterior fire so it doesn't autocommunicate up to the second floor.
[04/04/08 06:32:34]	Radio Status Traffic - Subscriber Reject	225029	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:32:36]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:32:40]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Okay. Engine 25 from Command, when your personnel come forward, send them to the rear sector.
[04/04/08 06:32:41]	Radio Status Traffic - Subscriber Reject	225029	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:32:43]	Radio Status Traffic - Subscriber Reject	225029	FG 2	Reason for Busy = No Reason	
[04/04/08 06:32:44]	Call Activity Update - Start of New Call	225023	FD WEST	#71, Individual not allowed to interrupt current audio source	R26: Rescue 26 on the scene.
[04/04/08 06:32:47]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Rescue 26 on scene at 6:32. Also, Duke has been notified. No ETA.
[04/04/08 06:32:48]	Call Activity Update - PTT-ID Update	225018	FG 2	Act/Busy Stat = Global Active	E25 OIC: 25 clear. We're coming down the driveway. Anything else you needed in the rear sector?
[04/04/08 06:32:54]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Not at this time. Interior 1 from Command, someone from the interior respond.
[04/04/08 06:32:55]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:33:02]	Call Activity Update - Start of New Call	225029	FG 2	Reason for Busy = No Reason	L25 OIC: Rear, we need the charged line. It's charged.
[04/04/08 06:33:04]	Radio Status Traffic - Subscriber Reject	225038	FG 2	Accepted	
[04/04/08 06:33:06]	Mobility Update - Group Affiliation	225069	FD WEST	Accepted	
[04/04/08 06:33:09]	Call Activity Update - PTT-ID Update	225088	FG 2	Accepted	D-25: Engine 102, charge the rear line. Rear from Command.
[04/04/08 06:33:12]	Mobility Update - Group Affiliation	225008	FG 2	Accepted	
[04/04/08 06:33:16]	Call Activity Update - PTT-ID Update	225038	FG 2	Accepted	R26: Rescue 26 on scene.
[04/04/08 06:33:17]	Mobility Update - Group Affiliation	Schira	FG 2	Accepted	
[04/04/08 06:33:21]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Rescue 26, bring your personnel forward and pair up with Engine 25's
[04/04/08 06:33:23]	Radio Status Traffic - Subscriber Reject	Schira	FG 2	Deregistered by ISP	
[04/04/08 06:33:28]	Mobility Update - Group Affiliation	253XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:33:29]	Radio Status Traffic - Subscriber Reject	225088	FG 2	Accepted	
[04/04/08 06:33:29]	Call Activity Update - Start of New Call	Schira	FG 2	Reason for Busy = No Reason	FIREFIGHTER SCHIRA'S RADIO: [Open microphone].
[04/04/08 06:33:33]	Mobility Update - Group Affiliation	225030	FG 2	Accepted	
[04/04/08 06:33:37]	Call Activity Update - Start of New Call	Schira	FG 2	Reason for Busy = No Reason	FIREFIGHTER SCHIRA'S RADIO: [Inaudible].
[04/04/08 06:33:41]	Call Activity Update - PTT-ID Update	278XXX	FG 2	Act/Busy Stat = Global Active	***NON-RESPONDING UNIT
[04/04/08 06:33:42]	Call Activity Update - PTT-ID Update	278XXX	FG 2	#144, Stealth Reject	***NON-RESPONDING UNIT
[04/04/08 06:33:42]	Radio Status Traffic - Subscriber Reject	Schira	FG 2	Act/Busy Stat = Global Active	
[04/04/08 06:33:44]	Radio Status Traffic - Subscriber Reject	225007	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:33:44]	Radio Status Traffic - Subscriber Reject	Schira	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:33:46]	Call Activity Update - PTT-ID Update	225088	FG 2	Deregistered by ISP	D-25: Unit calling, repeat.
[04/04/08 06:33:47]	Mobility Update - Group Affiliation	225513	FD WEST	Accepted	
[04/04/08 06:33:48]	Radio Status Traffic - Subscriber Reject	225007	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:33:52]	Call Activity Update - Start of New Call	225007	FG 2	Reason for Busy = No Reason	Car 2508: Rear to Command, exterior fire is knocked down. However, it may be up in the attic. We've still got fire out two windows here in the back.
[04/04/08 06:33:59]	Call Activity Update - PTT-ID Update	225088	FG 2	Deregistered by ISP	D-25: Okay, I've got personnel coming. Have you seen Interior 1?

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:34:06]	Call Activity Update - PTT-ID Update	225007	FG 2	Act/Busy Stat = Global Active	Car 2508: Negative. I've got 109's back here with me.
[04/04/08 06:34:10]	Call Activity Update - PTT-ID Update	225088	FG 2	Accepted	D-25: That's clear. Engine 25, your crew is going to be RAT. Get set up. I have not heard from Interior 1. Try to see, rear, if we can acknowledge or get some confirmation from Interior 1.
[04/04/08 06:34:13]	Mobility Update - Group Affiliation	225504	FD WEST	Accepted	
[04/04/08 06:34:20]	Mobility Update - Group Affiliation	225079	FG 2	Accepted	
[04/04/08 06:34:23]	Mobility Update - Group Affiliation	240XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:34:25]	Call Activity Update - PTT-ID Update	225096	FG 2	Act/Busy Stat = Global Active	E26 OIC: Command from Engine 26.
[04/04/08 06:34:29]	Call Activity Update - PTT-ID Update	225088	FG 2	Accepted	D-25: Engine 26, go ahead.
[04/04/08 06:34:29]	Mobility Update - Group Affiliation	240XXX	FG 11	Act/Busy Stat = Global Active	***NON-RESPONDING UNIT
[04/04/08 06:34:32]	Call Activity Update - PTT-ID Update	225096	FG 2	Act/Busy Stat = Global Active	E26 OIC: Do you want me to go ahead and make this run?
[04/04/08 06:34:35]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Yeah, why don't you head this way.
[04/04/08 06:34:36]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:34:39]	Call Activity Update - PTT-ID Update	225018	FG 2	Deregistered by ISP	E25 OIC: Engine 25 for Command.
[04/04/08 06:34:39]	Radio Status Traffic - Subscriber Reject	225019	FG 2	Act/Busy Stat = Global Active	
[04/04/08 06:34:40]	Radio Status Traffic - Subscriber Reject	225096	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:34:42]	Call Activity Update - PTT-ID Update	225096	FG 2	Reason for Busy = No Reason	E26 OIC: Engine 26 responding.
[04/04/08 06:34:42]	Call Activity Update - Start of New Call	225105	FD WEST	Act/Busy Stat = Global Active	SQUAD 25: Squad 25 on-scene.
[04/04/08 06:34:43]	Radio Status Traffic - Subscriber Reject	225088	FG 2	Deregistered by ISP	
[04/04/08 06:34:45]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Squad 25 on-scene, 6:34.
[04/04/08 06:34:45]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Engine 25, go ahead.
[04/04/08 06:34:48]	Call Activity Update - PTT-ID Update	225018	FG 2	Act/Busy Stat = Global Active	E25 OIC: 25 for Command, per Firefighter [E102 FF#2], he was on Crew 1. He has lost contact with his crew at this point. He does not know where they're at. We need to do a PAR.
[04/04/08 06:34:50]	Mobility Update - Group Affiliation	225061	FG 2		
[04/04/08 06:34:52]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:35:00]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Okay. Is he inside or outside the structure?
[04/04/08 06:35:04]	Call Activity Update - PTT-ID Update	225018	FG 2	Act/Busy Stat = Global Active	E25 OIC: Outside the structure. He advised he was humping hose in and lost contact with his crew.
[04/04/08 06:35:07]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:35:11]	Call Activity Update - PTT-ID Update	225088	FG 2	Accepted	D-25: Okay, that's clear. Rear from command.
[04/04/08 06:35:14]	Mobility Update - Group Affiliation	225022	FG 2	Accepted	
[04/04/08 06:35:17]	Call Activity Update - PTT-ID Update	225007	FG 2	Act/Busy Stat = Global Active	Car 2508: Command from rear, go ahead.
[04/04/08 06:35:20]	Call Activity Update - PTT-ID Update	225088	FG 2	Accepted	D-25: One last time, have you seen Interior 1? I have not had any radio contact with them within the last five minutes.
[04/04/08 06:35:25]	Mobility Update - Group Affiliation	225039	FG 2	Accepted	
[04/04/08 06:35:27]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:35:28]	Call Activity Update - PTT-ID Update	225007	FG 2	Act/Busy Stat = Global Active	Car 2508: Negative on contact with Interior 1. I've got three from 109's back here with me.
[04/04/08 06:35:34]	Call Activity Update - PTT-ID Update	225088	FG 2	Accepted	D-25: Okay. Can you guys make entry from the rear safely? I'm concerned that we haven't got anybody on that crew. I'm considering calling a mayday.
[04/04/08 06:35:40]	Mobility Update - Group Affiliation	225025	FG 2	Accepted	
[04/04/08 06:35:44]	Call Activity Update - PTT-ID Update	225007	FG 2	Accepted	Car 2508: We'll see if we get the line around and get it from the back.
[04/04/08 06:35:48]	Mobility Update - Group Affiliation	256XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:35:49]	Mobility Update - Group Affiliation	225032	FD WEST	Accepted	

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:35:50]	Mobility Update - Group Affiliation	225032	FG 2	Reason = Disconnect complete	
[04/04/08 06:35:50]	Call Activity Update - PTT-ID Update	225088	FG 2	Accepted	D-25: Engine 25 from Command.
[04/04/08 06:35:50]	Mobility Update - Group Affiliation	289XXX	FG 2	Act/Busy Stat = Global Active	***NON-RESPONDING UNIT
[04/04/08 06:35:58]	Mobility Update - Group Affiliation	225042	FD WEST	Accepted	
[04/04/08 06:36:01]	Mobility Update - Group Affiliation	242036	FD WEST	Accepted	
[04/04/08 06:36:03]	Call Activity Update - Start of New Call	225042	FD WEST	Accepted	ENGINE 26: Engine 26.
[04/04/08 06:36:06]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Engine 26, go ahead.
[04/04/08 06:36:08]	Call Activity Update - PTT-ID Update	225042	FD WEST	Reason for Busy = No Reason	ENGINE 26: Add us to the structure fire on Dunlap. Show us en route.
[04/04/08 06:36:09]	Mobility Update - Group Affiliation	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:36:09]	Mobility Update - Group Affiliation	256XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:36:13]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Engine 26 en route, 5708 Squirrels Nest Lane, at 6:36. Utilize Fire Ground 2.
[04/04/08 06:36:13]	Call Activity Update - Start of New Call	225037	FG 2	Accepted	SQ25: Squad 25 on scene.
[04/04/08 06:36:16]	Mobility Update - Group Affiliation	225005	FG 11	Accepted	
[04/04/08 06:36:18]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:36:29]	Call Activity Update - Start of New Call	225088	FG 2	Reason = Disconnect complete	D-25: Engine 25 from Command.
[04/04/08 06:36:40]	Mobility Update - Group Affiliation	225026	FG 2	Accepted	
[04/04/08 06:36:40]	Call Activity Update - Start of New Call	225026	FG 2	Reason for Busy = No Reason	RADIO NO. 225026: [Open microphone].
[04/04/08 06:36:40]	Mobility Update - Group Affiliation	283XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:36:42]	Call Activity Update - PTT-ID Update	225019	FG 2	#144, Stealth Reject	E25 FAO: Command from 25 FAO, I'm moving forward to that position. Would you like me to relay traffic for them?
[04/04/08 06:36:42]	Radio Status Traffic - Subscriber Reject	225084	FG 2	Act/Busy Stat = Global Active	
[04/04/08 06:36:43]	Mobility Update - Group Affiliation	239XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:36:44]	Mobility Update - Location Registration	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:36:47]	Mobility Update - Group Affiliation	283XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:36:48]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Affirmative. I want to activate the RAT crew. I cannot make contact with Interior 1.
[04/04/08 06:36:50]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:36:56]	Call Activity Update - PTT-ID Update	225019	FG 2	Act/Busy Stat = Global Active	E25 FAO: 25 FAO, that's clear. We'll go ahead and assume RAT 25, and we'll start our RAT procedures.
[04/04/08 06:37:01]	Mobility Update - Group Affiliation	225026	FG 2	Accepted	
[04/04/08 06:37:02]	Radio Status Traffic - Subscriber Reject	225029	FG 2	Accepted	
[04/04/08 06:37:05]	Mobility Update - Group Affiliation	213XXX	FG 2	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 06:37:05]	Call Activity Update - Start of New Call	225052	FD WEST	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:37:07]	Call Activity Update - PTT-ID Update	225088	FG 2	Accepted	D-25: Okay. I don't have any other help here, so I'm going to be doing both RAT work and command at the same time.
[04/04/08 06:37:09]	Mobility Update - Group Affiliation	225081	FG 2	Accepted	
[04/04/08 06:37:14]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:37:16]	Call Activity Update - PTT-ID Update	225019	FG 2	Act/Busy Stat = Global Active	E25 FAO: RAT 25, that's clear. I believe Car 1 just pulled up to the end of the driveway.
[04/04/08 06:37:18]	Radio Status Traffic - Subscriber Reject	225029	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:37:24]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:37:25]	Call Activity Update - Start of New Call	225007	FG 2	Reason for Busy = No Reason	Car 2508: Rear to Command, we're at the back door. We can knock it down from here. Likewise, it's communicated to the second floor.
[04/04/08 06:37:25]	Radio Status Traffic - Subscriber Reject	225088	FG 2	#144, Stealth Reject	

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### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:37:28]	Mobility Update - Group Affiliation	242009	FG 2	Accepted	
[04/04/08 06:37:29]	Mobility Update - Group Affiliation	242009	FG 2	Accepted	
[04/04/08 06:37:31]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:37:33]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Okay, that's clear. Any word on Interior 1 yet?
[04/04/08 06:37:38]	Call Activity Update - PTT-ID Update	225007	FG 2	Act/Busy Stat = Global Active	Car 2508: None whatsoever, sir.
[04/04/08 06:37:41]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Okay, let's consider this a mayday situation, and let's send in the RAT crew and see if we can locate them. Plus, we still have to fight this fire.
[04/04/08 06:37:47]	Radio Status Traffic - Subscriber Reject	225029	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:37:50]	Call Activity Update - PTT-ID Update	225025	FG 2	Reason for Busy = No Reason	
[04/04/08 06:37:52]	Mobility Update - Location Registration	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:37:53]	Call Activity Update - PTT-ID Update	225029	FG 2	Act/Busy Stat = Global Active	
[04/04/08 06:37:53]	Call Activity Update - Start of New Call	225052	FD WEST	Act/Busy Stat = Global Active	D-25: Squirrels Nest Command, give me a second alarm for this incident.
[04/04/08 06:37:54]	Radio Status Traffic - Subscriber Reject	225101	FG 2	#144, Stealth Reject	
[04/04/08 06:37:57]	Radio Status Traffic - Subscriber Reject	225081	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:37:58]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Squirrelsnest command, that's clear.
[04/04/08 06:37:59]	Call Activity Update - PTT-ID Update	225029	FG 2	Act/Busy Stat = Global Active	L25 OIC: Ladder 25, Command from Ladder 25.
[04/04/08 06:37:59]	Mobility Update - Group Affiliation	225059	FG 2	Accepted	
[04/04/08 06:38:00]	Mobility Update - Group Affiliation	256XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:38:01]	Mobility Update - Group Affiliation	248XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:38:06]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Go ahead.
[04/04/08 06:38:10]	Mobility Update - Group Affiliation	253XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:38:11]	Radio Status Traffic - Subscriber Reject	253XXX	FD WEST	#147, Talkgroup request was made on a regrouped Talkgroup	***NON-RESPONDING UNIT
[04/04/08 06:38:12]	Call Activity Update - Start of New Call	253XXX	FD WEST	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 06:38:18]	Mobility Update - Group Affiliation	157XXX	FG 2	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 06:38:18]	Call Activity Update - Start of New Call	225029	FG 2	Accepted	L25 OIC: Command from Ladder 25.
[04/04/08 06:38:21]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Ladder 25, go ahead.
[04/04/08 06:38:22]	Radio Status Traffic - Subscriber Reject	225026	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:38:23]	Mobility Update - Group Affiliation	245XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:38:24]	Call Activity Update - PTT-ID Update	225029	FG 2	Accepted	L25 OIC: Be advised, thermal imaging camera is showing the upper steps to the basement are completely blocked with fire. No sign of any injured crew in that area.
[04/04/08 06:38:25]	Mobility Update - Group Affiliation	225097	FG 2	Accepted	
[04/04/08 06:38:28]	Radio Status Traffic - Subscriber Reject	225084	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:38:29]	Radio Status Traffic - Subscriber Reject	225084	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:38:33]	Radio Status Traffic - Subscriber Reject	225084	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:38:41]	Mobility Update - Group Affiliation	242004	FD WEST	Accepted	

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### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:38:43]	Call Activity Update - PTT-ID Update	225088	FG 2	Accepted	D-25: Okay. We have a mayday situation here. All units on scene switch to Channel 11. We have a mayday situation. We will continue to fight the fire, and we need to make entry with the RAT team.
[04/04/08 06:38:46]	Mobility Update - Group Affiliation	227007	FD WEST	Accepted	
[04/04/08 06:38:47]	Call Activity Update - Start of New Call	4002	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:38:49]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Attention Engine 103, Engine 28, Fairfield Rescue, Ladder 42, Ross Engine 11, Colerain Township Fire, second alarm for 5708 Squirrelsnest Lane. Attention Engine 103, Engine 28, Fairfield Rescue, Ladder 42, Ross Engine 11, Colerain Township Fire, second alarm for 5708 Squirrelsnest Lane, it's a structure fire in the basement. Utilize Fire Ground 2. 6:39.
[04/04/08 06:38:49]	Mobility Update - Group Affiliation	222XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:38:54]	Mobility Update - Group Affiliation	268XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:38:59]	Call Activity Update - PTT-ID Update	225029	FG 2	Act/Busy Stat = Global Active	L25 OIC: Ladder 25, be advised there's no way we can make entry. We're going to have to knock the fire down before we make entry.
[04/04/08 06:39:00]	Radio Status Traffic - Subscriber Reject	225018	FG 2	Accepted	
[04/04/08 06:39:00]	Mobility Update - Group Affiliation	225026	FG 11	Accepted	
[04/04/08 06:39:00]	NON RADIO INFORMATION		FG 11		MAYDAY CHANNEL 11 ASSIGNED AT 06:39:00
[04/04/08 06:39:01]	Radio Status Traffic - Subscriber Reject	225019	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:39:02]	Mobility Update - Group Affiliation	225030	FG 11	Accepted	
[04/04/08 06:39:07]	Mobility Update - Group Affiliation	225020	FG 11	Accepted	
[04/04/08 06:39:08]	Mobility Update - Group Affiliation	225085	FG 11	Accepted	
[04/04/08 06:39:08]	Call Activity Update - PTT-ID Update	225088	FG 2	Accepted	D-25: We've got to get this mayday going though.
[04/04/08 06:39:10]	Mobility Update - Group Affiliation	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:39:12]	Mobility Update - Group Affiliation	225032	FG 11	Accepted	
[04/04/08 06:39:13]	Call Activity Update - PTT-ID Update	225007	FG 2	#144, Stealth Reject	Car 2508: Rear to Command, we've got some of the first floor knocked down. The second floor has flashed out the rear. We're going to try to get water on it from back here now.
[04/04/08 06:39:13]	Radio Status Traffic - Subscriber Reject	225018	FG 2	Act/Busy Stat = Global Active	
[04/04/08 06:39:13]	Mobility Update - Group Affiliation	225020	FD WEST	Accepted	
[04/04/08 06:39:14]	Mobility Update - Group Affiliation	225034	FG 11	Accepted	
[04/04/08 06:39:15]	Mobility Update - Group Affiliation	225020	FG 2	Accepted	
[04/04/08 06:39:16]	Mobility Update - Group Affiliation	225025	FD WEST	Accepted	
[04/04/08 06:39:16]	Mobility Update - Group Affiliation	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:39:19]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:39:19]	Mobility Update - Group Affiliation	248XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:39:21]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Command clear. Switch to Channel 11. Make sure all crews are on Channel 11.
[04/04/08 06:39:23]	Radio Status Traffic - Subscriber Reject	225018	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:39:23]	Mobility Update - Group Affiliation	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:39:23]	Mobility Update - Group Affiliation	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:39:24]	Mobility Update - Group Affiliation	225098	FD WEST	Accepted	
[04/04/08 06:39:25]	Mobility Update - Group Affiliation	225025	FG 2	Accepted	
[04/04/08 06:39:27]	Mobility Update - Group Affiliation	157XXX	FG 11	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:39:27]	Call Activity Update - PTT-ID Update	225019	FG 2	Act/Busy Stat = Global Active	E25 FAO: Command from RAT 25, be advised that RAT 25's passport is still on Engine 25. I'm not sure if we have established accountability [inaudible]. Rescue 26 and RAT 25's passports are in the officer's seat of Engine 25 at the top of the driveway.
[04/04/08 06:39:27]	Mobility Update - Group Affiliation	245XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:39:28]	Radio Status Traffic - Subscriber Reject	225018	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:39:29]	Mobility Update - Group Affiliation	225008	FG 11	Accepted	
[04/04/08 06:39:29]	Call Activity Update - Start of New Call	225052	FD WEST	Reason for Busy = No Reason	D-25: Squirrelsnest Command, we have come to a Mayday situation here. Can you activate the emergency notification tones?
[04/04/08 06:39:29]	Mobility Update - Group Affiliation	227007	FG 2	Accepted	
[04/04/08 06:39:29]	Mobility Update - Group Affiliation	242046	FD WEST	Accepted	
[04/04/08 06:39:29]	Mobility Update - Group Affiliation	256XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:39:30]	Mobility Update - Group Affiliation	296XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:39:32]	Mobility Update - Group Affiliation	225007	FG 11	Accepted	
[04/04/08 06:39:32]	Call Activity Update - PTT-ID Update	225019	FG 2	Act/Busy Stat = Global Active	
[04/04/08 06:39:33]	Mobility Update - Group Affiliation	256XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:39:34]	Mobility Update - Group Affiliation	225029	FG 11	Accepted	
[04/04/08 06:39:35]	Mobility Update - Group Affiliation	225081	FG 11	Accepted	
[04/04/08 06:39:35]	Mobility Update - Group Affiliation	225098	FG 11	Accepted	
[04/04/08 06:39:37]	Mobility Update - Group Affiliation	225033	FG 11	Accepted	
[04/04/08 06:39:38]	Mobility Update - Group Affiliation	225037	FG 11	Accepted	
[04/04/08 06:39:38]	Mobility Update - Group Affiliation	225101	FG 11	Accepted	
[04/04/08 06:39:38]	Mobility Update - Group Affiliation	253XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:39:39]	Radio Status Traffic - Subscriber Reject	253XXX	FD WEST	#147, Talkgroup request was made on a regrouped Talkgroup	***NON-RESPONDING UNIT
[04/04/08 06:39:40]	Mobility Update - Group Affiliation	225022	FG 11	Accepted	
[04/04/08 06:39:40]	Call Activity Update - PTT-ID Update	253XXX	FD WEST	Act/Busy Stat = Global Active	***NON-RESPONDING UNIT
[04/04/08 06:39:40]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:39:42]	Mobility Update - Group Affiliation	213XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:39:42]	Mobility Update - Group Affiliation	225094	FG 11	Accepted	
[04/04/08 06:39:43]	Call Activity Update - Start of New Call	225030	FG 11	Reason for Busy = No Reason	L25 ATO: Ladder 25 exterior, we have positive pressure to the front door and have started. Requesting another assignment.
[04/04/08 06:39:43]	Radio Status Traffic - Subscriber Reject	225081	FG 11	#144, Stealth Reject	
[04/04/08 06:39:43]	Mobility Update - Group Affiliation	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:39:45]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: That's clear.
[04/04/08 06:39:45]	Mobility Update - Group Affiliation	247XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:39:46]	Mobility Update - Group Affiliation	227001	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:39:48]	Mobility Update - Group Affiliation	256XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:39:49]	Call Activity Update - PTT-ID Update	225054	FD WEST	Act/Busy Stat = Global Active	ENGINE 103: Engine 103 is en route.
[04/04/08 06:39:49]	Mobility Update - Group Affiliation	225069	FG 2	Accepted	
[04/04/08 06:39:51]	Mobility Update - Group Affiliation	206XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:39:52]	Mobility Update - Group Affiliation	225105	FG 2	Accepted	
[04/04/08 06:39:52]	Mobility Update - Group Affiliation	278XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:39:53]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:39:54]	Mobility Update - Group Affiliation	242028	FD WEST	Accepted	
[04/04/08 06:39:55]	Call Activity Update - Start of New Call	225088	FG 2	Reason for Busy = No Reason	D-25: Unit calling, you were very broken. Repeat your traffic.

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:39:56]	Call Activity Update - Start of New Call	4002	FD WEST	Reason for Busy = No Reason	HCCC: Engine 103 en route, 5708 Squirrelsnest, 6:39.
[04/04/08 06:39:58]	Mobility Update - Group Affiliation	225084	FG 11	Accepted	
[04/04/08 06:39:58]	Mobility Update - Group Affiliation	225084	FG 11	Accepted	
[04/04/08 06:40:01]	Mobility Update - Group Affiliation	225086	FG 11	Accepted	
[04/04/08 06:40:01]	Mobility Update - Group Affiliation	264XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:40:02]	Call Activity Update - Start of New Call	225019	FG 2	Reason for Busy = No Reason	E25 FAO: RAT 25 for Command, information only, passport and accountability passport for RAT 25, as well as Rescue 26, is on the front seat of Engine 25. I was attempting to establish accountability when the mayday went out. Advise our accountability officer that the passports are in the officer's seat.
[04/04/08 06:40:03]	Call Activity Update - Start of New Call	225029	FG 11	Reason for Busy = No Reason	
[04/04/08 06:40:07]	Call Activity Update - PTT-ID Update	225084	FG 11	Act/Busy Stat = Global Active	Unidentified opened microphone
[04/04/08 06:40:07]	Mobility Update - Group Affiliation	227005	FD WEST	Accepted	
[04/04/08 06:40:09]	Call Activity Update - PTT-ID Update	225084	FG 11	Act/Busy Stat = Global Active	
[04/04/08 06:40:10]	Call Activity Update - PTT-ID Update	225084	FG 11	Act/Busy Stat = Global Active	
[04/04/08 06:40:10]	Mobility Update - Group Affiliation	256XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:40:12]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:40:16]	Call Activity Update - Start of New Call	225029	FG 11	Reason for Busy = No Reason	L25 OIC: Command from Ladder 25, interior one
[04/04/08 06:40:18]	Mobility Update - Group Affiliation	268XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:40:19]	Mobility Update - Group Affiliation	242004	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:40:21]	Mobility Update - Group Affiliation	157XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:40:21]	Mobility Update - Group Affiliation	225062	FD WEST	Accepted	
[04/04/08 06:40:21]	Mobility Update - Group Affiliation	227007	FD WEST	Accepted	
[04/04/08 06:40:27]	Mobility Update - Group Affiliation	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:40:27]	Mobility Update - Group Affiliation	247XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:40:31]	Mobility Update - Group Affiliation	256XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:40:31]	Mobility Update - Group Affiliation	278XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:40:32]	Mobility Update - Group Affiliation	225022	FG 2	Accepted	
[04/04/08 06:40:34]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Okay, I got a pretty good amount of that. Make sure your mic is a little further away from your speaking diaphragm.
[04/04/08 06:40:37]	Mobility Update - Group Affiliation	278XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:40:40]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	D-25: Unit calling Command, go ahead.
[04/04/08 06:40:42]	Call Activity Update - PTT-ID Update	225019	FG 2	Act/Busy Stat = Global Active	E25 FAO: RAT 25, okay.
[04/04/08 06:40:44]	Call Activity Update - PTT-ID Update	225029	FG 11	Act/Busy Stat = Global Active	L25 OIC: We're going to need a third line
[04/04/08 06:40:48]	Call Activity Update - Start of New Call	225001	FG 2	Reason for Busy = No Reason	Car 2501: Car 1 to Command, I'm on my way down, but what do you want me to do? I'm up at the street yet.
[04/04/08 06:40:52]	Mobility Update - Group Affiliation	256XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:40:53]	Call Activity Update - Start of New Call	253XXX	FD WEST	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 06:40:54]	Mobility Update - Group Affiliation	225022	FG 11	Accepted	
[04/04/08 06:40:55]	Call Activity Update - Start of New Call	225007	FG 11	Reason for Busy = No Reason	Car 2508: Rear to Command, can we deploy a two-and-a-half back here?
[04/04/08 06:40:55]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: I'm going to need help with this mayday operation in the car.
[04/04/08 06:40:57]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	
[04/04/08 06:40:58]	Mobility Update - Group Affiliation	266XXX	FG 2	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:41:01]	Call Activity Update - Start of New Call	4002	FD WEST	Reason for Busy = No Reason	[MAYDAY ALERT TONE]. HCCC: Attention all companies, attention all companies, reference the Squirrelsnest fire, this is a Mayday operation. Repeating, attention all fire units on the Squirrelsnest Lane incident, this is now a Mayday operation. Fire Ground 11 is now being assigned. Repeating, this is a Mayday operation for Squirrelsnest Lane. Fire Ground 11 is now assigned. Repeating, Mayday 1, Fire Ground 11 is now assigned.
[04/04/08 06:41:02]	Call Activity Update - PTT-ID Update	225001	FG 2	Act/Busy Stat = Global Active	Car 2501: Okay. You might set off a second staff notification and get some more equipment down here.
[04/04/08 06:41:09]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: All right. I've already sent out a second alarm. They're on their way. We'll be operating on Channel 11 for operations.
[04/04/08 06:41:10]	Call Activity Update - PTT-ID Update	8007	FG 2	Act/Busy Stat = Global Active	[ALERT TONE 3].
[04/04/08 06:41:15]	Call Activity Update - PTT-ID Update	8007	FG 2	Act/Busy Stat = Global Active	HCCC: Attention all companies, attention all companies, reference the Squirrelsnest fire, this is a mayday operation. Repeating: Attention all fire units on the Squirrelsnest Lane incident, this is now a mayday operation. Fire Ground 11 is now being assigned. Repeating: This is a mayday operation for Squirrelsnest Lane. Fire Ground 11 is now assigned. Repeating: Mayday 1, Fire Ground 11 is now assigned.
[04/04/08 06:41:21]	Mobility Update - Group Affiliation	Schira	FG 2	Accepted	(Possible radio degradation by extreme heat)
[04/04/08 06:41:22]	Call Activity Update - Start of New Call	225030	FG 11	Reason for Busy = No Reason	L25 ATO: Command from ladder exterior
[04/04/08 06:41:27]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	D-25: Go ahead.
[04/04/08 06:41:31]	Call Activity Update - PTT-ID Update	225030	FG 11	Act/Busy Stat = Global Active	L25 ATO: Positive pressure has been set up at the front door. Requesting second assignment.
[04/04/08 06:41:38]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	D-25: Okay. We need an additional line to the rear of the structure.
[04/04/08 06:41:39]	Mobility Update - Group Affiliation	227014	FG 11	Accepted	
[04/04/08 06:41:41]	Mobility Update - Group Affiliation	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:41:42]	Mobility Update - Group Affiliation	239XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:41:43]	Call Activity Update - PTT-ID Update	225007	FG 11	Act/Busy Stat = Global Active	Car 2508: Command from the rear, if that could be a two-and-a-half, that would be great.
[04/04/08 06:41:43]	Mobility Update - Group Affiliation	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:41:44]	Radio Status Traffic - Subscriber Reject	225030	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:41:44]	Mobility Update - Group Affiliation	245XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:41:44]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:41:44]	Mobility Update - Group Affiliation	308116	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:41:45]	Mobility Update - Group Affiliation	225063	FD WEST	Accepted	
[04/04/08 06:41:45]	Mobility Update - Group Affiliation	242003	FG 11	Accepted	
[04/04/08 06:41:46]	Mobility Update - Group Affiliation	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:41:47]	Call Activity Update - Start of New Call	227024	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:41:47]	Mobility Update - Group Affiliation	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:41:48]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	D-25: [L25 ATO], they need a two-and-a-half.
[04/04/08 06:41:48]	Mobility Update - Group Affiliation	227001	FG 11	Accepted	
[04/04/08 06:41:49]	Mobility Update - Group Affiliation	242011	FG 11	Accepted	
[04/04/08 06:41:49]	Mobility Update - Group Affiliation	242013	FD WEST	Accepted	
[04/04/08 06:41:50]	Mobility Update - Group Affiliation	264XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:41:50]	Mobility Update - Group Affiliation	273XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:41:50]	Mobility Update - Group Affiliation	278XXX	FG 11	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:41:51]	Mobility Update - Group Affiliation	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:41:52]	Mobility Update - Group Affiliation	242026	FG 11	Accepted	
[04/04/08 06:41:52]	Mobility Update - Group Affiliation	268XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:41:53]	Radio Status Traffic - Subscriber Reject	225030	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:41:53]	Call Activity Update - PTT-ID Update	225052	FD WEST	Act/Busy Stat = Global Active	D-25: Squirrelsnest Command. Give me an additional staff notification and put in the words "Mayday operation."
[04/04/08 06:41:53]	Mobility Update - Group Affiliation	227005	FG 11	Accepted	
[04/04/08 06:41:53]	Call Activity Update - PTT-ID Update	242011	FG 11	Act/Busy Stat = Global Active	LADDER 42: Ladder 42 on 11.
[04/04/08 06:41:54]	Mobility Update - Group Affiliation	268XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:41:55]	Mobility Update - Group Affiliation	242013	FG 11	Accepted	
[04/04/08 06:41:55]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:41:57]	Mobility Update - Group Affiliation	242006	FD WEST	Accepted	
[04/04/08 06:41:58]	Mobility Update - Group Affiliation	206XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:41:59]	Call Activity Update - PTT-ID Update	225052	FD WEST	Act/Busy Stat = Global Active	D-25: Squirrelsnest Command. If you would, give me an additional two EMS or two transport units.
[04/04/08 06:41:59]	Mobility Update - Group Affiliation	256XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:41:59]	Mobility Update - Group Affiliation	273XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:00]	Mobility Update - Group Affiliation	286XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:01]	Call Activity Update - Start of New Call	225018	FG 2	Reason for Busy = No Reason	E25 OIC: RAT 25 for Command, be advised we're making entry into the
[04/04/08 06:42:01]	Mobility Update - Location Registration	256XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:01]	Mobility Update - Group Affiliation	295XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:02]	Mobility Update - Group Affiliation	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:03]	Mobility Update - Group Affiliation	206XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:03]	Mobility Update - Group Affiliation	242006	FG 11	Accepted	
[04/04/08 06:42:04]	Mobility Update - Group Affiliation	245XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:06]	Mobility Update - Group Affiliation	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:06]	Mobility Update - Group Affiliation	268XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:07]	Mobility Update - Group Affiliation	206XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:07]	Mobility Update - Group Affiliation	242047	FD WEST	Accepted	
[04/04/08 06:42:12]	Mobility Update - Group Affiliation	245XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:13]	Mobility Update - Group Affiliation	227007	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:14]	Mobility Update - Group Affiliation	242049	FD WEST	Accepted	
[04/04/08 06:42:14]	Mobility Update - Group Affiliation	296XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:15]	Mobility Update - Group Affiliation	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:16]	Call Activity Update - Start of New Call	253XXX	FG 11	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 06:42:17]	Mobility Update - Location Registration	157XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:17]	Call Activity Update - Start of New Call	225052	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:42:18]	Radio Status Traffic - Subscriber Reject	225030	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:42:18]	Mobility Update - Group Affiliation	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:25]	Call Activity Update - Start of New Call	225025	FG 2	Reason for Busy = No Reason	
[04/04/08 06:42:26]	Call Activity Update - PTT-ID Update	225025	FG 2	Act/Busy Stat = Global Active	
[04/04/08 06:42:27]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Squirrelsnest command, would you like a third alarm?
[04/04/08 06:42:27]	Mobility Update - Group Affiliation	296XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:28]	Mobility Update - Group Affiliation	256XXX	FG 2	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:42:28]	Mobility Update - Group Affiliation	403123	FD WEST	Accepted	
[04/04/08 06:42:30]	Mobility Update - Group Affiliation	242047	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:33]	Call Activity Update - PTT-ID Update	225052	FD WEST	Act/Busy Stat = Global Active	D-25: Negative on the third alarm. Just make sure I have two additional EMS transports.
[04/04/08 06:42:36]	Mobility Update - Group Affiliation	225015	FG 11	Accepted	
[04/04/08 06:42:39]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Copy, two additional transport units needed.
[04/04/08 06:42:39]	Mobility Update - Group Affiliation	242009	FG 11	Accepted	
[04/04/08 06:42:43]	Call Activity Update - Start of New Call	225091	FG 2	Reason for Busy = No Reason	*
[04/04/08 06:42:44]	Mobility Update - Group Affiliation	206XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:44]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:44]	Mobility Update - Group Affiliation	256XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:46]	Mobility Update - Group Affiliation	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:46]	Mobility Update - Group Affiliation	292XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:47]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	D-25: Rear sector from Command, do we have any indication from Interior1?
[04/04/08 06:42:47]	Mobility Update - Group Affiliation	242020	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:47]	Call Activity Update - Start of New Call	Schira	FG 2	Reason for Busy = No Reason	(Possible radio degradation by extreme heat)
[04/04/08 06:42:48]	Call Activity Update - Start of New Call	225062	FD WEST	Reason for Busy = No Reason	TANKER 109: Tanker 109 en route to Squirrelsnest.
[04/04/08 06:42:48]	Mobility Update - Group Affiliation	256XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:49]	Call Activity Update - PTT-ID Update	Schira	FG 2	Act/Busy Stat = Global Active	(Possible radio degradation by extreme heat)
[04/04/08 06:42:50]	Mobility Update - Group Affiliation	278XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:53]	Call Activity Update - PTT-ID Update	225007	FG 11	Act/Busy Stat = Global Active	Car 2508: None so ever. We're moving an inch-and-three-quarter line into the rear door along with the RAT teams.
[04/04/08 06:42:54]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Tanker 109 en route, Squirrelsnest, 6:42, utilizing Fire Ground 2 -- correction, Fire Ground 11, Fire Ground 11.
[04/04/08 06:42:56]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:57]	Mobility Update - Group Affiliation	242020	FD WEST	Accepted	
[04/04/08 06:42:57]	Mobility Update - Group Affiliation	283XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:58]	Mobility Update - Group Affiliation	239XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:42:58]	Mobility Update - Group Affiliation	242049	FD WEST	Accepted	
[04/04/08 06:43:00]	Mobility Update - Location Registration	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:43:01]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Staff notification for Colerain Township Fire for Mayday operations on Squirrelsnest Lane. This is a staff notification for Colerain Township Fire, reference the Squirrelsnest Lane detail. This is now a Mayday operation. Fire Ground 11 assigned for Mayday 1. 6:43.
[04/04/08 06:43:01]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	D-25: Command clear.
[04/04/08 06:43:01]	Mobility Update - Group Affiliation	278XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:43:01]	Mobility Update - Group Affiliation	292XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:43:01]	Mobility Update - Group Affiliation	292XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:43:02]	Mobility Update - Group Affiliation	286XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:43:04]	Mobility Update - Group Affiliation	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:43:05]	Mobility Update - Location Registration	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:43:06]	Mobility Update - Group Affiliation	225082	FG 11	Accepted	
[04/04/08 06:43:07]	Mobility Update - Group Affiliation	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:43:08]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	D-25: Rear from Command, I want to identify who we don't have an accountability for. So we're going to do a PAR.
[04/04/08 06:43:09]	Mobility Update - Location Registration	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:43:12]	Mobility Update - Group Affiliation	292XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:43:15]	Mobility Update - Group Affiliation	239XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:43:16]	Mobility Update - Group Affiliation	268XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:43:18]	Call Activity Update - Start of New Call	227024	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:43:19]	Call Activity Update - PTT-ID Update	225026	FG 11	Act/Busy Stat = Global Active	
[04/04/08 06:43:19]	Mobility Update - Group Affiliation	242020	FG 2	Accepted	
[04/04/08 06:43:21]	Mobility Update - Location Registration	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:43:21]	Mobility Update - Group Affiliation	266XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:43:30]	Mobility Update - Group Affiliation	222XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:43:30]	Mobility Update - Group Affiliation	227007	FG 11	Accepted	
[04/04/08 06:43:32]	Mobility Update - Group Affiliation	225059	FG 11	Accepted	
[04/04/08 06:43:35]	Mobility Update - Group Affiliation	242049	FG 2	Accepted	
[04/04/08 06:43:38]	Mobility Update - Group Affiliation	245XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:43:42]	Mobility Update - Group Affiliation	268XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:43:48]	Call Activity Update - Start of New Call	225018	FG 2	Reason for Busy = No Reason	
[04/04/08 06:43:50]	Radio Status Traffic - Subscriber Reject	225019	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:43:50]	Call Activity Update - Start of New Call	225082	FG 11	Reason for Busy = No Reason	TANKER109: Tanker 109 en route with two personnel.
[04/04/08 06:43:52]	Mobility Update - Group Affiliation	268XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:43:54]	Mobility Update - Group Affiliation	268XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:43:58]	Mobility Update - Group Affiliation	225073	FD WEST	Accepted	
[04/04/08 06:44:00]	Mobility Update - Location Registration	256XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:00]	Mobility Update - Location Registration	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:03]	Mobility Update - Location Registration	206XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:04]	Mobility Update - Group Affiliation	222XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:04]	Mobility Update - Group Affiliation	403123	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:05]	Mobility Update - Group Affiliation	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:08]	Mobility Update - Group Affiliation	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:11]	Mobility Update - Group Affiliation	268XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:13]	Mobility Update - Group Affiliation	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:14]	Mobility Update - Group Affiliation	253XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:16]	Call Activity Update - Start of New Call	225008	FG 11	Reason for Busy = No Reason	Car 2506: Command from Car 6, I'm on the scene.
[04/04/08 06:44:16]	Mobility Update - Group Affiliation	268XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:17]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:21]	Mobility Update - Group Affiliation	225102	FG 2	Accepted	
[04/04/08 06:44:24]	Mobility Update - Group Affiliation	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:24]	Mobility Update - Location Registration	256XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:25]	Mobility Update - Group Affiliation	225102	FD WEST	Accepted	
[04/04/08 06:44:26]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Command's clear. Car 6, I want you to respond down to accountability and we're going to run a PAR here. Just report down to accountability to start with.
[04/04/08 06:44:26]	Mobility Update - Group Affiliation	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:28]	Mobility Update - Group Affiliation	242010	FG 11	Accepted	
[04/04/08 06:44:32]	Mobility Update - Location Registration	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:37]	Mobility Update - Group Affiliation	403001	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:38]	Mobility Update - Group Affiliation	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:38]	Mobility Update - Group Affiliation	256XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:38]	Mobility Update - Group Affiliation	403123	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:45]	Call Activity Update - Start of New Call	225029	FG 11	Reason for Busy = No Reason	L25 OIC: Ladder 25, 102, we need another 100 feet of two-and-a-half.

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:44:45]	Mobility Update - Group Affiliation	247XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:53]	Mobility Update - Group Affiliation	245XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:44:58]	Call Activity Update - Start of New Call	225015	FG 11	Reason for Busy = No Reason	E102 FAO: Ladder 25 from 102, I'm sending [E102 FF#2] with a couple hundred feet of inch-and-three-quarter. Would you rather have two-and-a-half?
[04/04/08 06:45:01]	Mobility Update - Group Affiliation	239XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:45:03]	Mobility Update - Group Affiliation	242049	FG 11	Accepted	
[04/04/08 06:45:05]	Mobility Update - Location Registration	157XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:45:05]	Mobility Update - Group Affiliation	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:45:06]	Mobility Update - Group Affiliation	225102	FG 2	Accepted	
[04/04/08 06:45:07]	Mobility Update - Group Affiliation	247XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:45:08]	Call Activity Update - PTT-ID Update	225029	FG 11	Act/Busy Stat = Global Active	L25 OIC: Yes.
[04/04/08 06:45:10]	Mobility Update - Group Affiliation	239XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:45:12]	Call Activity Update - Start of New Call	4002	FD WEST	Reason for Busy = No Reason	HCCC: Attention Squad 225, Squad 26, respond 5708 Squirrelsnest Lane, additional transport units needed. Attention Squad 225, Squad 26, respond 5708 Squirrelsnest Lane for two additional transport units needed. Utilize Fire Ground 11. Repeating, Fire Ground 11. Cross street of Dunlap, at 6:45.
[04/04/08 06:45:12]	Mobility Update - Group Affiliation	268XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:45:13]	Mobility Update - Group Affiliation	245XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:45:15]	Mobility Update - Group Affiliation	242049	FD WEST	Accepted	
[04/04/08 06:45:16]	Call Activity Update - Start of New Call	225015	FG 11	Reason for Busy = No Reason	E102 FAO: Ladder 25, did you copy?
[04/04/08 06:45:17]	Radio Status Traffic - Subscriber Reject	225029	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:45:20]	Call Activity Update - PTT-ID Update	225029	FG 11	Act/Busy Stat = Global Active	L25 OIC: Ladder 25, inch-and-three-quarter will be fine.
[04/04/08 06:45:21]	Mobility Update - Location Registration	206XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:45:22]	Call Activity Update - Start of New Call	225088	FG 2	Reason for Busy = No Reason	D-25: RAT from Command.
[04/04/08 06:45:26]	Call Activity Update - PTT-ID Update	225015	FG 11	Act/Busy Stat = Global Active	E102 FAO: That's clear. He's coming around the house now.
[04/04/08 06:45:29]	Mobility Update - Group Affiliation	242049	FD WEST	Accepted	
[04/04/08 06:45:29]	Mobility Update - Group Affiliation	264XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:45:30]	Mobility Update - Group Affiliation	225072	FD WEST	Accepted	
[04/04/08 06:45:33]	Mobility Update - Group Affiliation	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:45:35]	Mobility Update - Group Affiliation	225072	FG 11	Accepted	
[04/04/08 06:45:38]	Call Activity Update - Start of New Call	225088	FG 2	Reason for Busy = No Reason	D-25: RAT 25 from command.
[04/04/08 06:45:40]	Mobility Update - Group Affiliation	225003	FD WEST	Accepted	
[04/04/08 06:45:40]	Call Activity Update - Start of New Call	225026	FG 11	Reason for Busy = No Reason	
[04/04/08 06:45:41]	Mobility Update - Group Affiliation	225025	FG 11	Accepted	
[04/04/08 06:45:41]	Mobility Update - Group Affiliation	225102	FG 11	Accepted	
[04/04/08 06:45:44]	Mobility Update - Group Affiliation	268XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:45:46]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Rear from Command.
[04/04/08 06:45:46]	Call Activity Update - Start of New Call	225018	FG 2	Reason for Busy = No Reason	E25 OIC: RAT 25 repeat.
[04/04/08 06:45:47]	Mobility Update - Location Registration	225063	FD WEST	Accepted	
[04/04/08 06:45:49]	Mobility Update - Group Affiliation	242049	FG 11	Accepted	
[04/04/08 06:45:50]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Someone give me an update.
[04/04/08 06:45:53]	Call Activity Update - PTT-ID Update	225018	FG 2	Act/Busy Stat = Global Active	E25 OIC: [Inaudible].
[04/04/08 06:45:53]	Call Activity Update - Start of New Call	225042	FD WEST	Reason for Busy = No Reason	ENGINE 26: Engine 26 on the scene.
[04/04/08 06:45:57]	Mobility Update - Group Affiliation	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:45:59]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Okay, you're going to have to move your mic from your diaphragm, you're too broken.

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:46:00]	Mobility Update - Group Affiliation	268XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:46:05]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:46:06]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Rear from Command.
[04/04/08 06:46:09]	Call Activity Update - Start of New Call	225018	FG 2	Reason for Busy = No Reason	E25 OIC: RAT 25 for command, be advised we have found a hose line coming down the steps and are continuing search.
[04/04/08 06:46:10]	Call Activity Update - PTT-ID Update	225007	FG 11	Act/Busy Stat = Global Active	Car 2508: Rear. Go ahead.
[04/04/08 06:46:12]	Mobility Update - Group Affiliation	225095	FG 11	Accepted	
[04/04/08 06:46:13]	Mobility Update - Group Affiliation	225103	FD WEST	Accepted	
[04/04/08 06:46:15]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Rear, I need a report. What are the fire conditions on the lower level?
[04/04/08 06:46:19]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	
[04/04/08 06:46:20]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	
[04/04/08 06:46:21]	Call Activity Update - PTT-ID Update	225007	FG 11	Act/Busy Stat = Global Active	Car 2508: First floor, bulk of the fire is knocked down. Second floor, we still have fire out one rear window.
[04/04/08 06:46:21]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:46:23]	Mobility Update - Group Affiliation	253XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:46:25]	Call Activity Update - PTT-ID Update	292XXX	FG 2	Act/Busy Stat = Global Active	***NON-RESPONDING UNIT
[04/04/08 06:46:27]	Mobility Update - Group Affiliation	253XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:46:29]	Call Activity Update - PTT-ID Update	225018	FG 2	Act/Busy Stat = Global Active	E25 OIC: RAT 25 to Command, have the [inaudible] hose line shut down.
[04/04/08 06:46:31]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:46:32]	Mobility Update - Group Affiliation	225047	FD WEST	Accepted	
[04/04/08 06:46:33]	Call Activity Update - PTT-ID Update	225082	FG 11	Act/Busy Stat = Global Active	
[04/04/08 06:46:34]	Radio Status Traffic - Subscriber Reject	225005	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:46:34]	Mobility Update - Group Affiliation	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:46:35]	Mobility Update - Group Affiliation	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:46:37]	Mobility Update - Group Affiliation	240XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:46:38]	Call Activity Update - Start of New Call	225088	FG 2	Reason for Busy = No Reason	D-25: RAT 25 from Command, you have to move your mic from your diaphragm. You are too broken, too much background noise. Try it again.
[04/04/08 06:46:39]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Rear from Command, are you saying a lower level fire is knocked down; second level fire out of the one window?
[04/04/08 06:46:43]	Mobility Update - Group Affiliation	225027	FG 11	Accepted	
[04/04/08 06:46:49]	Call Activity Update - PTT-ID Update	225018	FG 2	Act/Busy Stat = Global Active	E25 OIC: RAT 25 for Command, shut down the [inaudible].
[04/04/08 06:46:51]	Call Activity Update - PTT-ID Update	225007	FG 11	Act/Busy Stat = Global Active	Car 2508: Affirmative. First floor, the bulk of the fire knocked down. Second floor, at the present time, we got fire out one window. However, it appears to be growing.
[04/04/08 06:46:52]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:46:52]	Mobility Update - Group Affiliation	267XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:46:54]	Call Activity Update - PTT-ID Update	225047	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:46:54]	Mobility Update - Group Affiliation	225081	FG 11	Accepted	
[04/04/08 06:46:58]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Engine 26 on the scene at 6:45.
[04/04/08 06:46:59]	Mobility Update - Group Affiliation	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:47:05]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Okay. We're going to rely on your eyes as to how long we stay in that building until we get the fire knocked down. I don't know what kind of structure we have on the floor for that second floor, but we need to rely on your judgement.
[04/04/08 06:47:07]	Mobility Update - Group Affiliation	225016	FG 11	Accepted	
[04/04/08 06:47:07]	Call Activity Update - Start of New Call	225019	FG 2	Reason for Busy = No Reason	E25 FAO: Command from RAT 25.

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:47:07]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:47:08]	Mobility Update - Group Affiliation	225025	FG 11	Accepted	
[04/04/08 06:47:10]	Mobility Update - Group Affiliation	258XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:47:11]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: RAT Command, go ahead.
[04/04/08 06:47:11]	Mobility Update - Group Affiliation	407807	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:47:16]	Call Activity Update - PTT-ID Update	225019	FG 2	Act/Busy Stat = Global Active	E25 FAO: [Inaudible] RAT Command, if you can have Engine 102's FAO shut down the hand line that Interior 1 had because it's punctured in the stairwell free flowing.
[04/04/08 06:47:25]	Call Activity Update - Start of New Call	225007	FG 11	Reason for Busy = No Reason	Car 2508: That's clear.
[04/04/08 06:47:25]	Mobility Update - Group Affiliation	279XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:47:26]	Mobility Update - Group Affiliation	206XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:47:26]	Radio Status Traffic - Subscriber Reject	225101	FG 11	#144, Stealth Reject	
[04/04/08 06:47:27]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:47:28]	Mobility Update - Group Affiliation	225073	FG 2	Accepted	
[04/04/08 06:47:28]	Call Activity Update - PTT-ID Update	225101	FG 11	Act/Busy Stat = Global Active	E103 OIC: Command, we're on Engine 103. We're approaching the scene.
[04/04/08 06:47:28]	Mobility Update - Group Affiliation	253XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:47:29]	Radio Status Traffic - Subscriber Reject	225022	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:47:33]	Radio Status Traffic - Subscriber Reject	225022	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:47:35]	Call Activity Update - PTT-ID Update	225022	FG 11	Act/Busy Stat = Global Active	E26 OIC: Command from Engine 26, we're on the scene. We're going to walk back and report, request an assignment.
[04/04/08 06:47:36]	Mobility Update - Group Affiliation	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:47:37]	Mobility Update - Group Affiliation	227004	FD WEST	Accepted	
[04/04/08 06:47:40]	Mobility Update - Group Affiliation	225009	FG 2	Accepted	
[04/04/08 06:47:43]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Engine 102 from Command, shut down engine -- the Interior 1's line.
[04/04/08 06:47:48]	Mobility Update - Group Affiliation	292XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:47:50]	Mobility Update - Group Affiliation	227004	FG 11	Accepted	
[04/04/08 06:47:53]	Call Activity Update - Start of New Call	225015	FG 11	Reason for Busy = No Reason	E102 FAO: 102 FAO clear, shutting down No. 1 line.
[04/04/08 06:47:57]	Call Activity Update - Start of New Call	206XXX	FG 2	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 06:48:00]	Call Activity Update - Start of New Call	225103	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:48:01]	Call Activity Update - Start of New Call	225101	FG 11	Reason for Busy = No Reason	E103 OIC: Command from Engine 103, we're at the scene.
[04/04/08 06:48:02]	Mobility Update - Group Affiliation	225096	FG 2	Accepted	
[04/04/08 06:48:02]	Mobility Update - Group Affiliation	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:48:04]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Attention Colerain Township Fire recall, attention Station 25, all Colerain firefighter units respond to your respective stations, reference a general recall for Mayday operation on Fire Ground 11. Repeating, a general fire recall for Squirrelsnest Lane, a Mayday operation now in effect, Fire Ground 11.
[04/04/08 06:48:05]	Mobility Update - Group Affiliation	225009	FG 11	Accepted	
[04/04/08 06:48:06]	Mobility Update - Group Affiliation	225034	FG 2	Accepted	
[04/04/08 06:48:07]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Engine 103 from Command, bring your crews down with tools.
[04/04/08 06:48:10]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:48:11]	Mobility Update - Group Affiliation	245XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:48:11]	Mobility Update - Location Registration	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:48:15]	Mobility Update - Group Affiliation	227031	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:48:16]	Call Activity Update - PTT-ID Update	225022	FG 11	Act/Busy Stat = Global Active	E26 OIC: Engine 26 Chief, we're here also
[04/04/08 06:48:17]	Radio Status Traffic - Subscriber Reject	225101	FG 11	#71, Individual not allowed to interrupt current audio source	

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:48:18]	Mobility Update - Group Affiliation	225096	FG 11	Accepted	
[04/04/08 06:48:22]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: I copy
[04/04/08 06:48:22]	Mobility Update - Location Registration	253XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:48:22]	Mobility Update - Group Affiliation	279XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:48:22]	Mobility Update - Group Affiliation	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:48:23]	Mobility Update - Group Affiliation	225074	FD WEST	Accepted	
[04/04/08 06:48:25]	Mobility Update - Group Affiliation	248XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:48:26]	Mobility Update - Group Affiliation	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:48:27]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Ladder 42 on-scene, 6:49.
[04/04/08 06:48:31]	Mobility Update - Group Affiliation	225034	FG 11	Accepted	
[04/04/08 06:48:32]	Mobility Update - Group Affiliation	225059	FG 2	Accepted	
[04/04/08 06:48:32]	Mobility Update - Group Affiliation	225059	FG 2	Accepted	
[04/04/08 06:48:36]	Call Activity Update - Start of New Call	225015	FG 11	Reason for Busy = No Reason	E102 FAO: Command from Engine102 FAO
[04/04/08 06:48:36]	Mobility Update - Group Affiliation	253XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:48:39]	Mobility Update - Group Affiliation	225057	FG 11	Accepted	
[04/04/08 06:48:40]	Mobility Update - Group Affiliation	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:48:41]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Go ahead.
[04/04/08 06:48:44]	Call Activity Update - PTT-ID Update	225015	FG 11	Act/Busy Stat = Global Active	E102 FAO: Yes, sir. I can still see a large body of fire from the front door the C side of the structure, straight back
[04/04/08 06:48:44]	Mobility Update - Group Affiliation	245XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:48:46]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:48:50]	Mobility Update - Group Affiliation	225081	FG 11	Accepted	
[04/04/08 06:48:53]	Mobility Update - Group Affiliation	245XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:48:54]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command's clear on that. Command to rear.
[04/04/08 06:48:57]	Mobility Update - Group Affiliation	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:48:57]	Mobility Update - Group Affiliation	245XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:49:01]	Call Activity Update - PTT-ID Update	225007	FG 11	Act/Busy Stat = Global Active	Car 2508: Rear for Command, go ahead.
[04/04/08 06:49:05]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Rear, we need to concentrate on fire control. I know you're trying to do that. We need to do it safely. We need to do it from the outside. Let's do it, but let's make the evaluation of how we get this fire knocked down quickly.
[04/04/08 06:49:09]	Mobility Update - Group Affiliation	239XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:49:09]	Mobility Update - Group Affiliation	279XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:49:10]	Mobility Update - Group Affiliation	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:49:11]	Mobility Update - Group Affiliation	239XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:49:16]	Mobility Update - Group Affiliation	225057	FG 2	Accepted	
[04/04/08 06:49:23]	Call Activity Update - PTT-ID Update	225007	FG 11	Act/Busy Stat = Global Active	Car 2508: If we can get a two-and-a-half around to the back, we can knock down the second floor. We are re-advancing into the first floor with an inch-and-three-quarter line. We found the first line either cut in half or burned in half.
[04/04/08 06:49:25]	Mobility Update - Group Affiliation	225057	FG 11	Accepted	
[04/04/08 06:49:30]	Mobility Update - Group Affiliation	225059	FG 11	Accepted	
[04/04/08 06:49:30]	Mobility Update - Group Affiliation	227031	FG 11	Accepted	
[04/04/08 06:49:33]	Mobility Update - Group Affiliation	225038	FG 2	Accepted	
[04/04/08 06:49:40]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Okay, copy. Do you have enough lines to get this fire knocked down?
[04/04/08 06:49:46]	Mobility Update - Group Affiliation	225006	FD WEST	Accepted	
[04/04/08 06:49:48]	Mobility Update - Location Registration	225006	FD WEST	Accepted	
[04/04/08 06:49:49]	Call Activity Update - Start of New Call	225007	FG 11	Reason for Busy = No Reason	Car 2508: Affirmative on enough lines back here.

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:49:49]	Mobility Update - Group Affiliation	266XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:49:50]	Call Activity Update - Start of New Call	242046	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:49:51]	Mobility Update - Group Affiliation	225006	FG 2	Accepted	
[04/04/08 06:49:51]	Mobility Update - Group Affiliation	279XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:49:52]	Mobility Update - Group Affiliation	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:49:53]	Mobility Update - Group Affiliation	225097	FG 11	Accepted	
[04/04/08 06:49:54]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:49:54]	Mobility Update - Group Affiliation	225047	FG 2	Accepted	
[04/04/08 06:49:57]	Call Activity Update - Start of New Call	Broxterman	FG 2	Reason for Busy = No Reason	(Possible radio degradation by extreme heat)
[04/04/08 06:49:58]	Call Activity Update - PTT-ID Update	225054	FD WEST	Act/Busy Stat = Global Active	ENGINE 103: Engine 103's at the scene.
[04/04/08 06:50:01]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:50:01]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	
[04/04/08 06:50:01]	Mobility Update - Location Registration	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:50:03]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	
[04/04/08 06:50:03]	Radio Status Traffic - Subscriber Reject	242011	FG 11	#144, Stealth Reject	
[04/04/08 06:50:04]	Call Activity Update - Start of New Call	Broxterman	FG 2	Reason for Busy = No Reason	(Possible radio degradation by extreme heat)
[04/04/08 06:50:05]	Mobility Update - Group Affiliation	240XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:50:05]	Radio Status Traffic - Subscriber Reject	242011	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:50:06]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:50:06]	Call Activity Update - PTT-ID Update	Broxterman	FG 2	Act/Busy Stat = Global Active	(Possible radio degradation by extreme heat)
[04/04/08 06:50:07]	Call Activity Update - PTT-ID Update	225030	FG 11	Act/Busy Stat = Global Active	L25 ATO: Command from Ladder Exterior 25.
[04/04/08 06:50:08]	Radio Status Traffic - Subscriber Reject	225005	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:50:09]	Mobility Update - Group Affiliation	292XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:50:12]	Call Activity Update - PTT-ID Update	242011	FG 11	Act/Busy Stat = Global Active	L42: Ladder 42 on scene.
[04/04/08 06:50:12]	Call Activity Update - Start of New Call	Broxterman	FG 2	Reason for Busy = No Reason	(Possible radio degradation by extreme heat)
[04/04/08 06:50:13]	Radio Status Traffic - Subscriber Reject	225005	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:50:14]	Call Activity Update - PTT-ID Update	Broxterman	FG 2	Act/Busy Stat = Global Active	(Possible radio degradation by extreme heat)
[04/04/08 06:50:16]	Mobility Update - Group Affiliation	227014	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:50:16]	Mobility Update - Group Affiliation	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:50:16]	Mobility Update - Group Affiliation	407957	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:50:17]	Call Activity Update - Start of New Call	225081	FG 11	Reason for Busy = No Reason	Car 2514: 2512 and 2514 on the scene.
[04/04/08 06:50:19]	Mobility Update - Group Affiliation	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:50:21]	Mobility Update - Location Registration	225006	FG 2	Accepted	
[04/04/08 06:50:23]	Mobility Update - Group Affiliation	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:50:26]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Ladder 25 from Command, go ahead.
[04/04/08 06:50:29]	Mobility Update - Location Registration	225006	FG 2	Accepted	
[04/04/08 06:50:31]	Mobility Update - Group Affiliation	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:50:31]	Call Activity Update - PTT-ID Update	225030	FG 11	Act/Busy Stat = Global Active	L25 ATO: Ladder 25 Exterior, go ahead and charge the two-and-a-half. You've got an inch-and-three-quarter to the upper back deck.
[04/04/08 06:50:33]	Mobility Update - Location Registration	225006	FG 2	Accepted	
[04/04/08 06:50:35]	Mobility Update - Group Affiliation	242010	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:50:37]	Mobility Update - Location Registration	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:50:38]	Mobility Update - Group Affiliation	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:50:41]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Engine 102, did you copy? Charge the two-and-a-half.
[04/04/08 06:50:42]	Mobility Update - Location Registration	225006	FG 2	Accepted	

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:50:43]	Mobility Update - Group Affiliation	240XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:50:43]	Mobility Update - Group Affiliation	242010	FD WEST	Accepted	
[04/04/08 06:50:49]	Mobility Update - Group Affiliation	242010	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:50:50]	Mobility Update - Group Affiliation	225102	FG 2	Accepted	
[04/04/08 06:50:50]	Mobility Update - Group Affiliation	407957	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:50:51]	Mobility Update - Group Affiliation	225039	FG 2	Accepted	
[04/04/08 06:50:52]	Call Activity Update - Start of New Call	225030	FG 11	Reason for Busy = No Reason	
[04/04/08 06:50:55]	Radio Status Traffic - Subscriber Reject	242009	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:50:55]	Mobility Update - Group Affiliation	267XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:50:56]	Call Activity Update - PTT-ID Update	225098	FG 11	Act/Busy Stat = Global Active	
[04/04/08 06:50:57]	Radio Status Traffic - Subscriber Reject	242009	FG 11	#144, Stealth Reject	
[04/04/08 06:50:57]	Mobility Update - Group Affiliation	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:50:58]	Call Activity Update - Start of New Call	227014	FG 2	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 06:50:59]	Radio Status Traffic - Subscriber Reject	225088	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:51:01]	Radio Status Traffic - Subscriber Reject	225088	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:51:01]	Call Activity Update - PTT-ID Update	242009	FG 11	Act/Busy Stat = Global Active	RAT COMMAND: 4202 is on the scene.
[04/04/08 06:51:01]	Mobility Update - Group Affiliation	242010	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:51:02]	Call Activity Update - PTT-ID Update	225018	FG 2	Act/Busy Stat = Global Active	E25 OIC: RAT 25 is re-entering the building.
[04/04/08 06:51:04]	Mobility Update - Group Affiliation	240XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:51:05]	Mobility Update - Group Affiliation	407956	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:51:07]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Car 14 from Command
[04/04/08 06:51:07]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Okay. RAT 25, if the conditions are too terrible for you guys to make any effort, we're going to discontinue this operation. Do you copy?
[04/04/08 06:51:15]	Mobility Update - Group Affiliation	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:51:18]	Call Activity Update - PTT-ID Update	225018	FG 2	Act/Busy Stat = Global Active	
[04/04/08 06:51:20]	Mobility Update - Group Affiliation	240XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:51:24]	Mobility Update - Group Affiliation	267XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:51:25]	Call Activity Update - Start of New Call	4002	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:51:26]	Call Activity Update - Start of New Call	225088	FG 2	Reason for Busy = No Reason	D-25: RAT 25, did you copy?
[04/04/08 06:51:27]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Car 5 from Command.
[04/04/08 06:51:28]	Mobility Update - Group Affiliation	240XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:51:28]	Mobility Update - Group Affiliation	240XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:51:31]	Call Activity Update - PTT-ID Update	225018	FG 2	Act/Busy Stat = Global Active	E25 OIC: [Inaudible].
[04/04/08 06:51:33]	Mobility Update - Group Affiliation	225040	FG 11	Accepted	
[04/04/08 06:51:34]	Mobility Update - Group Affiliation	157XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:51:40]	Mobility Update - Location Registration	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:51:41]	Call Activity Update - Start of New Call	225030	FG 11	Reason for Busy = No Reason	L25 ATO: [Open microphone].
[04/04/08 06:51:41]	Call Activity Update - Start of New Call	225079	FG 2	Reason for Busy = No Reason	R26 OIC: RAT Command from Rescue 26.
[04/04/08 06:51:43]	Mobility Update - Location Registration	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:51:44]	Mobility Update - Group Affiliation	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:51:45]	Mobility Update - Group Affiliation	225006	FG 2	Accepted	
[04/04/08 06:51:45]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Unit calling RAT command go ahead.
[04/04/08 06:51:45]	Mobility Update - Group Affiliation	225503	FD WEST	Accepted	
[04/04/08 06:51:46]	Mobility Update - Group Affiliation	242010	FG 11	Accepted	
[04/04/08 06:51:47]	Mobility Update - Group Affiliation	225057	FG 11	Accepted	
[04/04/08 06:51:49]	Call Activity Update - PTT-ID Update	225079	FG 2	Act/Busy Stat = Global Active	R26 OIC: Rescue 26, be advised myself, [RAO], and [R26 FF] are now with Ladder 25's exterior crew doing fire attack from the exterior on the first floor.
[04/04/08 06:51:50]	Call Activity Update - Start of New Call	225082	FG 11	Reason for Busy = No Reason	TANKER 109: [Open microphone].

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:51:51]	Mobility Update - Group Affiliation	267XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:51:53]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Car 5 from Command.
[04/04/08 06:51:54]	Mobility Update - Group Affiliation	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:51:58]	Mobility Update - Group Affiliation	242026	FD WEST	Accepted	
[04/04/08 06:51:59]	Radio Status Traffic - Subscriber Reject	242026	FD WEST	#147, Talkgroup request was made on a regrouped Talkgroup	
[04/04/08 06:51:59]	Call Activity Update - Start of New Call	242026	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:52:00]	Mobility Update - Location Registration	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:52:02]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Engine 103 on scene.
[04/04/08 06:52:02]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Okay, that's clear.
[04/04/08 06:52:03]	Mobility Update - Location Registration	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:52:05]	Mobility Update - Group Affiliation	242032	FD WEST	Accepted	
[04/04/08 06:52:05]	Mobility Update - Group Affiliation	292XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:52:10]	Mobility Update - Location Registration	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:52:14]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:52:15]	Mobility Update - Group Affiliation	225034	FG 11	Accepted	
[04/04/08 06:52:18]	Call Activity Update - Start of New Call	8016	FG 11	Reason for Busy = No Reason	HCCC: Communications to fire ops command.
[04/04/08 06:52:19]	Mobility Update - Group Affiliation	256XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:52:20]	Mobility Update - Location Registration	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:52:20]	Mobility Update - Group Affiliation	242036	FD WEST	Accepted	
[04/04/08 06:52:22]	Call Activity Update - PTT-ID Update	225029	FG 11	Act/Busy Stat = Global Active	
[04/04/08 06:52:24]	Mobility Update - Group Affiliation	240XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:52:26]	Call Activity Update - Start of New Call	4002	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:52:26]	Mobility Update - Group Affiliation	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:52:29]	Mobility Update - Group Affiliation	206XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:52:31]	Call Activity Update - Start of New Call	225086	FG 11	Reason for Busy = No Reason	
[04/04/08 06:52:33]	Mobility Update - Group Affiliation	225096	FG 2	Accepted	
[04/04/08 06:52:34]	Mobility Update - Group Affiliation	266XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:52:35]	Call Activity Update - PTT-ID Update	242036	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:52:36]	Radio Status Traffic - Subscriber Reject	225008	FG 11	#144, Stealth Reject	
[04/04/08 06:52:36]	Radio Status Traffic - Subscriber Reject	225030	FG 11	#144, Stealth Reject	
[04/04/08 06:52:36]	Radio Status Traffic - Subscriber Reject	242032	FD WEST	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:52:36]	Call Activity Update - PTT-ID Update	264XXX	FG 11	Act/Busy Stat = Global Active	***NON-RESPONDING UNIT
[04/04/08 06:52:40]	Call Activity Update - Start of New Call	242032	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:52:42]	Mobility Update - Group Affiliation	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:52:43]	Call Activity Update - Start of New Call	8016	FG 11	Reason for Busy = No Reason	
[04/04/08 06:52:44]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:52:44]	Mobility Update - Group Affiliation	273XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:52:48]	Mobility Update - Group Affiliation	225518	FD WEST	Accepted	
[04/04/08 06:52:50]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command, go ahead.
[04/04/08 06:52:54]	Call Activity Update - PTT-ID Update	225008	FG 11	Act/Busy Stat = Global Active	Car 2506: Be advised, we need natural gas shut off. We have what looks like a natural gas fed fire. Also, accountability has been set up. We appear to be missing Engine 102's crew.
[04/04/08 06:52:56]	Call Activity Update - Start of New Call	242032	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:52:57]	Mobility Update - Group Affiliation	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:53:07]	Mobility Update - Group Affiliation	273XXX	FG 11	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:53:08]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: All right, copy that. We have one of the crew. Vadrnais is with Car 2512. He's taking care of him. The others, we did not know which ones those are. So you'll have to determine that.
[04/04/08 06:53:09]	Radio Status Traffic - Subscriber Reject	225007	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:53:09]	Radio Status Traffic - Subscriber Reject	242013	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:53:10]	Radio Status Traffic - Subscriber Reject	225030	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:53:10]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:53:14]	Mobility Update - Group Affiliation	242006	FD WEST	Accepted	
[04/04/08 06:53:22]	Call Activity Update - PTT-ID Update	225008	FG 11	Act/Busy Stat = Global Active	Car 2506: Okay. Do you want the names over the radio?
[04/04/08 06:53:24]	Mobility Update - Group Affiliation	206XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:53:26]	Radio Status Traffic - Subscriber Reject	225005	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:53:27]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Negative. RAT COMMAND is on his way down. Could you make sure he takes the -- he's going to do a walk around and check on condition of the building. Just point out anything from your location.
[04/04/08 06:53:41]	Call Activity Update - PTT-ID Update	225008	FG 11	Act/Busy Stat = Global Active	Car 2506: That's affirmative. I'm in the rear right now.
[04/04/08 06:53:45]	Call Activity Update - Start of New Call	227024	FD WEST	Reason for Busy = No Reason	ENGINE 28: Engine 28 on scene.
[04/04/08 06:53:48]	Mobility Update - Group Affiliation	206XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:53:49]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	HCCC: Engine 28 on scene, 6:53.
[04/04/08 06:53:50]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Command to all units, Command to all units on the scene, we need to make sure your crews are accountable and we need to assess the conditions in the building for safety. If it's not safe, we need to pull crews out. Command to Car 11.
[04/04/08 06:53:52]	Mobility Update - Group Affiliation	206XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:53:54]	Radio Status Traffic - Subscriber Reject	225081	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:53:54]	Mobility Update - Group Affiliation	225520	FG 2	Accepted	
[04/04/08 06:53:54]	Mobility Update - Location Registration	227024	FD WEST	Accepted	
[04/04/08 06:53:54]	Call Activity Update - PTT-ID Update	256XXX	FD WEST	Act/Busy Stat = Global Active	***NON-RESPONDING UNIT
[04/04/08 06:53:59]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:54:05]	Mobility Update - Group Affiliation	157XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:54:09]	Mobility Update - Group Affiliation	290XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:54:11]	Call Activity Update - Start of New Call	225088	FG 2	Reason for Busy = No Reason	
[04/04/08 06:54:14]	Call Activity Update - PTT-ID Update	225018	FG 2	Act/Busy Stat = Global Active	E25 OIC: RAT 25, go ahead.
[04/04/08 06:54:15]	Mobility Update - Group Affiliation	292XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:54:17]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: How is your progress?
[04/04/08 06:54:20]	Call Activity Update - PTT-ID Update	225018	FG 2	Act/Busy Stat = Global Active	E25 OIC: Be advised we're at the bottom of the interior stairwell and we have found the nozzle [inaudible] interior search of the basement. The crew may be on the first floor.
[04/04/08 06:54:20]	Mobility Update - Group Affiliation	225102	FG 2	Accepted	
[04/04/08 06:54:20]	Mobility Update - Group Affiliation	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:54:21]	Mobility Update - Group Affiliation	256XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:54:23]	Call Activity Update - Start of New Call	290XXX	FD WEST	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 06:54:24]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Car 14 from Command.
[04/04/08 06:54:25]	Mobility Update - Group Affiliation	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:54:27]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:54:28]	Call Activity Update - PTT-ID Update	225081	FG 11	Act/Busy Stat = Global Active	Car 2514: Go ahead, 14.
[04/04/08 06:54:31]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Okay, that's clear.
[04/04/08 06:54:32]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: 14, I need you to take front. We need to do an assessment on this fire to determine whether we need to have crews inside. We want quick fire knock down, but we have to do it from the outside if it's unsafe.
[04/04/08 06:54:33]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:54:36]	Call Activity Update - Start of New Call	225088	FG 2	Reason for Busy = No Reason	D-25: Keep aware of your surroundings. Bail if it gets untenable.
[04/04/08 06:54:39]	Mobility Update - Group Affiliation	262XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:54:45]	Call Activity Update - PTT-ID Update	225081	FG 11	Act/Busy Stat = Global Active	Car 2514: Car 14 on quick assessment, I'm just finishing my circle of the building and I'll let you know what I come up with.
[04/04/08 06:54:47]	Call Activity Update - Start of New Call	225018	FG 2	Reason for Busy = No Reason	E25 OIC: RAT 25 for Command, be advised we are making entry up the stairs. We'll keep you advised on the situation.
[04/04/08 06:54:52]	Radio Status Traffic - Subscriber Reject	225019	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:54:54]	Mobility Update - Group Affiliation	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:54:56]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: RAT 25, repeat that again.
[04/04/08 06:54:56]	Call Activity Update - PTT-ID Update	242009	FG 11	Act/Busy Stat = Global Active	RAT COMMAND: Command from 4202.
[04/04/08 06:54:58]	Radio Status Traffic - Subscriber Reject	225018	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:55:00]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Go ahead 4202.
[04/04/08 06:55:02]	Call Activity Update - PTT-ID Update	225018	FG 2	Act/Busy Stat = Global Active	E25 OIC: Unable to locate anyone on the lower [distortion] RAT 25 [distortion] stairwell [distortion].
[04/04/08 06:55:02]	Mobility Update - Group Affiliation	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:55:03]	Call Activity Update - PTT-ID Update	242009	FG 11	Act/Busy Stat = Global Active	RAT COMMAND: I'm in the rear of the structure. We need to get the gas shut off. The conditions are bearable. They're doing a good job. They're just knocking down the fire as they go.
[04/04/08 06:55:03]	Mobility Update - Group Affiliation	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:55:04]	Mobility Update - Group Affiliation	213XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:55:10]	Mobility Update - Group Affiliation	227019	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:55:10]	Mobility Update - Group Affiliation	407957	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:55:15]	Mobility Update - Group Affiliation	225520	FD WEST	Accepted	
[04/04/08 06:55:16]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Command to Engine 103.
[04/04/08 06:55:16]	Call Activity Update - Start of New Call	225518	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:55:16]	Mobility Update - Group Affiliation	286XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:55:17]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: That's clear.
[04/04/08 06:55:21]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:55:23]	Mobility Update - Group Affiliation	227019	FG 11	Accepted	
[04/04/08 06:55:24]	Radio Status Traffic - Subscriber Reject	225520	FD WEST	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:55:26]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:55:26]	Mobility Update - Group Affiliation	407957	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:55:27]	Call Activity Update - Start of New Call	225097	FG 11	Reason for Busy = No Reason	E103 OIC: Command from Engine 103, did you have traffic?
[04/04/08 06:55:27]	Mobility Update - Group Affiliation	286XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:55:28]	Radio Status Traffic - Subscriber Reject	225030	FG 11	#144, Stealth Reject	
[04/04/08 06:55:29]	Call Activity Update - Start of New Call	225019	FG 2	Reason for Busy = No Reason	E25 FAO: [Open microphone and indistinguishable conversation possibly between RAT 25 and Engine 26 crew.]

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:55:30]	Call Activity Update - PTT-ID Update	225019	FG 2	Act/Busy Stat = Global Active	
[04/04/08 06:55:31]	Call Activity Update - PTT-ID Update	225520	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:55:32]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Engine 103, see if you can locate the gas meter and shut off the gas, if possible. That's your assignment initially.
[04/04/08 06:55:32]	Mobility Update - Group Affiliation	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:55:36]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:55:36]	Mobility Update - Location Registration	258XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:55:41]	Call Activity Update - PTT-ID Update	225097	FG 11	Act/Busy Stat = Global Active	E103 OIC: That's clear.
[04/04/08 06:55:45]	Call Activity Update - PTT-ID Update	225030	FG 11	Act/Busy Stat = Global Active	L25 ATO: Command from Ladder 25 exterior.
[04/04/08 06:55:45]	Mobility Update - Group Affiliation	225034	FG 11	Accepted	
[04/04/08 06:55:46]	Call Activity Update - Start of New Call	225520	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:55:46]	Radio Status Traffic - Subscriber Reject	242032	FD WEST	#144, Stealth Reject	
[04/04/08 06:55:50]	Mobility Update - Group Affiliation	264XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:55:51]	Mobility Update - Group Affiliation	225505	FG 11	Accepted	
[04/04/08 06:55:51]	Mobility Update - Group Affiliation	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:55:51]	Call Activity Update - Start of New Call	242032	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:55:53]	Mobility Update - Group Affiliation	206XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:55:54]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:55:56]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:55:57]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Command, go ahead.
[04/04/08 06:56:00]	Mobility Update - Group Affiliation	225520	FG 11	Accepted	
[04/04/08 06:56:01]	Call Activity Update - PTT-ID Update	225030	FG 11	Act/Busy Stat = Global Active	L25 ATO: Gas has been shut off. It's on Side B, as in "boy." Gas has been shut off.
[04/04/08 06:56:02]	Radio Status Traffic - Subscriber Reject	225081	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:56:06]	Radio Status Traffic - Subscriber Reject	225082	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:56:06]	Mobility Update - Location Registration	227024	FD WEST	Accepted	
[04/04/08 06:56:06]	Mobility Update - Group Affiliation	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:56:08]	Mobility Update - Group Affiliation	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:56:10]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command to all units, the gas has been shut off by Ladder 25. Command to all units, the gas has been shut off
[04/04/08 06:56:13]	Mobility Update - Group Affiliation	286XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:56:15]	Mobility Update - Group Affiliation	286XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:56:16]	Mobility Update - Group Affiliation	278XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:56:20]	Mobility Update - Group Affiliation	206XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:56:20]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Squad 25 from Command.
[04/04/08 06:56:20]	Mobility Update - Group Affiliation	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:56:21]	Radio Status Traffic - Subscriber Reject	225097	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:56:23]	Call Activity Update - PTT-ID Update	225022	FG 11	Act/Busy Stat = Global Active	
[04/04/08 06:56:31]	Mobility Update - Group Affiliation	292XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:56:32]	Call Activity Update - PTT-ID Update	225019	FG 2	Act/Busy Stat = Global Active	
[04/04/08 06:56:40]	Call Activity Update - Start of New Call	225008	FG 11	Reason for Busy = No Reason	Car 2506: Command from accountability.
[04/04/08 06:56:42]	Mobility Update - Group Affiliation	268XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:56:42]	Mobility Update - Group Affiliation	292XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:56:44]	Mobility Update - Location Registration	227024	FD WEST	Accepted	
[04/04/08 06:56:45]	Call Activity Update - PTT-ID Update	225034	FG 11	Act/Busy Stat = Global Active	

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:56:49]	Mobility Update - Group Affiliation	256XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:56:53]	Call Activity Update - Start of New Call	225034	FG 11	Reason for Busy = No Reason	
[04/04/08 06:57:00]	Mobility Update - Group Affiliation	242040	FG 11	Accepted	
[04/04/08 06:57:01]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Command, go ahead.
[04/04/08 06:57:02]	Mobility Update - Group Affiliation	295XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:57:03]	Mobility Update - Location Registration	227024	FD WEST	Accepted	
[04/04/08 06:57:04]	Call Activity Update - PTT-ID Update	225008	FG 11	Act/Busy Stat = Global Active	Car 2506: Command from accountability, be advised that Engine accountability, be advised that Engine 102's crew was last seen going in the front door. Do we have permission to send a crew in, a RAT team, in the front door, to follow their line?
[04/04/08 06:57:05]	Radio Status Traffic - Subscriber Reject	225022	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 06:57:07]	Mobility Update - Group Affiliation	227018	FG 11	Accepted	
[04/04/08 06:57:07]	Mobility Update - Location Registration	227024	FD WEST	Accepted	
[04/04/08 06:57:11]	Radio Status Traffic - Subscriber Reject	225020	FG 2	#71, Individual not allowed to interrupt current audio source	***NON-RESPONDING UNIT
[04/04/08 06:57:12]	Mobility Update - Group Affiliation	286XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:57:15]	Mobility Update - Group Affiliation	295XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:57:17]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: You -- I need a front sector officer to okay that. I think Car 14 is down there. But make sure the front sector is okay with that and it's safe to do it. And let's not risk anybody else. Let's do what we have to do, but be safe.
[04/04/08 06:57:20]	Mobility Update - Group Affiliation	279XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:57:21]	Mobility Update - Group Affiliation	225036	FG 11	Accepted	
[04/04/08 06:57:22]	Radio Status Traffic - Subscriber Reject	225021	FG 2	#71, Individual not allowed to interrupt current audio source	***NON-RESPONDING UNIT
[04/04/08 06:57:23]	Mobility Update - Group Affiliation	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:57:26]	Call Activity Update - Start of New Call	242036	FD WEST	Reason for Busy = No Reason	
[04/04/08 06:57:27]	Mobility Update - Group Affiliation	225082	FG 11	Accepted	
[04/04/08 06:57:27]	Mobility Update - Group Affiliation	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:57:32]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:57:35]	Mobility Update - Group Affiliation	290XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:57:37]	Call Activity Update - PTT-ID Update	225008	FG 11	Act/Busy Stat = Global Active	Car 2506: Accountability is clear. Be advised I am with Car 14. He's going to assume front at this time.
[04/04/08 06:57:37]	Mobility Update - Group Affiliation	225034	FG 11	Accepted	SQ225: Squad 225 on-scene.
[04/04/08 06:57:37]	Mobility Update - Group Affiliation	295XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:57:41]	Mobility Update - Group Affiliation	225035	FD WEST	Accepted	
[04/04/08 06:57:43]	Mobility Update - Location Registration	227024	FD WEST	Accepted	
[04/04/08 06:57:45]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:57:46]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: Communications to accountability.
[04/04/08 06:57:47]	Mobility Update - Group Affiliation	225035	FG 11	Accepted	
[04/04/08 06:57:51]	Mobility Update - Group Affiliation	278XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:57:53]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:57:55]	Call Activity Update - Start of New Call	8016	FG 11	Reason for Busy = No Reason	HCCC: Communications to accountability.
[04/04/08 06:57:59]	Mobility Update - Location Registration	227024	FD WEST	Accepted	
[04/04/08 06:58:02]	Mobility Update - Group Affiliation	225039	FG 2	Accepted	
[04/04/08 06:58:03]	Call Activity Update - Start of New Call	8016	FG 11	Reason for Busy = No Reason	HCCC: Communications to Colerain Command.
[04/04/08 06:58:03]	Mobility Update - Location Registration	227024	FD WEST	Accepted	

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 06:59:21]	Mobility Update - Group Affiliation	225049	FD WEST	Accepted	
[04/04/08 06:59:22]	Mobility Update - Group Affiliation	225035	FG 2	Accepted	
[04/04/08 06:59:25]	Call Activity Update - Start of New Call	253XXX	FD WEST	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 06:59:25]	Mobility Update - Group Affiliation	258XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:59:26]	Mobility Update - Group Affiliation	227005	FG 11	Accepted	
[04/04/08 06:59:26]	Mobility Update - Group Affiliation	239XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:59:29]	Mobility Update - Group Affiliation	206XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:59:30]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:59:31]	Mobility Update - Group Affiliation	206XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:59:32]	Mobility Update - Group Affiliation	279XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:59:36]	Mobility Update - Group Affiliation	206XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:59:37]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Car 4202 from Command.
[04/04/08 06:59:39]	Mobility Update - Group Affiliation	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:59:40]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:59:41]	Call Activity Update - PTT-ID Update	242009	FG 11	Act/Busy Stat = Global Active	RAT COMMAND: Go ahead. We've got a good knock on this fire in the back, except for the second floor keeps flaring up a little bit. We got a crew inside. Conditions are pretty good.
[04/04/08 06:59:42]	Call Activity Update - Start of New Call	290XXX	FD WEST	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 06:59:45]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 06:59:49]	Mobility Update - Group Affiliation	253XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:59:51]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Okay 4202, I need you to command the overall RAT operations and the RAT team and switch to Channel 11.
[04/04/08 06:59:56]	Mobility Update - Group Affiliation	206XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 06:59:57]	Mobility Update - Group Affiliation	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:00:01]	Call Activity Update - PTT-ID Update	242009	FG 11	Act/Busy Stat = Global Active	RAT COMMAND: Do you want me to switch to 2 or do you want me to stay on
[04/04/08 07:00:03]	Mobility Update - Group Affiliation	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:00:05]	Radio Status Traffic - Subscriber Reject	225022	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:00:08]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Switch to Channel 2. You will work with the RAT command. I want you to organize the personnel and make sure that they're having direct oversight.
[04/04/08 07:00:10]	Mobility Update - Group Affiliation	225035	FG 11	Accepted	
[04/04/08 07:00:11]	Mobility Update - Group Affiliation	290XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:00:12]	Mobility Update - Group Affiliation	225048	FD WEST	Accepted	
[04/04/08 07:00:15]	Mobility Update - Group Affiliation	222XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:00:17]	Mobility Update - Group Affiliation	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:00:20]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:00:21]	Call Activity Update - PTT-ID Update	242009	FG 11	Act/Busy Stat = Global Active	RAT COMMAND: Okay, that's clear. Did RAT go in the front door?
[04/04/08 07:00:23]	Mobility Update - Group Affiliation	247XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:00:25]	Mobility Update - Group Affiliation	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:00:25]	Mobility Update - Group Affiliation	253XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:00:25]	Mobility Update - Group Affiliation	286XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:00:26]	Mobility Update - Group Affiliation	227001	FG 2	Accepted	
[04/04/08 07:00:27]	Call Activity Update - PTT-ID Update	225022	FG 11	Act/Busy Stat = Global Active	E26 OIC: Engine 26 just entered the building. We just encountered another crew coming up the stairs. They found a broken nozzle at the bottom of the stairs. We're going to go ahead and do a search of the basement.
[04/04/08 07:00:30]	Mobility Update - Group Affiliation	225057	FG 2	Accepted	

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:00:30]	Mobility Update - Location Registration	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:00:37]	Mobility Update - Group Affiliation	403001	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:00:41]	Mobility Update - Group Affiliation	242009	FG 2	Accepted	
[04/04/08 07:00:42]	Mobility Update - Group Affiliation	225057	FG 11	Accepted	
[04/04/08 07:00:43]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Engine 26, copy. Keep feeding the information on the conditions in the building.
[04/04/08 07:00:45]	Radio Status Traffic - Subscriber Reject	225505	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:00:46]	Mobility Update - Group Affiliation	225041	FD WEST	Accepted	
[04/04/08 07:00:47]	Radio Status Traffic - Subscriber Reject	258XXX	FG 11	#71, Individual not allowed to interrupt current audio source	***NON-RESPONDING UNIT
[04/04/08 07:00:50]	Call Activity Update - PTT-ID Update	225022	FG 11	Act/Busy Stat = Global Active	E26 OIC: Engine 26 is clear. Being extremely cautious with building conditions.
[04/04/08 07:00:52]	Mobility Update - Group Affiliation	225041	FG 2	Accepted	
[04/04/08 07:00:52]	Mobility Update - Group Affiliation	286XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:00:55]	Mobility Update - Group Affiliation	278XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:00:58]	Mobility Update - Group Affiliation	286XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:00:59]	Mobility Update - Group Affiliation	279XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:00]	Mobility Update - Group Affiliation	258XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:00]	Mobility Update - Group Affiliation	278XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:01]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Engine 26, repeat the conditions again.
[04/04/08 07:01:05]	Mobility Update - Group Affiliation	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:06]	Mobility Update - Group Affiliation	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:07]	Call Activity Update - PTT-ID Update	225022	FG 11	Act/Busy Stat = Global Active	E26 OIC: Engine 26, I'm aware of the building conditions. I am being extremely cautious with my crew and the building conditions.
[04/04/08 07:01:08]	Mobility Update - Group Affiliation	258XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:09]	Mobility Update - Group Affiliation	253XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:09]	Mobility Update - Group Affiliation	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:10]	Mobility Update - Group Affiliation	225018	FG 11	Accepted	
[04/04/08 07:01:11]	Mobility Update - Group Affiliation	242026	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:14]	Mobility Update - Group Affiliation	242004	FD WEST	Accepted	
[04/04/08 07:01:14]	Mobility Update - Group Affiliation	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:15]	Mobility Update - Group Affiliation	225102	FG 2	Accepted	
[04/04/08 07:01:15]	Mobility Update - Group Affiliation	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:16]	Radio Status Traffic - Subscriber Reject	279XXX	FG 11	#71, Individual not allowed to interrupt current audio source	***NON-RESPONDING UNIT
[04/04/08 07:01:17]	Mobility Update - Group Affiliation	213XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:17]	Mobility Update - Group Affiliation	225048	FG 11	Accepted	
[04/04/08 07:01:17]	Call Activity Update - Start of New Call	242036	FD WEST	Reason for Busy = No Reason	
[04/04/08 07:01:18]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command is clear.
[04/04/08 07:01:20]	Mobility Update - Location Registration	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:20]	Mobility Update - Group Affiliation	239XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:20]	Mobility Update - Group Affiliation	290XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:21]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:01:21]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:01:22]	Call Activity Update - Start of New Call	225018	FG 2	Reason for Busy = No Reason	
[04/04/08 07:01:23]	Call Activity Update - Start of New Call	8016	FG 11	Reason for Busy = No Reason	HCCC: Colerain Township Command, priority traffic.
[04/04/08 07:01:23]	Mobility Update - Group Affiliation	266XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:31]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Colerain Command, go.
[04/04/08 07:01:32]	Mobility Update - Group Affiliation	253XXX	FG 2	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:01:32]	Mobility Update - Group Affiliation	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:32]	Mobility Update - Location Registration	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:33]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: Dispatching your stations to Hidden Meadows for a structure fire. Information?
[04/04/08 07:01:43]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Okay. Our units are probably all tied up over here. In any case, would you pass that call off to Springfield Township, and make sure you send enough equipment for the initial.
[04/04/08 07:01:44]	Mobility Update - Group Affiliation	227004	FG 2	Accepted	
[04/04/08 07:01:45]	Mobility Update - Group Affiliation	225031	FD WEST	Accepted	
[04/04/08 07:01:49]	Mobility Update - Group Affiliation	225501	FD WEST	Accepted	
[04/04/08 07:01:50]	Mobility Update - Group Affiliation	227004	FG 11	Accepted	
[04/04/08 07:01:50]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:50]	Call Activity Update - Start of New Call	242009	FG 2	Reason for Busy = No Reason	RAT COMMAND: RAT Command, this is 4202. Go ahead.
[04/04/08 07:01:51]	Mobility Update - Group Affiliation	286XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:54]	Mobility Update - Group Affiliation	227008	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:55]	Mobility Update - Group Affiliation	206XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:01:58]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: 4202, can you just give me an update on what they have currently?
[04/04/08 07:01:59]	Mobility Update - Group Affiliation	242002	FD WEST	Accepted	
[04/04/08 07:02:01]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: Okay, that's clear. Squad 226 Rescue and Quint 48, Fairfield engine, Fire Ground 4, Engine 75, 74, 48, information only. We'll go ahead and have Springfield Township take command of that.
[04/04/08 07:02:03]	Mobility Update - Group Affiliation	225031	FG 11	Accepted	
[04/04/08 07:02:03]	Mobility Update - Group Affiliation	239XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:02:04]	Call Activity Update - Start of New Call	8016	FG 11	Reason for Busy = No Reason	
[04/04/08 07:02:05]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	RAT COMMAND: Okay. I don't know yet. Give me a minute here. RAT Command to interior RAT.
[04/04/08 07:02:08]	Mobility Update - Group Affiliation	242006	FD WEST	Accepted	
[04/04/08 07:02:08]	Mobility Update - Group Affiliation	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:02:10]	Mobility Update - Group Affiliation	290XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:02:21]	Call Activity Update - Start of New Call	225018	FG 2	Reason for Busy = No Reason	E25 OIC: RAT 25 to Command, RAT 25 is exiting the structure.
[04/04/08 07:02:22]	Mobility Update - Group Affiliation	268XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:02:24]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Command to Engine 109.
[04/04/08 07:02:25]	Call Activity Update - Start of New Call	4002	FD WEST	Reason for Busy = No Reason	
[04/04/08 07:02:26]	Mobility Update - Group Affiliation	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:02:27]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	RAT COMMAND: Okay, I copy somebody exiting the structure. Do you have anybody with you?
[04/04/08 07:02:29]	Mobility Update - Group Affiliation	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:02:33]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:02:34]	Mobility Update - Group Affiliation	253XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:02:38]	Mobility Update - Location Registration	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:02:38]	Mobility Update - Group Affiliation	253XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:02:39]	Mobility Update - Group Affiliation	225003	FG 11	Accepted	
[04/04/08 07:02:39]	Call Activity Update - Start of New Call	225084	FG 11	Reason for Busy = No Reason	E109 OIC: Engine 109, go ahead.
[04/04/08 07:02:41]	Radio Status Traffic - Subscriber Reject	225027	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:02:41]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:02:41]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:02:42]	Mobility Update - Group Affiliation	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:02:43]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: What's your assignment, Engine 109?

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:02:43]	Radio Status Traffic - Subscriber Reject	242049	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:02:47]	Call Activity Update - PTT-ID Update	225084	FG 11	Act/Busy Stat = Global Active	E109 OIC: Rear sector.
[04/04/08 07:02:48]	Mobility Update - Group Affiliation	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:02:48]	Mobility Update - Group Affiliation	242002	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:02:48]	Mobility Update - Group Affiliation	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:02:49]	Call Activity Update - Start of New Call	242002	FG 2	Reason for Busy = No Reason	
[04/04/08 07:02:51]	Mobility Update - Group Affiliation	286XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:02:52]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Clear. Command to Engine 25.
[04/04/08 07:02:55]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:02:59]	Mobility Update - Group Affiliation	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:02:59]	Mobility Update - Location Registration	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:03:02]	Mobility Update - Group Affiliation	239XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:03:06]	Call Activity Update - Start of New Call	242009	FG 2	Reason for Busy = No Reason	RAT COMMAND: RAT Operations to command.
[04/04/08 07:03:06]	Mobility Update - Group Affiliation	248XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:03:08]	Mobility Update - Location Registration	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:03:11]	Mobility Update - Group Affiliation	225068	FD WEST	Accepted	
[04/04/08 07:03:12]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Go ahead.
[04/04/08 07:03:14]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	
[04/04/08 07:03:15]	Mobility Update - Group Affiliation	253XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:03:15]	Mobility Update - Location Registration	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:03:16]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	RAT COMMAND: Okay, I know we got ladders up. I don't know exactly who's inside yet. I'm still trying to determine that.
[04/04/08 07:03:18]	Call Activity Update - Start of New Call	242036	FD WEST	Reason for Busy = No Reason	
[04/04/08 07:03:19]	Mobility Update - Group Affiliation	297XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:03:20]	Mobility Update - Group Affiliation	253XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:03:22]	Call Activity Update - PTT-ID Update	279XXX	FD WEST	Act/Busy Stat = Global Active	***NON-RESPONDING UNIT
[04/04/08 07:03:24]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Okay. Do we have an additional RAT backup crew at this time?
[04/04/08 07:03:24]	Mobility Update - Group Affiliation	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:03:25]	Mobility Update - Group Affiliation	225044	FD WEST	Accepted	
[04/04/08 07:03:25]	Call Activity Update - Start of New Call	242013	FG 11	Reason for Busy = No Reason	
[04/04/08 07:03:26]	Call Activity Update - PTT-ID Update	242013	FG 11	Act/Busy Stat = Global Active	
[04/04/08 07:03:28]	Call Activity Update - Start of New Call	225068	FD WEST	Reason for Busy = No Reason	
[04/04/08 07:03:29]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:03:31]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:03:31]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	RAT COMMAND: I have two guys I can assign to that.
[04/04/08 07:03:32]	Call Activity Update - PTT-ID Update	225022	FG 11	Act/Busy Stat = Global Active	E26 OIC: Command from Engine 26.
[04/04/08 07:03:33]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:03:35]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Okay. I want to make sure that we got additional people available. And let's get a report from the original RAT crew and get an update and see where we're at.
[04/04/08 07:03:35]	Mobility Update - Group Affiliation	258XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:03:36]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command, go ahead.
[04/04/08 07:03:39]	Call Activity Update - PTT-ID Update	225022	FG 11	Act/Busy Stat = Global Active	E26 OIC: We're going to need a line on this first floor. I'm getting a flare-up, and I'm not going to let that fire get behind me.
[04/04/08 07:03:40]	Mobility Update - Group Affiliation	256XXX	FD WEST	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:03:44]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	RAT COMMAND: Okay, I've got an engine 103 crew ready to go right here. I've got a full four-person crew I can send in if you want.
[04/04/08 07:03:48]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: If you need to, you back out until you have an additional line in there. We'll get somebody working on that.
[04/04/08 07:03:48]	Mobility Update - Group Affiliation	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:03:52]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Well, I just want them there as a backup to the crews that are going on. Remember, our primary objective here is to find those down firefighters.
[04/04/08 07:03:53]	Mobility Update - Group Affiliation	225067	FD WEST	Accepted	
[04/04/08 07:03:53]	Mobility Update - Group Affiliation	242005	FD WEST	Accepted	
[04/04/08 07:03:56]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:03:56]	Call Activity Update - PTT-ID Update	225022	FG 11	Act/Busy Stat = Global Active	E26 OIC: Okay, that's clear.
[04/04/08 07:03:57]	Radio Status Traffic - Subscriber Reject	225081	FG 11	#144, Stealth Reject	
[04/04/08 07:03:57]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:03:57]	Mobility Update - Group Affiliation	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:03:57]	Mobility Update - Group Affiliation	290XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:04:00]	Call Activity Update - PTT-ID Update	225081	FG 11	Act/Busy Stat = Global Active	Car 2514: Command, this is Car 14. I have Engine 103 with a full crew that I can assign and I've got the front sector.
[04/04/08 07:04:00]	Mobility Update - Group Affiliation	268XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:04:01]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	RAT COMMAND: I got you. RAT operations to the interior.
[04/04/08 07:04:01]	Mobility Update - Group Affiliation	242031	FD WEST	Accepted	
[04/04/08 07:04:05]	Mobility Update - Group Affiliation	278XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:04:11]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Front, go ahead and handle that. Again, safety is priority.
[04/04/08 07:04:11]	Mobility Update - Group Affiliation	225035	FD WEST	Accepted	
[04/04/08 07:04:11]	Mobility Update - Group Affiliation	227019	FG 11	Accepted	
[04/04/08 07:04:11]	Mobility Update - Group Affiliation	240XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:04:11]	Call Activity Update - PTT-ID Update	279XXX	FG WEST	Act/Busy Stat = Global Active	***NON-RESPONDING UNIT
[04/04/08 07:04:14]	Mobility Update - Location Registration	279XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:04:16]	Call Activity Update - Start of New Call	8007	FG 2	Reason for Busy = No Reason	
[04/04/08 07:04:16]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: Communications to command.
[04/04/08 07:04:16]	Radio Status Traffic - Start Group Regrouping		FG 2		
[04/04/08 07:04:17]	Radio Status Traffic - End Group Regrouping		FG 2		
[04/04/08 07:04:18]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: Communications to Command, Fire Ground 11.
[04/04/08 07:04:18]	Mobility Update - Location Registration	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:04:21]	Call Activity Update - Start of New Call	242009	FG 2	Reason for Busy = No Reason	RAT COMMAND: RAT operations to interior.
[04/04/08 07:04:24]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:04:25]	Mobility Update - Group Affiliation	242003	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:04:26]	Mobility Update - Group Affiliation	268XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:04:29]	Call Activity Update - Start of New Call	225068	FD WEST	Reason for Busy = No Reason	
[04/04/08 07:04:30]	Mobility Update - Group Affiliation	278XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:04:31]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	
[04/04/08 07:04:31]	Call Activity Update - Start of New Call	225009	FG 11	Reason for Busy = No Reason	
[04/04/08 07:04:31]	Mobility Update - Group Affiliation	225521	FD WEST	Accepted	
[04/04/08 07:04:31]	Mobility Update - Group Affiliation	290XXX	FG 11	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:04:32]	Radio Status Traffic - Subscriber Reject	225007	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:04:32]	Mobility Update - Group Affiliation	225037	FG 2	Accepted	
[04/04/08 07:04:33]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:04:33]	Mobility Update - Group Affiliation	227008	FG 2	Accepted	
[04/04/08 07:04:34]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command, go ahead.
[04/04/08 07:04:35]	Call Activity Update - Start of New Call	225088	FG 2	Reason for Busy = No Reason	D-25: RAT operations we assigned them RAT 25 initially.
[04/04/08 07:04:36]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: Information: Air Rescue 91 is not available to fly, but they can send a ground crew if you'd like them to start that way.
[04/04/08 07:04:38]	Mobility Update - Group Affiliation	227008	FG 2	Accepted	
[04/04/08 07:04:39]	Mobility Update - Group Affiliation	274XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:04:40]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	RAT COMMAND: Okay, that's clear. RAT 25, RAT 25.
[04/04/08 07:04:41]	Radio Status Traffic - Subscriber Reject	225044	FD WEST	#144, Stealth Reject	
[04/04/08 07:04:41]	Call Activity Update - PTT-ID Update	225068	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:04:43]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:04:44]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Negative. Not at this time. We'll advise if we need that.
[04/04/08 07:04:46]	Mobility Update - Group Affiliation	248XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:04:48]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: Okay.
[04/04/08 07:04:49]	Call Activity Update - PTT-ID Update	225044	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:04:52]	Call Activity Update - PTT-ID Update	225007	FG 11	Act/Busy Stat = Global Active	Car 2508: Command from rear.
[04/04/08 07:04:54]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:04:57]	Mobility Update - Location Registration	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:04:57]	Mobility Update - Location Registration	240XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:04:57]	Mobility Update - Location Registration	283XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:05:01]	Call Activity Update - Start of New Call	274XXX	FD WEST	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 07:05:01]	Mobility Update - Location Registration	279XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:05:06]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:05:09]	Call Activity Update - PTT-ID Update	274XXX	FD WEST	Act/Busy Stat = Global Active	***NON-RESPONDING UNIT
[04/04/08 07:05:13]	Mobility Update - Group Affiliation	225057	FG 2	Accepted	
[04/04/08 07:05:13]	Call Activity Update - Start of New Call	242013	FG 11	Reason for Busy = No Reason	
[04/04/08 07:05:15]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:05:18]	Call Activity Update - Start of New Call	225520	FG 11	Reason for Busy = No Reason	
[04/04/08 07:05:21]	Call Activity Update - PTT-ID Update	225520	FG 11	Act/Busy Stat = Global Active	
[04/04/08 07:05:24]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command to rear, go ahead.
[04/04/08 07:05:28]	Call Activity Update - PTT-ID Update	225007	FG 11	Act/Busy Stat = Global Active	Car 2508: I got a crew coming back out. Their theory is there's a portion of the floor, first floor, into the basement, Beta/Charlie corner, that's collapsed. Like perhaps they were on the first floor and fell into the basement, in the Beta/Charlie corner, and the floor collapsed on them. They're possible there in the Beta/Charlie corner.
[04/04/08 07:05:29]	Radio Status Traffic - Subscriber Reject	225520	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:05:30]	Mobility Update - Location Registration	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:05:30]	Mobility Update - Group Affiliation	248XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:05:30]	Radio Status Traffic - Subscriber Reject	248XXX	FD WEST	#147, Talkgroup request was made on a regrouped Talkgroup	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:05:31]	Radio Status Traffic - Subscriber Reject	225520	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:05:31]	Radio Status Traffic - Subscriber Reject	225520	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:05:31]	Call Activity Update - Start of New Call	248XXX	FD WEST	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 07:05:34]	Call Activity Update - Start of New Call	225088	FG 2	Reason for Busy = No Reason	
[04/04/08 07:05:34]	Call Activity Update - PTT-ID Update	248XXX	FD WEST	Act/Busy Stat = Global Active	***NON-RESPONDING UNIT
[04/04/08 07:05:35]	Mobility Update - Group Affiliation	292XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:05:36]	Radio Status Traffic - Subscriber Reject	225008	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:05:37]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:05:41]	Mobility Update - Location Registration	240XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:05:41]	Call Activity Update - PTT-ID Update	242036	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:05:41]	Mobility Update - Group Affiliation	248XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:05:42]	Mobility Update - Group Affiliation	225057	FG 11	Accepted	
[04/04/08 07:05:43]	Mobility Update - Group Affiliation	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:05:43]	Mobility Update - Group Affiliation	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:05:45]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:05:46]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:05:46]	Radio Status Traffic - Subscriber Reject	242013	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:05:50]	Mobility Update - Group Affiliation	268XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:05:54]	Mobility Update - Group Affiliation	225501	FG 11	Accepted	
[04/04/08 07:05:56]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Copy that. We need to keep a tight handle on this, on what we can continue to do to get this fire extinguished, so we can move forward. So I need constant feedback on that.
[04/04/08 07:05:56]	Mobility Update - Group Affiliation	225521	FG 2	Accepted	
[04/04/08 07:06:01]	Mobility Update - Group Affiliation	225521	FD WEST	Accepted	
[04/04/08 07:06:01]	Radio Status Traffic - Subscriber Reject	242013	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:06:02]	Mobility Update - Group Affiliation	225041	FG 2	Accepted	
[04/04/08 07:06:08]	Mobility Update - Group Affiliation	225520	FD WEST	Accepted	
[04/04/08 07:06:09]	Radio Status Traffic - Subscriber Reject	242013	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:06:10]	Mobility Update - Group Affiliation	240XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:06:10]	Mobility Update - Group Affiliation	240XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:06:13]	Call Activity Update - Start of New Call	225520	FD WEST	Reason for Busy = No Reason	
[04/04/08 07:06:15]	Call Activity Update - PTT-ID Update	225007	FG 11	Act/Busy Stat = Global Active	Car 2508: That's clear.
[04/04/08 07:06:17]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:06:17]	Radio Status Traffic - Subscriber Reject	227031	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:06:21]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:06:21]	Mobility Update - Group Affiliation	225041	FG 11	Accepted	
[04/04/08 07:06:22]	Mobility Update - Group Affiliation	213XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:06:23]	Call Activity Update - Start of New Call	242013	FG 11	Reason for Busy = No Reason	
[04/04/08 07:06:25]	Mobility Update - Group Affiliation	278XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:06:28]	Mobility Update - Group Affiliation	225027	FD WEST	Accepted	
[04/04/08 07:06:28]	Mobility Update - Group Affiliation	268XXX	FG 11	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:06:30]	Call Activity Update - Start of New Call	242009	FG 2	Reason for Busy = No Reason	RAT COMMAND: RAT operations to command.
[04/04/08 07:06:33]	Mobility Update - Group Affiliation	225031	FD WEST	Accepted	
[04/04/08 07:06:35]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Rear sector from Command.
[04/04/08 07:06:35]	Mobility Update - Group Affiliation	225006	FG 2	Accepted	
[04/04/08 07:06:35]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Go ahead.
[04/04/08 07:06:37]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	RAT COMMAND: I haven't heard from that interior RAT 25 yet. I have Ross Township as my backup RAT, ready to go when they're ready.
[04/04/08 07:06:39]	Radio Status Traffic - Subscriber Reject	225022	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:06:39]	Mobility Update - Group Affiliation	225031	FG 2	Accepted	
[04/04/08 07:06:39]	Mobility Update - Group Affiliation	225518	FG 11	Accepted	
[04/04/08 07:06:39]	Mobility Update - Group Affiliation	248XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:06:43]	Call Activity Update - PTT-ID Update	279XXX	FD WEST	Act/Busy Stat = Global Active	***NON-RESPONDING UNIT
[04/04/08 07:06:46]	Call Activity Update - Start of New Call	225518	FG 11	Reason for Busy = No Reason	
[04/04/08 07:06:47]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Okay. Stand by.
[04/04/08 07:06:47]	Call Activity Update - PTT-ID Update	225518	FG 11	Act/Busy Stat = Global Active	
[04/04/08 07:06:48]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:06:53]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:06:55]	Call Activity Update - Start of New Call	225027	FD WEST	Reason for Busy = No Reason	
[04/04/08 07:06:56]	Call Activity Update - Start of New Call	225088	FG 2	Reason for Busy = No Reason	D-25: RAT operations, we're going to go defensive. We're going to re-do this whole operation so we can get a handle on who we've got to -- who do we got missing and who we don't.
[04/04/08 07:06:56]	Mobility Update - Group Affiliation	286XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:06:57]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Command to all units on the scene, we're going to go defensive. All units on the scene, we're going to go defensive. Let's pull all crews out of the building immediately.
[04/04/08 07:06:58]	Mobility Update - Group Affiliation	240XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:06:58]	Mobility Update - Group Affiliation	296XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:07:03]	Call Activity Update - Start of New Call	4002	FD WEST	Reason for Busy = No Reason	
[04/04/08 07:07:06]	Mobility Update - Group Affiliation	242031	FG 11	Accepted	
[04/04/08 07:07:08]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	RAT COMMAND: Okay. From the A side of the structure, the fire looks down.
[04/04/08 07:07:09]	Call Activity Update - Start of New Call	4002	FD WEST	Reason for Busy = No Reason	
[04/04/08 07:07:09]	Mobility Update - Group Affiliation	225503	FD WEST	Accepted	
[04/04/08 07:07:12]	Mobility Update - Group Affiliation	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:07:13]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Okay. Now I don't have accountability of this RAT 25. So we're going to go a defensive mode and we're going to regroup. So we're going to be doing this change here.
[04/04/08 07:07:13]	Mobility Update - Group Affiliation	248XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:07:15]	Call Activity Update - Start of New Call	8016	FG 11	Reason for Busy = No Reason	[ALERT TONE].HCCC: Attention all fire units, all fire units, per Command, now a defensive operation. Repeating: Attention all fire units on Squirrelsnest Lane, this is now, this fire is now a defensive operation. All crews evacuate the building immediately.
[04/04/08 07:07:16]	Mobility Update - Group Affiliation	273XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:07:17]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	
[04/04/08 07:07:17]	Mobility Update - Group Affiliation	248XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:07:18]	Mobility Update - Group Affiliation	225005	FD WEST	Accepted	
[04/04/08 07:07:18]	Call Activity Update - Start of New Call	225005	FD WEST	Reason for Busy = No Reason	

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### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:07:23]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	RAT COMMAND: Okay, that's clear.
[04/04/08 07:07:24]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:07:24]	<b>Radio Status Traffic - Subscriber Reject</b>	225018	FG 2	#71, Individual not allowed to interrupt current audio source	E25 OIC: RAT 25 Command, our crew is out of the structure and clear of the building.
[04/04/08 07:07:26]	Call Activity Update - PTT-ID Update	225018	FG 2	Act/Busy Stat = Global Active	
[04/04/08 07:07:27]	Call Activity Update - PTT-ID Update	225005	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:07:27]	Mobility Update - Group Affiliation	225027	FG 11	Accepted	
[04/04/08 07:07:31]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	RAT COMMAND: How about your search, RAT 25, did you find anything?
[04/04/08 07:07:34]	<b>Call Activity Update - Start of New Call</b>	225029	FG 11	Reason for Busy = No Reason	L25 OIC: Command from Ladder 25, Engine 26 crew out.
[04/04/08 07:07:38]	<b>Call Activity Update - Start of New Call</b>	225018	FG 2	Reason for Busy = No Reason	E25 OIC: Initial report as stated, the fire line was found at the bottom of the steps, the nozzle is at the steps. We found nothing on the basement floor. Crews did make entry up steps, where we encountered Engine 26, they were continuing to search first floor.
[04/04/08 07:07:38]	Mobility Update - Group Affiliation	225514	FD WEST	Accepted	
[04/04/08 07:07:39]	Mobility Update - Group Affiliation	248XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:07:41]	Mobility Update - Group Affiliation	225521	FG 11	Accepted	
[04/04/08 07:07:41]	Mobility Update - Group Affiliation	279XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:07:42]	<b>Call Activity Update - Start of New Call</b>	4002	FD WEST	Reason for Busy = No Reason	
[04/04/08 07:07:42]	Mobility Update - Group Affiliation	225005	FG 11	Accepted	
[04/04/08 07:07:42]	Mobility Update - Group Affiliation	225079	FG 11	Accepted	
[04/04/08 07:07:44]	Mobility Update - Group Affiliation	242005	FG 11	Accepted	
[04/04/08 07:07:44]	Mobility Update - Group Affiliation	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:07:45]	Mobility Update - Group Affiliation	225514	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:07:50]	Mobility Update - Group Affiliation	278XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:07:52]	Mobility Update - Location Registration	240XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:07:54]	Mobility Update - Location Registration	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:07:58]	<b>Radio Status Traffic - Subscriber Reject</b>	225007	FG 11	#144, Stealth Reject	
[04/04/08 07:07:58]	<b>Call Activity Update - Start of New Call</b>	242009	FG 2	Reason for Busy = No Reason	RAT COMMAND: Okay, that's clear.
[04/04/08 07:07:58]	<b>Call Activity Update - Start of New Call</b>	242013	FG 11	Reason for Busy = No Reason	
[04/04/08 07:07:59]	<b>Call Activity Update - Start of New Call</b>	278XXX	FD WEST	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 07:08:00]	<b>Radio Status Traffic - Subscriber Reject</b>	225503	FD WEST	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:08:01]	<b>Radio Status Traffic - Subscriber Reject</b>	225029	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:08:01]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	RAT COMMAND: RAT ops to Command, are you clear on that?
[04/04/08 07:08:02]	Call Activity Update - PTT-ID Update	225007	FG 11	Act/Busy Stat = Global Active	Car 2508: Command from rear.
[04/04/08 07:08:03]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:08:03]	<b>Radio Status Traffic - Subscriber Reject</b>	225005	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:08:03]	Mobility Update - Group Affiliation	290XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:08:05]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Rear, go ahead.
[04/04/08 07:08:05]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Negative, repeat.
[04/04/08 07:08:08]	Call Activity Update - PTT-ID Update	225007	FG 11	Act/Busy Stat = Global Active	Car 2508: I have a crew that is quickly checking under some debris here on the first floor, Charlie side.

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:08:08]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	RAT COMMAND: Okay. RAT 25 did an interior search of the basement, found the end of the hose, did not find anybody. Went to the upper floor and Engine 26 was up there, and they haven't found anybody yet neither. I guess we need to find out where our crew is.
[04/04/08 07:08:08]	Mobility Update - Group Affiliation	247XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:08:09]	Call Activity Update - PTT-ID Update	225503	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:08:10]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:08:10]	Mobility Update - Group Affiliation	248XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:08:15]	Mobility Update - Group Affiliation	206XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:08:16]	Call Activity Update - Start of New Call	4002	FD WEST	Reason for Busy = No Reason	
[04/04/08 07:08:19]	Call Activity Update - PTT-ID Update	225007	FG 11	Act/Busy Stat = Global Active	Car 2508: Command from rear, we have located a firefighter.
[04/04/08 07:08:20]	Radio Status Traffic - Subscriber Reject	225005	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:08:20]	Radio Status Traffic - Subscriber Reject	225022	FG 11	#144, Stealth Reject	
[04/04/08 07:08:21]	Radio Status Traffic - Subscriber Reject	225022	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:08:21]	Mobility Update - Group Affiliation	225514	FD WEST	Accepted	
[04/04/08 07:08:22]	Radio Status Traffic - Subscriber Reject	225005	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:08:23]	Radio Status Traffic - Subscriber Reject	225088	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:08:24]	Radio Status Traffic - Subscriber Reject	225022	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:08:24]	Mobility Update - Group Affiliation	290XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:08:25]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Okay, that's clear. We're ceasing operations here until we get a handle on accountability, and then we'll resume.
[04/04/08 07:08:26]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Clear on the location. I want to make sure that we're not operating under conditions that are unsafe. So you monitor that closely. We want to pull out people in the other sectors if at all possible.
[04/04/08 07:08:26]	Radio Status Traffic - Subscriber Reject	225022	FG 11	#144, Stealth Reject	
[04/04/08 07:08:27]	Radio Status Traffic - Subscriber Reject	225022	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:08:33]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	RAT COMMAND: Okay, that's clear.
[04/04/08 07:08:33]	Mobility Update - Group Affiliation	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:08:37]	Mobility Update - Location Registration	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:08:39]	Radio Status Traffic - Subscriber Reject	225022	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:08:39]	Radio Status Traffic - Subscriber Reject	225025	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:08:41]	Call Activity Update - Start of New Call	248XXX	FD WEST	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 07:08:45]	Call Activity Update - PTT-ID Update	225008	FG 11	Act/Busy Stat = Global Active	Car 2506: Command from accountability, emergency traffic.
[04/04/08 07:08:47]	Mobility Update - Group Affiliation	242045	FD WEST	Accepted	
[04/04/08 07:08:50]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Go ahead, accountability.
[04/04/08 07:08:51]	Radio Status Traffic - Subscriber Reject	225022	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:08:51]	Call Activity Update - Start of New Call	242009	FG 2	Reason for Busy = No Reason	RAT COMMAND: RAT operations to Engine 26, give me an update.
[04/04/08 07:08:52]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:08:52]	Call Activity Update - PTT-ID Update	225081	FG 11	Act/Busy Stat = Global Active	
[04/04/08 07:08:53]	Radio Status Traffic - Subscriber Reject	225008	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:08:55]	Radio Status Traffic - Subscriber Reject	242013	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:08:56]	Radio Status Traffic - Subscriber Reject	225008	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:08:57]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Go ahead, accountability.
[04/04/08 07:08:57]	Radio Status Traffic - Subscriber Reject	242013	FG 11	#144, Stealth Reject	
[04/04/08 07:08:59]	Mobility Update - Group Affiliation	225506	FD WEST	Accepted	
[04/04/08 07:09:00]	Call Activity Update - PTT-ID Update	225008	FG 11	Act/Busy Stat = Global Active	Car 2506: Accountability, be advised we have found a firefighter in the basement. We need EMS to the rear of the structure and also additional firefighters to the rear the structure.
[04/04/08 07:09:02]	Mobility Update - Group Affiliation	407807	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:09:03]	Mobility Update - Group Affiliation	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:09:05]	Mobility Update - Group Affiliation	225506	FG 2	Accepted	
[04/04/08 07:09:05]	Mobility Update - Group Affiliation	225520	FG 11	Accepted	
[04/04/08 07:09:05]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:09:06]	Mobility Update - Location Registration	266XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:09:11]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Copy that. Squad 25 to the rear.
[04/04/08 07:09:15]	Call Activity Update - Start of New Call	268XXX	FG 2	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 07:09:17]	Call Activity Update - Start of New Call	225067	FD WEST	Reason for Busy = No Reason	
[04/04/08 07:09:18]	Call Activity Update - PTT-ID Update	225022	FG 11	Act/Busy Stat = Global Active	E26 OIC: Interior, interior, [distorted] back door.
[04/04/08 07:09:18]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:09:18]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:09:20]	Mobility Update - Group Affiliation	225041	FG 11	Accepted	
[04/04/08 07:09:22]	Mobility Update - Location Registration	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:09:22]	Radio Status Traffic - Subscriber Reject	225081	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:09:24]	Call Activity Update - Start of New Call	4002	FD WEST	Reason for Busy = No Reason	
[04/04/08 07:09:27]	Call Activity Update - Start of New Call	242009	FG 2	Reason for Busy = No Reason	RAT COMMAND: RAT operations to Command, we got a -- we got a person that we're pulling out of the basement. If you've got a medic crew, bring them up and forward if you can.
[04/04/08 07:09:30]	Mobility Update - Group Affiliation	225035	FG 2	Accepted	
[04/04/08 07:09:33]	Call Activity Update - Start of New Call	225081	FG 11	Reason for Busy = No Reason	Car 2514: Engine 26, are you still in the building?
[04/04/08 07:09:38]	Call Activity Update - PTT-ID Update	225037	FG 2	Act/Busy Stat = Global Active	
[04/04/08 07:09:38]	Radio Status Traffic - Subscriber Reject	225088	FG 2	#144, Stealth Reject	
[04/04/08 07:09:40]	Call Activity Update - PTT-ID Update	225008	FG 11	Act/Busy Stat = Global Active	Car 2506: Accountability, that's affirmative. But we have a visual on Engine 26.
[04/04/08 07:09:41]	Radio Status Traffic - Subscriber Reject	225022	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:09:41]	Radio Status Traffic - Subscriber Reject	242002	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:09:42]	Mobility Update - Group Affiliation	256XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:09:43]	Radio Status Traffic - Subscriber Reject	225022	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:09:47]	Call Activity Update - PTT-ID Update	225081	FG 11	Act/Busy Stat = Global Active	Car 2514: That's clear.
[04/04/08 07:09:50]	Mobility Update - Group Affiliation	253XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:09:53]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:09:56]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Front from Command.
[04/04/08 07:09:59]	Mobility Update - Group Affiliation	248XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:09:59]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:10:00]	Mobility Update - Group Affiliation	274XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:10:02]	Mobility Update - Group Affiliation	225035	FD WEST	Accepted	
[04/04/08 07:10:03]	Mobility Update - Group Affiliation	225037	FG 11	Accepted	
[04/04/08 07:10:04]	Call Activity Update - Start of New Call	225081	FG 11	Reason for Busy = No Reason	Car 2514: Are you calling front sector?
[04/04/08 07:10:08]	Mobility Update - Group Affiliation	403127	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:10:12]	Mobility Update - Group Affiliation	213XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:10:13]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Front from Command.
[04/04/08 07:10:15]	Mobility Update - Group Affiliation	213XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:10:15]	Mobility Update - Group Affiliation	403131	FD WEST	Accepted	
[04/04/08 07:10:16]	Call Activity Update - PTT-ID Update	225081	FG 11	Act/Busy Stat = Global Active	Car 2514: Go head, Command.
[04/04/08 07:10:19]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: I called a defense. What I want to do is make sure you've pulled your crews out, we've got complete accountability, and we're doing things in a very measured way. I'd like you to pull that --
[04/04/08 07:10:20]	Mobility Update - Group Affiliation	403131	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:10:24]	Mobility Update - Group Affiliation	242039	FD WEST	Accepted	
[04/04/08 07:10:26]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:10:27]	Mobility Update - Location Registration	253XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:10:29]	Mobility Update - Group Affiliation	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:10:35]	Mobility Update - Location Registration	253XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:10:36]	Call Activity Update - PTT-ID Update	225081	FG 11	Act/Busy Stat = Global Active	Car 2514: I have everybody pulled out with the exception of Engine 26, and the rear has got them right now.
[04/04/08 07:10:46]	Mobility Update - Group Affiliation	278XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:10:49]	Radio Status Traffic - Subscriber Reject	225005	FG 11	#144, Stealth Reject	
[04/04/08 07:10:49]	Call Activity Update - Start of New Call	225007	FG 11	Reason for Busy = No Reason	Car 2508: Command from rear.
[04/04/08 07:10:50]	Mobility Update - Group Affiliation	279XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:10:51]	Radio Status Traffic - Subscriber Reject	225005	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:10:54]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command, copy on that. Command to accountability.
[04/04/08 07:11:01]	Call Activity Update - Start of New Call	242045	FD WEST	Reason for Busy = No Reason	
[04/04/08 07:11:02]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:11:03]	Call Activity Update - Start of New Call	225022	FG 11	Reason for Busy = No Reason	
[04/04/08 07:11:03]	Mobility Update - Group Affiliation	225035	FG 2	Accepted	
[04/04/08 07:11:06]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:11:09]	Call Activity Update - PTT-ID Update	242045	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:11:13]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Accountability from command.
[04/04/08 07:11:13]	Mobility Update - Group Affiliation	240XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:11:14]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:11:14]	Mobility Update - Group Affiliation	225035	FD WEST	Accepted	
[04/04/08 07:11:15]	Mobility Update - Group Affiliation	256XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:11:17]	Call Activity Update - PTT-ID Update	225008	FG 11	Act/Busy Stat = Global Active	Car 2506: Accountability, go ahead.
[04/04/08 07:11:21]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: I need to know who's assigned to RAT and I need to make sure we've got accountability for those personnel. At your first opportunity, could you do that.
[04/04/08 07:11:21]	Call Activity Update - PTT-ID Update	242045	FD WEST	Act/Busy Stat = Global Active	

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### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:11:24]	<b>Radio Status Traffic - Subscriber Reject</b>	225022	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:11:26]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:11:28]	Mobility Update - Group Affiliation	268XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:11:28]	Mobility Update - Group Affiliation	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:11:30]	Mobility Update - Group Affiliation	256XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:11:32]	Call Activity Update - PTT-ID Update	225008	FG 11	Act/Busy Stat = Global Active	Car 2506: Be advised I have accountability for Engine 26. We have a crew of four. They're in the rear basement part of the building.
[04/04/08 07:11:34]	Mobility Update - Group Affiliation	256XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:11:35]	<b>Mobility Update - Location Registration</b>	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:11:35]	Mobility Update - Group Affiliation	256XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:11:39]	Mobility Update - Group Affiliation	256XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:11:45]	Mobility Update - Group Affiliation	225006	FG 11	Accepted	
[04/04/08 07:11:45]	Mobility Update - Group Affiliation	253XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:11:45]	Mobility Update - Group Affiliation	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:11:46]	<b>Call Activity Update - Start of New Call</b>	225007	FG 11	Reason for Busy = No Reason	Car 2508: Command from rear.
[04/04/08 07:11:47]	<b>Mobility Update - Location Registration</b>	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:11:50]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Rear, go ahead.
[04/04/08 07:11:50]	Mobility Update - Group Affiliation	247XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:11:50]	Mobility Update - Group Affiliation	278XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:11:52]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:11:53]	Call Activity Update - PTT-ID Update	225007	FG 11	Act/Busy Stat = Global Active	Car 2508: We definitely have one. E26 OIC wants to leave them where they're at now for investigation.
[04/04/08 07:11:54]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:11:55]	Mobility Update - Group Affiliation	242016	FD WEST	Accepted	
[04/04/08 07:11:56]	Mobility Update - Group Affiliation	240XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:11:56]	Mobility Update - Group Affiliation	240XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:11:57]	Mobility Update - Group Affiliation	247XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:01]	Call Activity Update - PTT-ID Update	242005	FG 11	Act/Busy Stat = Global Active	
[04/04/08 07:12:03]	<b>Radio Status Traffic - Subscriber Reject</b>	225005	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:12:04]	Mobility Update - Group Affiliation	213XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:04]	<b>Mobility Update - Location Registration</b>	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:05]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command to rear, your transmission was a little bit muffled. Could you try that again, please?
[04/04/08 07:12:05]	<b>Mobility Update - Location Registration</b>	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:05]	Mobility Update - Group Affiliation	407807	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:07]	<b>Radio Status Traffic - Subscriber Reject</b>	225501	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:12:09]	Mobility Update - Group Affiliation	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:11]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:12]	<b>Radio Status Traffic - Subscriber Reject</b>	279XXX	FD WEST	#147, Talkgroup request was made on a regrouped Talkgroup	***NON-RESPONDING UNIT
[04/04/08 07:12:12]	<b>Call Activity Update - Start of New Call</b>	279XXX	FD WEST	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 07:12:14]	Call Activity Update - PTT-ID Update	225007	FG 11	Act/Busy Stat = Global Active	Car 2508: [Inaudible] will be out for a face-to-face.
[04/04/08 07:12:14]	Mobility Update - Group Affiliation	225503	FD WEST	Accepted	
[04/04/08 07:12:15]	Mobility Update - Group Affiliation	225501	FG 11	Accepted	
[04/04/08 07:12:15]	Call Activity Update - PTT-ID Update	279XXX	FD WEST	Act/Busy Stat = Global Active	***NON-RESPONDING UNIT
[04/04/08 07:12:17]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:12:17]	Mobility Update - Group Affiliation	227019	FG 11	Accepted	
[04/04/08 07:12:18]	Mobility Update - Group Affiliation	258XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:19]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command is clear.
[04/04/08 07:12:19]	Mobility Update - Group Affiliation	225067	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:19]	Mobility Update - Group Affiliation	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:20]	Call Activity Update - PTT-ID Update	279XXX	FD WEST	Act/Busy Stat = Global Active	***NON-RESPONDING UNIT
[04/04/08 07:12:21]	Mobility Update - Group Affiliation	225067	FD WEST	Accepted	
[04/04/08 07:12:21]	Mobility Update - Group Affiliation	256XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:23]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: Squirrelsnest Command, information, you're at 35 minutes on your Mayday.
[04/04/08 07:12:24]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:12:24]	Mobility Update - Location Registration	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:26]	Mobility Update - Group Affiliation	225036	FG 11	Accepted	
[04/04/08 07:12:26]	Mobility Update - Group Affiliation	225067	FD WEST	Accepted	
[04/04/08 07:12:27]	Call Activity Update - Start of New Call	242009	FG 2	Reason for Busy = No Reason	RAT COMMAND: RAT operations to Command.
[04/04/08 07:12:28]	Mobility Update - Group Affiliation	225035	FG 2	Accepted	
[04/04/08 07:12:29]	Mobility Update - Group Affiliation	227001	FG 11	Accepted	
[04/04/08 07:12:29]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:30]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: You're at 35 minutes on your Mayday.
[04/04/08 07:12:30]	Mobility Update - Group Affiliation	242006	FG 11	Accepted	
[04/04/08 07:12:31]	Mobility Update - Group Affiliation	225044	FD WEST	Accepted	
[04/04/08 07:12:31]	Mobility Update - Group Affiliation	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:32]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:34]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command, go ahead.
[04/04/08 07:12:37]	Mobility Update - Location Registration	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:39]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command to communication, we've located one firefighter. Operations are continuing.
[04/04/08 07:12:42]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:42]	Mobility Update - Group Affiliation	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:44]	Call Activity Update - Start of New Call	242009	FG 2	Reason for Busy = No Reason	RAT COMMAND: RAT operations to command.
[04/04/08 07:12:47]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: Okay, that's clear. Clear on one firefighter located, operations are continuing. 7:12, break.
[04/04/08 07:12:49]	Mobility Update - Group Affiliation	624302	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:50]	Call Activity Update - Start of New Call	225503	FD WEST	Reason for Busy = No Reason	
[04/04/08 07:12:51]	Call Activity Update - PTT-ID Update	225503	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:12:51]	Mobility Update - Group Affiliation	279XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:53]	Mobility Update - Group Affiliation	248XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:12:54]	Call Activity Update - PTT-ID Update	242045	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:12:55]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:12:56]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Go ahead.
[04/04/08 07:12:57]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:12:58]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: We've notified University Hospital of a possible pending transport there.
[04/04/08 07:13:00]	Mobility Update - Group Affiliation	256XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:13:01]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:13:02]	Call Activity Update - PTT-ID Update	278XXX	FD WEST	Act/Busy Stat = Global Active	***NON-RESPONDING UNIT
[04/04/08 07:13:04]	Mobility Update - Group Affiliation	279XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:13:05]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:13:05]	Mobility Update - Group Affiliation	225096	FG 2	Accepted	
[04/04/08 07:13:05]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:13:06]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: I appreciate that. Will advise
[04/04/08 07:13:09]	Mobility Update - Group Affiliation	242004	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:13:10]	Mobility Update - Group Affiliation	278XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:13:11]	Call Activity Update - Start of New Call	225068	FD WEST	Reason for Busy = No Reason	
[04/04/08 07:13:12]	Mobility Update - Group Affiliation	248XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:13:13]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:13:13]	Mobility Update - Group Affiliation	222XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:13:13]	Mobility Update - Group Affiliation	225506	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:13:15]	Call Activity Update - Start of New Call	8016	FG 11	Reason for Busy = No Reason	HCCC: Also, University is re-offering their ground crew.
[04/04/08 07:13:16]	Call Activity Update - PTT-ID Update	225044	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:13:19]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:13:20]	Mobility Update - Group Affiliation	248XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:13:21]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Copy that. I suppose you can send them in this direction. I'm not sure what our timing is going to be on further activity.
[04/04/08 07:13:21]	Mobility Update - Group Affiliation	248XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:13:23]	Mobility Update - Group Affiliation	256XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:13:25]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:13:32]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:13:33]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: That's clear.
[04/04/08 07:13:46]	Mobility Update - Location Registration	245XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:13:47]	Mobility Update - Location Registration	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:13:47]	Mobility Update - Location Registration	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:13:48]	Mobility Update - Location Registration	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:13:52]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Front from Command.
[04/04/08 07:13:53]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:13:54]	Mobility Update - Group Affiliation	213XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:13:56]	Call Activity Update - PTT-ID Update	225081	FG 11	Act/Busy Stat = Global Active	Car 2514: Go ahead, Command.
[04/04/08 07:13:59]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Front, what are the conditions from your location now?
[04/04/08 07:14:05]	Call Activity Update - PTT-ID Update	225081	FG 11	Act/Busy Stat = Global Active	Car 2514: It appears that we've got everything on the second floor down. We don't have anything coming out of the garage right now, nor do we have anything in front section of the house. I can look through and see a glow, but I can't tell what it is.
[04/04/08 07:14:05]	Mobility Update - Group Affiliation	248XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:14:07]	Mobility Update - Group Affiliation	248XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:14:21]	Mobility Update - Group Affiliation	206XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:14:21]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Clear Rear from Command.
[04/04/08 07:14:23]	Mobility Update - Group Affiliation	225506	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:14:23]	Mobility Update - Group Affiliation	248XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:14:34]	Mobility Update - Location Registration	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:14:36]	Mobility Update - Group Affiliation	225035	FD WEST	Accepted	
[04/04/08 07:14:40]	Call Activity Update - Start of New Call	225007	FG 11	Reason for Busy = No Reason	Car 2508: Command from rear.
[04/04/08 07:14:40]	Mobility Update - Group Affiliation	297XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:14:44]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:14:45]	Mobility Update - Group Affiliation	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:14:53]	Mobility Update - Group Affiliation	278XXX	FG 11	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:14:56]	Mobility Update - Location Registration	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:15:00]	Mobility Update - Group Affiliation	290XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:15:07]	Mobility Update - Location Registration	242031	FG 11	Accepted	
[04/04/08 07:15:07]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:15:07]	Mobility Update - Location Registration	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:15:08]	Call Activity Update - Start of New Call	225081	FG 11	Reason for Busy = No Reason	Car 2514: Front to Command, could we get a PAR? I've got an Engine 109 that I don't know where their accountability is and I'd like to get a straight PAR now.
[04/04/08 07:15:10]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:15:15]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:15:23]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Front, Engine 109 was in the rear. We had an accountability on them before. We probably need to run another accountability. I'll ask accountability to do that.
[04/04/08 07:15:23]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:15:28]	Mobility Update - Group Affiliation	225044	FG 11	Accepted	
[04/04/08 07:15:30]	Mobility Update - Group Affiliation	225067	FG 11	Accepted	
[04/04/08 07:15:32]	Mobility Update - Group Affiliation	216XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:15:32]	Mobility Update - Group Affiliation	699032	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:15:35]	Call Activity Update - PTT-ID Update	225081	FG 11	Act/Busy Stat = Global Active	Car 2514: Clear.
[04/04/08 07:15:35]	Mobility Update - Group Affiliation	253XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:15:36]	Radio Status Traffic - Subscriber Reject	225008	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:15:37]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command to accountability.
[04/04/08 07:15:39]	Mobility Update - Group Affiliation	216XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:15:41]	Call Activity Update - PTT-ID Update	225008	FG 11	Act/Busy Stat = Global Active	Car 2506: Accountability is clear on the traffic.
[04/04/08 07:15:46]	Mobility Update - Group Affiliation	225070	FD WEST	Accepted	
[04/04/08 07:15:49]	Mobility Update - Group Affiliation	206XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:15:49]	Mobility Update - Group Affiliation	295XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:15:56]	Mobility Update - Group Affiliation	278XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:15:57]	Mobility Update - Group Affiliation	258XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:15:58]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:15:59]	Call Activity Update - Start of New Call	253XXX	FD WEST	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 07:16:00]	Call Activity Update - Start of New Call	242009	FG 2	Reason for Busy = No Reason	RAT COMMAND: RAT operations to Command.
[04/04/08 07:16:01]	Mobility Update - Location Registration	242031	FG 11	Accepted	
[04/04/08 07:16:03]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:16:05]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Go ahead.
[04/04/08 07:16:08]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	RAT COMMAND: Okay, I've got an active fire starting to flare up on the first floor. We need somebody to be putting that out.
[04/04/08 07:16:11]	Mobility Update - Group Affiliation	278XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:16:14]	Mobility Update - Group Affiliation	216XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:16:15]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Okay. I think we've got a sector officer around there. Can you communicate with him?
[04/04/08 07:16:15]	Mobility Update - Location Registration	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:16:24]	Call Activity Update - Start of New Call	242009	FG 2	Reason for Busy = No Reason	RAT COMMAND: Okay, we need some fuel for these fans.
[04/04/08 07:16:25]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:16:36]	Mobility Update - Group Affiliation	225057	FG 2	Accepted	
[04/04/08 07:16:36]	Mobility Update - Group Affiliation	279XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:16:39]	Mobility Update - Group Affiliation	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:16:40]	Mobility Update - Group Affiliation	256XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:16:42]	Mobility Update - Group Affiliation	256XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:16:42]	Mobility Update - Group Affiliation	256XXX	FG 2	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:16:45]	Mobility Update - Group Affiliation	258XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:16:50]	Mobility Update - Location Registration	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:16:50]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:16:51]	Mobility Update - Location Registration	240XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:16:52]	Call Activity Update - Start of New Call	242009	FG 2	Reason for Busy = No Reason	
[04/04/08 07:16:53]	Mobility Update - Group Affiliation	225057	FG 11	Accepted	
[04/04/08 07:16:55]	Mobility Update - Group Affiliation	264XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:16:57]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Command, go ahead.
[04/04/08 07:16:58]	Mobility Update - Group Affiliation	253XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:16:59]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	RAT COMMAND: I do have crews out here and ready to go in if we need them.
[04/04/08 07:16:59]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:17:00]	Mobility Update - Location Registration	245XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:17:02]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:17:02]	Mobility Update - Group Affiliation	290XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:17:03]	Call Activity Update - Start of New Call	225081	FG 11	Reason for Busy = No Reason	Car 2514: Front to Command, do we have any fire-fighting, even defensive, going on in the back that we know of?
[04/04/08 07:17:05]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Okay. Is that fire issue a prominent thing? I'm not real sure if we've got our entire accountability process done yet.
[04/04/08 07:17:07]	Mobility Update - Group Affiliation	242031	FG 11	Accepted	
[04/04/08 07:17:11]	Radio Status Traffic - Subscriber Reject	225018	FG 2	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:17:12]	Mobility Update - Group Affiliation	225037	FG 2	Accepted	
[04/04/08 07:17:12]	Mobility Update - Group Affiliation	225037	FG 2	Accepted	
[04/04/08 07:17:12]	Call Activity Update - Start of New Call	225081	FG 11	Reason for Busy = No Reason	
[04/04/08 07:17:14]	Mobility Update - Group Affiliation	242006	FD WEST	Accepted	
[04/04/08 07:17:14]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	RAT COMMAND: Okay. Let me know what you find out. I'm staying on Channel
[04/04/08 07:17:14]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:17:17]	Mobility Update - Location Registration	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:17:19]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: That's clear. Would you grab that RAT 25 crew and isolate them and keep an eye on them?
[04/04/08 07:17:22]	Call Activity Update - Start of New Call	225520	FG 11	Reason for Busy = No Reason	
[04/04/08 07:17:24]	Radio Status Traffic - Subscriber Reject	225005	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:17:25]	Mobility Update - Group Affiliation	225035	FD WEST	Accepted	
[04/04/08 07:17:26]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command to rear, did you copy that? Do you have any fire-fighting operations going on in the rear?
[04/04/08 07:17:27]	Mobility Update - Group Affiliation	225018	FG 11	Accepted	
[04/04/08 07:17:27]	Radio Status Traffic - Subscriber Reject	225029	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:17:28]	Mobility Update - Group Affiliation	279XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:17:29]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	RAT COMMAND: Okay, that's clear. Do you want them to be redeployed?
[04/04/08 07:17:31]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	
[04/04/08 07:17:32]	Mobility Update - Group Affiliation	290XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:17:34]	Call Activity Update - PTT-ID Update	225007	FG 11	Act/Busy Stat = Global Active	Car 2508: Affirmative. We're trying to knock out the fire. [Inaudible].
[04/04/08 07:17:35]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: I'm sorry, repeat.
[04/04/08 07:17:35]	Mobility Update - Location Registration	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:17:38]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	RAT COMMAND: Do you want them to be redeployed?
[04/04/08 07:17:40]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Did you copy that front?
[04/04/08 07:17:41]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: That's negative.

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:17:41]	Mobility Update - Group Affiliation	268XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:17:45]	Call Activity Update - PTT-ID Update	225081	FG 11	Act/Busy Stat = Global Active	Car 2514: Negative, repeat it for me
[04/04/08 07:17:50]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Front, go ahead and contact rear directly. He can advise.
[04/04/08 07:17:56]	Call Activity Update - PTT-ID Update	225081	FG 11	Act/Busy Stat = Global Active	Car 2514: Front to rear, could you give me an update on what's going on as far as the fire-fighting? I understand the rescue is being [inaudible] from back there also.
[04/04/08 07:17:58]	Mobility Update - Group Affiliation	225021	FG 11	Accepted	
[04/04/08 07:18:01]	Mobility Update - Group Affiliation	225505	FG 11	Accepted	
[04/04/08 07:18:01]	Call Activity Update - Start of New Call	242009	FG 2	Reason for Busy = No Reason	RAT COMMAND: Okay, Engine 25's crew is coming up to your command post. I have advised them of the same.
[04/04/08 07:18:01]	Mobility Update - Location Registration	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:18:04]	Mobility Update - Group Affiliation	225508	FD WEST	Accepted	
[04/04/08 07:18:04]	Mobility Update - Group Affiliation	253XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:18:07]	Call Activity Update - PTT-ID Update	225007	FG 11	Act/Busy Stat = Global Active	Car 2508: We're trying to put the fire out
[04/04/08 07:18:07]	Mobility Update - Group Affiliation	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:18:09]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: I'm sorry, RAT ops, can you repeat that?
[04/04/08 07:18:11]	Mobility Update - Group Affiliation	225508	FG 11	Accepted	
[04/04/08 07:18:12]	Call Activity Update - PTT-ID Update	242009	FG 2	Act/Busy Stat = Global Active	RAT COMMAND: The Engine 25 crew is coming to you and I've advised them that they were done.
[04/04/08 07:18:12]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:18:14]	Mobility Update - Group Affiliation	699032	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:18:20]	Call Activity Update - PTT-ID Update	225088	FG 2	Act/Busy Stat = Global Active	D-25: Okay, that's clear.
[04/04/08 07:18:21]	Mobility Update - Location Registration	245XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:18:21]	Mobility Update - Group Affiliation	248XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:18:23]	Mobility Update - Group Affiliation	290XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:18:27]	Call Activity Update - Start of New Call	225081	FG 11	Reason for Busy = No Reason	Car 2514: Front to rear, we're starting to get heavy smoke coming from the attic [inaudible] over the garage. Have you got anything that you can open up or see back there?
[04/04/08 07:18:30]	Mobility Update - Group Affiliation	286XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:18:33]	Mobility Update - Group Affiliation	242016	FG 11	Accepted	
[04/04/08 07:18:37]	Call Activity Update - Start of New Call	242002	FG 2	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 07:18:45]	Mobility Update - Group Affiliation	290XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:18:50]	Mobility Update - Group Affiliation	403131	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:18:51]	Mobility Update - Group Affiliation	403127	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:18:52]	Mobility Update - Group Affiliation	292XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:18:55]	Mobility Update - Group Affiliation	253XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:18:58]	Mobility Update - Group Affiliation	268XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:18:59]	Mobility Update - Location Registration	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:19:01]	Mobility Update - Group Affiliation	216XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:19:03]	Call Activity Update - Start of New Call	242009	FG 2	Reason for Busy = No Reason	RAT COMMAND: RAT operations to Command, we're getting a pretty good amount of smoke gearing up again from the A side.
[04/04/08 07:19:03]	Mobility Update - Group Affiliation	253XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:19:08]	Mobility Update - Group Affiliation	262XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:19:13]	Mobility Update - Group Affiliation	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:19:13]	Mobility Update - Group Affiliation	296XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:19:16]	Mobility Update - Location Registration	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:19:16]	Mobility Update - Group Affiliation	290XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:19:27]	Mobility Update - Group Affiliation	225083	FD WEST	Accepted	
[04/04/08 07:19:37]	Mobility Update - Group Affiliation	262XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:19:38]	Mobility Update - Group Affiliation	227001	FG 2	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:19:39]	Mobility Update - Group Affiliation	268XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:19:40]	Mobility Update - Location Registration	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:19:44]	Mobility Update - Location Registration	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:19:45]	Mobility Update - Location Registration	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:19:46]	Mobility Update - Location Registration	216XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:19:46]	Mobility Update - Location Registration	216XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:19:52]	Mobility Update - Location Registration	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:19:53]	Mobility Update - Group Affiliation	240XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:20:02]	Call Activity Update - Start of New Call	242009	FG 2	Reason for Busy = No Reason	RAT COMMAND: RAT operations to Command, be advised I have Ladder 42 ready to go to work and I got a six-person crew from Ross Township ready to go to work.
[04/04/08 07:20:02]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:20:08]	Mobility Update - Group Affiliation	225080	FD WEST	Accepted	
[04/04/08 07:20:08]	Mobility Update - Location Registration	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:20:13]	Mobility Update - Group Affiliation	225080	FG 11	Accepted	
[04/04/08 07:20:14]	Mobility Update - Group Affiliation	225057	FG 2	Accepted	
[04/04/08 07:20:14]	Mobility Update - Group Affiliation	624201	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:20:15]	Mobility Update - Location Registration	624201	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:20:18]	Mobility Update - Group Affiliation	225057	FG 11	Accepted	
[04/04/08 07:20:24]	Mobility Update - Group Affiliation	259XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:20:25]	Mobility Update - Group Affiliation	225095	FG 2	Accepted	
[04/04/08 07:20:26]	Mobility Update - Location Registration	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:20:30]	Mobility Update - Group Affiliation	624302	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:20:35]	Mobility Update - Group Affiliation	268XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:20:43]	Mobility Update - Group Affiliation	225083	FG 2	Accepted	
[04/04/08 07:20:45]	Mobility Update - Group Affiliation	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:20:47]	Mobility Update - Group Affiliation	699032	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:20:53]	Mobility Update - Group Affiliation	157XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:20:58]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:20:58]	Mobility Update - Group Affiliation	259XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:20:58]	Mobility Update - Location Registration	266XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:02]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:07]	Mobility Update - Location Registration	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:11]	Mobility Update - Group Affiliation	268XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:22]	Mobility Update - Group Affiliation	264XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:22]	Mobility Update - Location Registration	266XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:27]	Mobility Update - Group Affiliation	225080	FG 2	Accepted	
[04/04/08 07:21:27]	Mobility Update - Group Affiliation	278XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:29]	Mobility Update - Group Affiliation	216XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:31]	Mobility Update - Group Affiliation	225037	FG 11	Accepted	
[04/04/08 07:21:32]	Mobility Update - Group Affiliation	279XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:34]	Mobility Update - Location Registration	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:34]	Mobility Update - Group Affiliation	268XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:35]	Mobility Update - Group Affiliation	262XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:37]	Mobility Update - Group Affiliation	699032	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:38]	Mobility Update - Location Registration	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:39]	Mobility Update - Location Registration	699032	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:40]	Mobility Update - Group Affiliation	225095	FG 11	Accepted	
[04/04/08 07:21:41]	Call Activity Update - Start of New Call	225094	FG 11	Reason for Busy = No Reason	
[04/04/08 07:21:41]	Mobility Update - Location Registration	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:21:51]	Mobility Update - Location Registration	216XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:53]	Mobility Update - Group Affiliation	253XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:55]	Mobility Update - Group Affiliation	239XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:55]	Mobility Update - Location Registration	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:56]	Mobility Update - Group Affiliation	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:56]	Mobility Update - Group Affiliation	253XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:56]	Mobility Update - Location Registration	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:21:57]	Mobility Update - Group Affiliation	225061	FG 11	Accepted	
[04/04/08 07:22:05]	Mobility Update - Group Affiliation	225061	FG 2	Accepted	
[04/04/08 07:22:05]	Mobility Update - Group Affiliation	225083	FG 2	Accepted	
[04/04/08 07:22:05]	Mobility Update - Group Affiliation	279XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:22:07]	Mobility Update - Location Registration	308116	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:22:10]	Call Activity Update - Start of New Call	225080	FG 2	Reason for Busy = No Reason	
[04/04/08 07:22:13]	Mobility Update - Group Affiliation	225506	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:22:17]	Mobility Update - Group Affiliation	225506	FD WEST	Accepted	
[04/04/08 07:22:18]	Mobility Update - Group Affiliation	245XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:22:21]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:22:21]	Mobility Update - Location Registration	308116	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:22:24]	Mobility Update - Group Affiliation	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:22:30]	Mobility Update - Group Affiliation	279XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:22:34]	Mobility Update - Location Registration	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:22:36]	Mobility Update - Group Affiliation	225057	FG 2	Accepted	
[04/04/08 07:22:38]	Mobility Update - Group Affiliation	227004	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:22:38]	Mobility Update - Group Affiliation	279XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:22:46]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: [Captain ] from command.
[04/04/08 07:22:47]	Mobility Update - Group Affiliation	225057	FG 11	Accepted	
[04/04/08 07:22:48]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:22:50]	Mobility Update - Group Affiliation	403123	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:22:52]	Call Activity Update - Start of New Call	225036	FG 11	Reason for Busy = No Reason	[CAPTAIN]: Go ahead.
[04/04/08 07:22:54]	Mobility Update - Group Affiliation	225035	FG 11	Accepted	
[04/04/08 07:22:55]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Could you report to command vehicle.
[04/04/08 07:22:56]	Mobility Update - Location Registration	266XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:22:59]	Mobility Update - Location Registration	157XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:22:59]	Mobility Update - Group Affiliation	216XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:22:59]	Call Activity Update - PTT-ID Update	225036	FG 11	Act/Busy Stat = Global Active	[CAPTAIN]: Affirm.
[04/04/08 07:22:59]	Mobility Update - Group Affiliation	268XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:22:59]	Mobility Update - Group Affiliation	279XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:00]	Mobility Update - Location Registration	266XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:03]	Call Activity Update - PTT-ID Update	225025	FG 11	Act/Busy Stat = Global Active	
[04/04/08 07:23:04]	Mobility Update - Location Registration	266XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:07]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: To front from Command.
[04/04/08 07:23:12]	Mobility Update - Group Affiliation	213XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:14]	Call Activity Update - Start of New Call	225081	FG 11	Reason for Busy = No Reason	Car 2514: Go ahead, Command.
[04/04/08 07:23:18]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Stand by 1.
[04/04/08 07:23:22]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:23]	Mobility Update - Location Registration	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:24]	Mobility Update - Location Registration	266XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:26]	Mobility Update - Location Registration	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:26]	Mobility Update - Group Affiliation	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:27]	Call Activity Update - Start of New Call	225022	FG 11	Reason for Busy = No Reason	
[04/04/08 07:23:31]	Mobility Update - Group Affiliation	268XXX	FG 11	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:23:32]	Mobility Update - Location Registration	266XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:34]	Mobility Update - Group Affiliation	206XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:36]	Mobility Update - Group Affiliation	245XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:40]	Mobility Update - Group Affiliation	279XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:41]	Mobility Update - Location Registration	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:42]	Mobility Update - Location Registration	289XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:44]	Mobility Update - Location Registration	266XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:45]	Call Activity Update - Start of New Call	225025	FG 11	Reason for Busy = No Reason	
[04/04/08 07:23:46]	Mobility Update - Group Affiliation	247XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:47]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:49]	Call Activity Update - PTT-ID Update	225041	FG 11	Act/Busy Stat = Global Active	
[04/04/08 07:23:50]	Mobility Update - Group Affiliation	216XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:50]	Mobility Update - Group Affiliation	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:51]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:55]	Mobility Update - Group Affiliation	216XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:55]	Call Activity Update - PTT-ID Update	225098	FG 11	Act/Busy Stat = Global Active	
[04/04/08 07:23:55]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:23:59]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:24:00]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:24:01]	Call Activity Update - PTT-ID Update	225041	FG 11	Act/Busy Stat = Global Active	
[04/04/08 07:24:01]	Mobility Update - Group Affiliation	253XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:24:04]	Mobility Update - Group Affiliation	245XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:24:07]	Call Activity Update - Start of New Call	8016	FG 11	Reason for Busy = No Reason	HCCC: Communications to Command.
[04/04/08 07:24:07]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:24:10]	Mobility Update - Group Affiliation	279XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:24:12]	Call Activity Update - Start of New Call	225022	FG 11	Reason for Busy = No Reason	
[04/04/08 07:24:14]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: This is Command, go ahead.
[04/04/08 07:24:15]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:24:16]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: Can you contact headquarters at the request of [Firefighter], reference manpower? Break.
[04/04/08 07:24:16]	Mobility Update - Group Affiliation	264XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:24:17]	Mobility Update - Group Affiliation	227004	FG 11	Accepted	
[04/04/08 07:24:19]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:24:20]	Mobility Update - Location Registration	157XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:24:21]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:24:23]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Will do. Go ahead.
[04/04/08 07:24:23]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:24:23]	Mobility Update - Location Registration	266XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:24:25]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: Do you need any additional ALS or transport units up there?
[04/04/08 07:24:27]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:24:27]	Mobility Update - Location Registration	266XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:24:29]	Mobility Update - Group Affiliation	225096	FG 11	Accepted	
[04/04/08 07:24:31]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: We believe we have three on the scene. That should be sufficient for right now. We'll advise if we need something additional.
[04/04/08 07:24:32]	Mobility Update - Group Affiliation	259XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:24:37]	Mobility Update - Group Affiliation	292XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:24:39]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: Yes, sir. We also are notifying Red Cross.
[04/04/08 07:24:45]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Copy. And could you notify the CIS team for us, the CID team?
[04/04/08 07:24:46]	Mobility Update - Group Affiliation	227001	FG 11	Accepted	
[04/04/08 07:24:47]	Radio Status Traffic - Subscriber Reject	225097	FG 11	#71, Individual not allowed to interrupt current audio source	

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:24:48]	Mobility Update - Group Affiliation	242005	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:24:48]	Mobility Update - Group Affiliation	273XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:24:54]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: It's already been done.
[04/04/08 07:24:58]	Mobility Update - Location Registration	283XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:25:02]	Mobility Update - Location Registration	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:25:04]	Mobility Update - Group Affiliation	225020	FG 11	Accepted	
[04/04/08 07:25:04]	Mobility Update - Group Affiliation	242039	FD WEST	Accepted	
[04/04/08 07:25:07]	Mobility Update - Location Registration	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:25:08]	Mobility Update - Group Affiliation	245XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:25:08]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:25:12]	Mobility Update - Group Affiliation	268XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:25:19]	Mobility Update - Group Affiliation	292XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:25:20]	Mobility Update - Group Affiliation	268XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:25:21]	Call Activity Update - Start of New Call	225081	FG 11	Reason for Busy = No Reason	Car 2514: Command, I have Duke wanting to shut off the electric here. Do you have a location you want him to start at?
[04/04/08 07:25:25]	Mobility Update - Group Affiliation	268XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:25:29]	Mobility Update - Group Affiliation	157XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:25:33]	Mobility Update - Group Affiliation	225071	FD WEST	Accepted	
[04/04/08 07:25:34]	Call Activity Update - Start of New Call	225022	FG 11	Reason for Busy = No Reason	
[04/04/08 07:25:36]	Radio Status Traffic - Subscriber Reject	225005	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:25:36]	Mobility Update - Group Affiliation	292XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:25:39]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Unit calling Command, repeat.
[04/04/08 07:25:41]	Mobility Update - Group Affiliation	292XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:25:41]	Mobility Update - Group Affiliation	292XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:25:47]	Call Activity Update - Start of New Call	225025	FG 11	Reason for Busy = No Reason	
[04/04/08 07:25:55]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Front, did you have traffic for Command?
[04/04/08 07:25:57]	Mobility Update - Group Affiliation	225002	FG 2	Accepted	
[04/04/08 07:25:57]	Radio Status Traffic - Subscriber Reject	225018	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:25:59]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:26:02]	Mobility Update - Group Affiliation	225002	FG 2	Accepted	
[04/04/08 07:26:04]	Mobility Update - Location Registration	227008	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:26:07]	Mobility Update - Location Registration	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:26:09]	Call Activity Update - Start of New Call	225081	FG 11	Reason for Busy = No Reason	Car 2514: Front to Command, we're shutting down all electric to this side.
[04/04/08 07:26:14]	Mobility Update - Location Registration	157XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:26:18]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command's clear.
[04/04/08 07:26:21]	Call Activity Update - PTT-ID Update	225022	FG 11	Act/Busy Stat = Global Active	
[04/04/08 07:26:22]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:26:23]	Mobility Update - Group Affiliation	225098	FG 11	Accepted	
[04/04/08 07:26:24]	Radio Status Traffic - Subscriber Reject	225007	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:26:24]	Mobility Update - Group Affiliation	225083	FG 11	Accepted	
[04/04/08 07:26:25]	Mobility Update - Group Affiliation	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:26:26]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:26:27]	Mobility Update - Location Registration	227008	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:26:28]	Call Activity Update - Start of New Call	225007	FG 11	Reason for Busy = No Reason	Car 2508: Command from rear.
[04/04/08 07:26:28]	Mobility Update - Group Affiliation	278XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:26:29]	Mobility Update - Group Affiliation	624201	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:26:30]	Mobility Update - Group Affiliation	259XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:26:32]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:26:33]	Mobility Update - Group Affiliation	286XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:26:34]	Mobility Update - Location Registration	206XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:26:35]	Mobility Update - Group Affiliation	259XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:26:36]	Call Activity Update - Start of New Call	225025	FG 11	Reason for Busy = No Reason	
[04/04/08 07:26:37]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:26:39]	Mobility Update - Group Affiliation	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:26:40]	Mobility Update - Group Affiliation	225002	FG 2	Accepted	
[04/04/08 07:26:40]	Mobility Update - Group Affiliation	278XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:26:42]	Call Activity Update - PTT-ID Update	225009	FG 11	Act/Busy Stat = Global Active	Car 2507: Car 7 to Command.
[04/04/08 07:26:43]	Radio Status Traffic - Subscriber Reject	225082	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:26:44]	Mobility Update - Group Affiliation	273XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:26:45]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Go ahead Car 7.
[04/04/08 07:26:48]	Mobility Update - Group Affiliation	240XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:26:49]	Call Activity Update - PTT-ID Update	225009	FG 11	Act/Busy Stat = Global Active	Car 2507: We'd like to get a couple lines of people around this side and the back to help bring them up.
[04/04/08 07:26:59]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Communicate that with the front. They have reserve personnel.
[04/04/08 07:27:00]	Mobility Update - Group Affiliation	279XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:27:01]	Mobility Update - Group Affiliation	240XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:27:07]	Mobility Update - Group Affiliation	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:27:07]	Call Activity Update - Start of New Call	225009	FG 11	Reason for Busy = No Reason	Car 2507: Car 7 to front.
[04/04/08 07:27:09]	Mobility Update - Group Affiliation	262XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:27:10]	Call Activity Update - PTT-ID Update	225081	FG 11	Act/Busy Stat = Global Active	Car 2514: I copy. I'm setting it up now
[04/04/08 07:27:10]	Mobility Update - Group Affiliation	268XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:27:13]	Radio Status Traffic - Subscriber Reject	225022	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:27:14]	Mobility Update - Location Registration	157XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:27:14]	Mobility Update - Group Affiliation	225002	FG 2	Accepted	
[04/04/08 07:27:17]	Mobility Update - Group Affiliation	262XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:27:25]	Call Activity Update - Start of New Call	225007	FG 11	Reason for Busy = No Reason	Car 2508: Command from rear, can you get a light or a lights stretched around to the back here, to help us further evaluate the situation, as well as a CO detector?
[04/04/08 07:27:32]	Mobility Update - Group Affiliation	225018	FG 11	Accepted	
[04/04/08 07:27:32]	Mobility Update - Group Affiliation	247XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:27:33]	Radio Status Traffic - Subscriber Reject	225018	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:27:36]	Mobility Update - Group Affiliation	268XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:27:37]	Mobility Update - Group Affiliation	279XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:27:38]	Mobility Update - Group Affiliation	256XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:27:39]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Rear, did you say you need lights to the rear?
[04/04/08 07:27:39]	Radio Status Traffic - Subscriber Reject	225022	FG 11	#144, Stealth Reject	
[04/04/08 07:27:39]	Call Activity Update - Start of New Call	268XXX	FD WEST	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 07:27:40]	Mobility Update - Group Affiliation	268XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:27:42]	Call Activity Update - PTT-ID Update	225007	FG 11	Act/Busy Stat = Global Active	Car 2508: Affirmative. If we could get lights to help evaluate the situation better, as well as a CO detector.
[04/04/08 07:27:44]	Mobility Update - Group Affiliation	225002	FG 11	Accepted	
[04/04/08 07:27:46]	Mobility Update - Location Registration	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:27:48]	Mobility Update - Location Registration	206XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:27:50]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Front from Command, did you copy rear's requests?

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:27:58]	Call Activity Update - PTT-ID Update	225081	FG 11	Act/Busy Stat = Global Active	Car 2514: Yes. I've got Ross and Engine 28 going down to set it up.
[04/04/08 07:28:00]	Call Activity Update - Start of New Call	279XXX	FD WEST	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 07:28:03]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:28:07]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command's clear.
[04/04/08 07:28:12]	Mobility Update - Group Affiliation	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:28:16]	Mobility Update - Location Registration	308116	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:28:24]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:28:25]	Mobility Update - Group Affiliation	295XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:28:27]	Mobility Update - Group Affiliation	609301	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:28:29]	Mobility Update - Group Affiliation	225057	FG 2	Accepted	
[04/04/08 07:28:34]	Mobility Update - Group Affiliation	225057	FD WEST	Accepted	
[04/04/08 07:28:36]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:28:38]	Mobility Update - Location Registration	206XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:28:49]	Mobility Update - Group Affiliation	283XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:28:52]	Mobility Update - Location Registration	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:28:52]	Mobility Update - Group Affiliation	699016	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:28:54]	Call Activity Update - Start of New Call	225020	FG 11	Reason for Busy = No Reason	
[04/04/08 07:28:54]	Mobility Update - Group Affiliation	268XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:28:55]	Mobility Update - Location Registration	699016	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:28:56]	Mobility Update - Group Affiliation	206XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:29:01]	Mobility Update - Location Registration	157XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:29:05]	Mobility Update - Group Affiliation	213XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:29:05]	Mobility Update - Group Affiliation	225068	FD WEST	Accepted	
[04/04/08 07:29:07]	Mobility Update - Location Registration	206XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:29:11]	Mobility Update - Location Registration	227008	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:29:16]	Mobility Update - Location Registration	227008	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:29:18]	Mobility Update - Group Affiliation	278XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:29:21]	Mobility Update - Group Affiliation	295XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:29:24]	Mobility Update - Location Registration	308116	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:29:29]	Mobility Update - Location Registration	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:29:31]	Mobility Update - Group Affiliation	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:29:33]	Mobility Update - Location Registration	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:29:36]	Mobility Update - Group Affiliation	295XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:29:37]	Mobility Update - Location Registration	157XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:29:41]	Call Activity Update - Start of New Call	225007	FG 11	Reason for Busy = No Reason	Car 2508: Command from rear, we've located a second firefighter. We need a second Stokes basket.
[04/04/08 07:29:41]	Mobility Update - Location Registration	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:29:53]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Front from Command, did you copy that? Do you have that equipment at your location?
[04/04/08 07:29:57]	Mobility Update - Group Affiliation	258XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:29:59]	Mobility Update - Group Affiliation	213XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:30:04]	Mobility Update - Group Affiliation	290XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:30:07]	Mobility Update - Location Registration	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:30:10]	Call Activity Update - Start of New Call	225020	FG 11	Reason for Busy = No Reason	E25 OIC: Engine 25 for Command, be advised we can get the Stokes off of Rescue 26.
[04/04/08 07:30:10]	Mobility Update - Group Affiliation	258XXX	FG 2	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:30:12]	Mobility Update - Group Affiliation	262XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:30:12]	Mobility Update - Group Affiliation	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:30:18]	Mobility Update - Location Registration	227008	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:30:26]	Mobility Update - Group Affiliation	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:30:28]	Mobility Update - Location Registration	279XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:30:31]	Mobility Update - Group Affiliation	213XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:30:43]	Mobility Update - Group Affiliation	267XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:30:44]	Mobility Update - Group Affiliation	157XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:30:45]	Mobility Update - Group Affiliation	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:30:47]	Mobility Update - Location Registration	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:30:50]	Mobility Update - Group Affiliation	157XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:30:50]	Call Activity Update - Start of New Call	225040	FG 11	Reason for Busy = No Reason	
[04/04/08 07:30:52]	Call Activity Update - PTT-ID Update	225040	FG 11	Act/Busy Stat = Global Active	
[04/04/08 07:30:54]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:31:01]	Call Activity Update - Start of New Call	225040	FG 11	Reason for Busy = No Reason	
[04/04/08 07:31:05]	Mobility Update - Group Affiliation	290XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:31:06]	Mobility Update - Group Affiliation	239XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:31:11]	Mobility Update - Group Affiliation	258XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:31:13]	Mobility Update - Group Affiliation	290XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:31:16]	Mobility Update - Group Affiliation	258XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:31:17]	Call Activity Update - Start of New Call	225081	FG 11	Reason for Busy = No Reason	Car 2514: Front to Command.
[04/04/08 07:31:20]	Mobility Update - Group Affiliation	239XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:31:28]	Mobility Update - Group Affiliation	268XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:31:33]	Mobility Update - Group Affiliation	262XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:31:37]	Mobility Update - Group Affiliation	213XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:31:40]	Mobility Update - Group Affiliation	308117	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:31:52]	Call Activity Update - Start of New Call	225081	FG 11	Reason for Busy = No Reason	Car 2514: Front to Command.
[04/04/08 07:31:53]	Mobility Update - Group Affiliation	308117	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:31:55]	Mobility Update - Group Affiliation	242033	FD WEST	Accepted	
[04/04/08 07:31:58]	Mobility Update - Location Registration	242033	FD WEST	Accepted	
[04/04/08 07:32:03]	Mobility Update - Location Registration	295XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:32:04]	Mobility Update - Group Affiliation	268XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:32:04]	Mobility Update - Group Affiliation	308117	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:32:05]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Command, go ahead.
[04/04/08 07:32:09]	Mobility Update - Group Affiliation	268XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:32:10]	Call Activity Update - Start of New Call	225081	FG 11	Reason for Busy = No Reason	Car 2514: Command, I'd like to resume the fire fighting. [Captain] is going to come up and explain to you what we have, and then we'll go from there.
[04/04/08 07:32:15]	Mobility Update - Group Affiliation	262XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:32:21]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Okay. He's approaching now.
[04/04/08 07:32:22]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:32:23]	Mobility Update - Location Registration	213XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:32:25]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: Communications to Command.
[04/04/08 07:32:27]	Mobility Update - Location Registration	157XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:32:29]	Mobility Update - Group Affiliation	292XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:32:30]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command, go ahead.
[04/04/08 07:32:31]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: Do you have a number available that CISD can call?
[04/04/08 07:32:34]	Mobility Update - Group Affiliation	262XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:32:35]	Mobility Update - Location Registration	213XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:32:36]	Mobility Update - Location Registration	157XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:32:36]	Mobility Update - Group Affiliation	268XXX	FG 11	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:32:37]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: I'll get back to you. We'll check on that.
[04/04/08 07:32:37]	Mobility Update - Group Affiliation	614201	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:32:39]	Mobility Update - Location Registration	614201	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:32:40]	Call Activity Update - PTT-ID Update	225082	FG 11	Act/Busy Stat = Global Active	
[04/04/08 07:32:41]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: Okay. That's clear. Information: The Air Rescue 91's ground crew is probably still 15 to 20 out.
[04/04/08 07:32:48]	Mobility Update - Group Affiliation	268XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:32:50]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: I think we can turn them around, just in case they're needed for another emergency. Could you contact them and have that done?
[04/04/08 07:32:51]	Mobility Update - Group Affiliation	609301	FD WEST	Accepted	
[04/04/08 07:32:52]	Radio Status Traffic - Subscriber Reject	225037	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:33:00]	Mobility Update - Group Affiliation	242003	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:33:01]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: Okay, that's clear, will advise. 7:33.
[04/04/08 07:33:12]	Mobility Update - Group Affiliation	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:33:16]	Mobility Update - Group Affiliation	256XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:33:17]	Mobility Update - Location Registration	279XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:33:18]	Call Activity Update - Start of New Call	8016	FG 11	Reason for Busy = No Reason	HCCC: Command, also, one hour and 20 minutes has elapsed on your event, 55 minutes of Mayday.
[04/04/08 07:33:19]	Mobility Update - Group Affiliation	227008	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:33:26]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:33:27]	Mobility Update - Group Affiliation	279XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:33:29]	Call Activity Update - Start of New Call	4002	FD WEST	Reason for Busy = No Reason	
[04/04/08 07:33:34]	Mobility Update - Location Registration	227008	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:33:41]	Call Activity Update - Start of New Call	225008	FG 11	Reason for Busy = No Reason	Car 2506: Command from accountability.
[04/04/08 07:33:42]	Mobility Update - Location Registration	227008	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:33:46]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command.
[04/04/08 07:33:48]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:33:49]	Call Activity Update - PTT-ID Update	225008	FG 11	Act/Busy Stat = Global Active	Car 2506: Be advised we do have a face-to-face PAR with all units that were on the original dispatch.
[04/04/08 07:33:55]	Mobility Update - Group Affiliation	245XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:33:57]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command's clear on that face-to-face. Thank you.
[04/04/08 07:34:00]	Mobility Update - Group Affiliation	258XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:34:02]	Mobility Update - Location Registration	227008	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:34:05]	Call Activity Update - Start of New Call	225022	FG 11	Reason for Busy = No Reason	
[04/04/08 07:34:08]	Radio Status Traffic - Subscriber Reject	225101	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:34:09]	Mobility Update - Group Affiliation	213XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:34:11]	Call Activity Update - Start of New Call	225101	FG 11	Reason for Busy = No Reason	Car 2512: Car 12 to Command, I need a transport unit. I've got the one victim.
[04/04/08 07:34:16]	Call Activity Update - PTT-ID Update	225101	FG 11	Act/Busy Stat = Global Active	
[04/04/08 07:34:20]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command to Squad 225, can you get down the driveway here?
[04/04/08 07:34:21]	Mobility Update - Location Registration	227008	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:34:22]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:34:22]	Mobility Update - Group Affiliation	279XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:34:27]	Mobility Update - Group Affiliation	274XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:34:28]	Mobility Update - Group Affiliation	253XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:34:31]	Call Activity Update - Start of New Call	225006	FG 11	Reason for Busy = No Reason	Car 2509: Car 9 to Command, we do have the one ambulance at the bottom of the driveway, behind your vehicle, that's available.
[04/04/08 07:34:32]	Radio Status Traffic - Subscriber Reject	225005	FG 11	#71, Individual not allowed to interrupt current audio source	
[04/04/08 07:34:35]	Mobility Update - Group Affiliation	225512	FG 11	Accepted	

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:34:35]	Mobility Update - Group Affiliation	268XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:34:38]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Command copies that, we have the transport unit near the command vehicle for that removal.
[04/04/08 07:34:42]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	
[04/04/08 07:34:49]	Mobility Update - Group Affiliation	216XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:34:51]	Mobility Update - Location Registration	216XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:34:52]	Call Activity Update - PTT-ID Update	225006	FG 11	Act/Busy Stat = Global Active	Car 2509: That's the unit they should have the equipment out of, with the victim.
[04/04/08 07:34:56]	Mobility Update - Group Affiliation	278XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:35:00]	Mobility Update - Group Affiliation	699016	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:35:01]	Mobility Update - Group Affiliation	240XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:35:08]	Call Activity Update - Start of New Call	292XXX	FG 2	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 07:35:09]	Mobility Update - Group Affiliation	258XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:35:24]	Mobility Update - Location Registration	295XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:35:30]	Mobility Update - Group Affiliation	600420	FD WEST	Accepted	
[04/04/08 07:35:31]	Mobility Update - Location Registration	600420	FD WEST	Accepted	
[04/04/08 07:35:33]	Mobility Update - Group Affiliation	216XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:35:36]	Mobility Update - Group Affiliation	242036	FD WEST	Accepted	
[04/04/08 07:35:36]	Mobility Update - Group Affiliation	248XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:35:36]	Call Activity Update - Start of New Call	292XXX	FG 2	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 07:35:38]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	
[04/04/08 07:35:42]	Mobility Update - Group Affiliation	222XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:35:45]	Call Activity Update - Start of New Call	225006	FG 11	Reason for Busy = No Reason	Car 2509: Car 9 to Command.
[04/04/08 07:35:48]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Car 9, go ahead.
[04/04/08 07:35:51]	Call Activity Update - PTT-ID Update	225006	FG 11	Act/Busy Stat = Global Active	Car 2509: Will that squad that you're utilizing be needed to transport?
[04/04/08 07:35:53]	Mobility Update - Group Affiliation	292XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:35:58]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: No, I think we're going to stand by, no transport at this time. And could you report to the command vehicle.
[04/04/08 07:36:01]	Mobility Update - Group Affiliation	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:36:04]	Mobility Update - Group Affiliation	222XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:36:05]	Mobility Update - Group Affiliation	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:36:07]	Call Activity Update - PTT-ID Update	225006	FG 11	Act/Busy Stat = Global Active	Car 2509: Affirmative. We're bringing another ambulance down.
[04/04/08 07:36:08]	Mobility Update - Group Affiliation	222XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:36:09]	Mobility Update - Group Affiliation	245XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:36:09]	Mobility Update - Group Affiliation	614301	FD WEST	Accepted	
[04/04/08 07:36:10]	Mobility Update - Group Affiliation	222XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:36:14]	Mobility Update - Location Registration	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:36:17]	Mobility Update - Group Affiliation	699016	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:36:18]	Mobility Update - Group Affiliation	245XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:36:24]	Mobility Update - Group Affiliation	206XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:36:36]	Mobility Update - Location Registration	216XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:36:40]	Mobility Update - Group Affiliation	268XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:36:44]	Mobility Update - Location Registration	216XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:36:46]	Mobility Update - Group Affiliation	225502	FG 11	Accepted	
[04/04/08 07:36:48]	Mobility Update - Location Registration	216XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:36:54]	Mobility Update - Group Affiliation	233XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:36:56]	Mobility Update - Location Registration	216XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:36:59]	Mobility Update - Group Affiliation	225057	FG 11	Accepted	
[04/04/08 07:36:59]	Mobility Update - Location Registration	227008	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:36:59]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:37:02]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:37:06]	Call Activity Update - Start of New Call	225029	FG 11	Reason for Busy = No Reason	
[04/04/08 07:37:07]	Mobility Update - Location Registration	227008	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:37:10]	Mobility Update - Group Affiliation	614301	FD WEST	Accepted	
[04/04/08 07:37:13]	Call Activity Update - Start of New Call	225029	FG 11	Reason for Busy = No Reason	
[04/04/08 07:37:15]	Mobility Update - Location Registration	227008	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:37:17]	Call Activity Update - Start of New Call	225029	FG 11	Reason for Busy = No Reason	
[04/04/08 07:37:18]	Mobility Update - Location Registration	289XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:37:36]	Mobility Update - Group Affiliation	278XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:37:41]	Mobility Update - Group Affiliation	242016	FD WEST	Accepted	
[04/04/08 07:37:42]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:37:43]	Mobility Update - Group Affiliation	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:37:44]	Mobility Update - Group Affiliation	278XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:37:45]	Mobility Update - Group Affiliation	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:37:49]	Mobility Update - Group Affiliation	225057	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:37:49]	Mobility Update - Group Affiliation	239XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:37:50]	Mobility Update - Group Affiliation	213XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:37:51]	Mobility Update - Group Affiliation	614206	FD WEST	Accepted	
[04/04/08 07:37:53]	Mobility Update - Group Affiliation	292XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:37:54]	Mobility Update - Group Affiliation	225057	FD WEST	Accepted	
[04/04/08 07:38:05]	Mobility Update - Group Affiliation	256XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:38:07]	Mobility Update - Location Registration	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:38:11]	Mobility Update - Group Affiliation	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:38:18]	Mobility Update - Group Affiliation	256XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:38:37]	Mobility Update - Group Affiliation	240XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:38:39]	Mobility Update - Location Registration	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:38:42]	Mobility Update - Location Registration	227001	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:38:42]	Mobility Update - Location Registration	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:38:45]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:38:46]	Mobility Update - Location Registration	286XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:38:47]	Call Activity Update - Start of New Call	225521	FG 11	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 07:38:48]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:38:57]	Mobility Update - Group Affiliation	600419	FD WEST	Accepted	
[04/04/08 07:38:57]	Mobility Update - Group Affiliation	600420	FD WEST	Accepted	
[04/04/08 07:38:59]	Mobility Update - Group Affiliation	225521	FD WEST	Accepted	
[04/04/08 07:39:05]	Mobility Update - Group Affiliation	268XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:39:07]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:39:10]	Mobility Update - Group Affiliation	271XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:39:10]	Mobility Update - Location Registration	600420	FD WEST	Accepted	
[04/04/08 07:39:12]	Mobility Update - Group Affiliation	213XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:39:14]	Call Activity Update - Start of New Call	225081	FG 11	Reason for Busy = No Reason	Car 2514: Front to command, I have Duke Energy. They're going to lock out the gas line. Is that okay?
[04/04/08 07:39:15]	Mobility Update - Group Affiliation	225521	FG 11	Accepted	
[04/04/08 07:39:20]	Mobility Update - Group Affiliation	213XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:39:25]	Call Activity Update - Start of New Call	225025	FG 11	Reason for Busy = No Reason	
[04/04/08 07:39:30]	Mobility Update - Group Affiliation	233XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:39:32]	Mobility Update - Group Affiliation	225027	FG 11	Accepted	
[04/04/08 07:39:33]	Mobility Update - Group Affiliation	295XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:39:37]	Mobility Update - Group Affiliation	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:39:45]	Call Activity Update - Start of New Call	233XXX	FD WEST	Reason for Busy = No Reason	***NON-RESPONDING UNIT

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:39:48]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:39:48]	Mobility Update - Group Affiliation	213XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:39:51]	Mobility Update - Group Affiliation	213XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:40:04]	Call Activity Update - Start of New Call	225009	FG 11	Reason for Busy = No Reason	Car 2507: Car 7 to front.
[04/04/08 07:40:07]	Mobility Update - Location Registration	216XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:40:07]	Call Activity Update - PTT-ID Update	225081	FG 11	Act/Busy Stat = Global Active	Car 2514: Go ahead, Car --
[04/04/08 07:40:10]	Call Activity Update - PTT-ID Update	225009	FG 11	Act/Busy Stat = Global Active	Car 2507: Do you have anybody working on the fire right now?
[04/04/08 07:40:15]	Call Activity Update - PTT-ID Update	225081	FG 11	Act/Busy Stat = Global Active	Car 2514: Nope.
[04/04/08 07:40:19]	Call Activity Update - Start of New Call	225009	FG 11	Reason for Busy = No Reason	Car 2507: We've got fire above the heads of the rescue crew here.
[04/04/08 07:40:25]	Call Activity Update - PTT-ID Update	225081	FG 11	Act/Busy Stat = Global Active	Car 2514: Front to 07, we've got rear crews the only one with lines working right now. Nothing's working from the front.
[04/04/08 07:40:34]	Call Activity Update - Start of New Call	225097	FG 11	Reason for Busy = No Reason	
[04/04/08 07:40:42]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:40:43]	Mobility Update - Group Affiliation	296XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:40:45]	Call Activity Update - PTT-ID Update	225009	FG 11	Act/Busy Stat = Global Active	Car 2507: We're going to have to do something on the outside here.
[04/04/08 07:40:45]	Mobility Update - Group Affiliation	268XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:40:48]	Mobility Update - Group Affiliation	225044	FD WEST	Accepted	
[04/04/08 07:40:49]	Call Activity Update - PTT-ID Update	225025	FG 11	Act/Busy Stat = Global Active	
[04/04/08 07:40:49]	Call Activity Update - Start of New Call	296XXX	FG 2	Reason for Busy = No Reason	***NON-RESPONDING UNIT
[04/04/08 07:40:50]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:40:53]	Mobility Update - Group Affiliation	213XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:40:53]	Mobility Update - Group Affiliation	213XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:40:59]	Call Activity Update - Start of New Call	225081	FG 11	Reason for Busy = No Reason	Car 2514: Front to Command, could I get somebody to bring me a spare battery up front.
[04/04/08 07:41:01]	Mobility Update - Group Affiliation	256XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:41:02]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:41:03]	Mobility Update - Location Registration	216XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:41:03]	Mobility Update - Group Affiliation	268XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:41:04]	Call Activity Update - Start of New Call	225081	FG 11	Reason for Busy = No Reason	
[04/04/08 07:41:11]	Mobility Update - Location Registration	227001	FG 11	Accepted	
[04/04/08 07:41:12]	Mobility Update - Group Affiliation	283XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:41:18]	Mobility Update - Group Affiliation	290XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:41:19]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:41:19]	Call Activity Update - PTT-ID Update	233XXX	FD WEST	Act/Busy Stat = Global Active	***NON-RESPONDING UNIT
[04/04/08 07:41:20]	Mobility Update - Group Affiliation	213XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:41:21]	Call Activity Update - PTT-ID Update	4002	FD WEST	Act/Busy Stat = Global Active	
[04/04/08 07:41:23]	Mobility Update - Location Registration	216XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:41:23]	Mobility Update - Group Affiliation	268XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:41:23]	Mobility Update - Group Affiliation	600420	FD WEST	Accepted	
[04/04/08 07:41:26]	Mobility Update - Group Affiliation	614201	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:41:27]	Mobility Update - Location Registration	216XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:41:31]	Mobility Update - Group Affiliation	225057	FG 11	Accepted	
[04/04/08 07:41:33]	Mobility Update - Group Affiliation	225044	FG 11	Accepted	
[04/04/08 07:41:34]	Call Activity Update - Start of New Call	225097	FG 11	Reason for Busy = No Reason	
[04/04/08 07:41:34]	Mobility Update - Group Affiliation	233XXX	FD WEST	Accepted	***NON-RESPONDING UNIT

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Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:41:49]	Mobility Update - Group Affiliation	259XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:41:50]	Mobility Update - Group Affiliation	225007	FG 11	Accepted	
[04/04/08 07:41:50]	Mobility Update - Location Registration	266XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:41:54]	Mobility Update - Location Registration	216XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:42:03]	Mobility Update - Group Affiliation	206XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:42:09]	Call Activity Update - Start of New Call	8016	FG 11	Reason for Busy = No Reason	HCCC: Communications to command.
[04/04/08 07:42:11]	Mobility Update - Group Affiliation	213XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:42:11]	Mobility Update - Group Affiliation	213XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:42:13]	Mobility Update - Group Affiliation	213XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:42:14]	Call Activity Update - Start of New Call	4002	FD WEST	Reason for Busy = No Reason	
[04/04/08 07:42:14]	Mobility Update - Location Registration	216XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:42:20]	Mobility Update - Group Affiliation	292XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:42:22]	Call Activity Update - Start of New Call	225079	FG 11	Reason for Busy = No Reason	
[04/04/08 07:42:23]	Mobility Update - Group Affiliation	213XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:42:26]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	
[04/04/08 07:42:30]	Mobility Update - Group Affiliation	213XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:42:31]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	Car 2501: Command, go ahead.
[04/04/08 07:42:34]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: A couple, a couple things. First of all, we're calling Red Cross for refreshments for 60. Is that approximately a good number?
[04/04/08 07:42:46]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	Car 2501: Affirmative.
[04/04/08 07:42:47]	Mobility Update - Group Affiliation	213XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:42:47]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:42:49]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: Engine 53 is moving to the 26's. And also, do we need an additional channel for a SCAT team?
[04/04/08 07:42:51]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:42:54]	Mobility Update - Group Affiliation	225102	FG 2	Accepted	
[04/04/08 07:42:55]	Mobility Update - Group Affiliation	216XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:42:57]	Mobility Update - Group Affiliation	292XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:43:00]	Call Activity Update - Start of New Call	225005	FG 11	Reason for Busy = No Reason	D-25: No, I think we'll be okay with that
[04/04/08 07:43:03]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: That's clear. We've assigned Fire Ground 11 for Six Paul units. Also, can we confirm that Mayday, the Mayday is now complete?
[04/04/08 07:43:15]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	D-25: Affirmative, Mayday complete. We can relinquish 2.
[04/04/08 07:43:17]	Mobility Update - Group Affiliation	206XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:43:19]	Mobility Update - Group Affiliation	225102	FG 11	Accepted	
[04/04/08 07:43:19]	Mobility Update - Group Affiliation	273XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:43:20]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: Okay, that's clear.
[04/04/08 07:43:22]	Mobility Update - Group Affiliation	245XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:43:23]	Mobility Update - Group Affiliation	206XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:43:23]	Call Activity Update - PTT-ID Update	225005	FG 11	Act/Busy Stat = Global Active	D-25: And also, we'd request that state fire marshal's office to be notified. Give him my cell phone direct.
[04/04/08 07:43:25]	Mobility Update - Group Affiliation	273XXX	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:43:26]	Mobility Update - Group Affiliation	242008	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:43:27]	Mobility Update - Group Affiliation	253XXX	FG 2	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:43:29]	Mobility Update - Group Affiliation	227005	FG 11	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:43:30]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	HCCC: They have been notified.
[04/04/08 07:43:31]	Mobility Update - Group Affiliation	274XXX	FD WEST	Accepted	***NON-RESPONDING UNIT
[04/04/08 07:43:33]	Mobility Update - Group Affiliation	225100	FG 11	Accepted	

## APPENDIX C continued

### Squirrelsnest LN Radio Data Logs 4/4/2008

Time	Message	UnitID	TG Alias	Result/Status	Radio Traffic
[04/04/08 07:43:34]	Call Activity Update - PTT-ID Update	8016	FG 11	Act/Busy Stat = Global Active	[ALERT TONE].HCCC: Attention all units, attention all units on the Squirrelsnest Lane detail, Mayday operations are now complete. Repeating: The Mayday is now clear. All units on the Squirrelsnest incident switch to Fire Ground 11. Attention all units, per Squirrelsnest Command, the Mayday operation is now complete. Repeating: The Mayday operation is clear. All units switch to Fire Ground 11. 7:44.

# **APPENDIX D**

## **Damaged Protective Clothing Ensemble Analysis**



## APPENDIX D

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### Damaged Protective Clothing Ensemble Analysis

#### **Honeywell First Responder Products**

(formerly Total Fire Group)

#### **Damaged PPE Analysis**

**Date: 03-August-2009**

**Prepared by: Alan Schierenbeck**

#### **Garment(s)**

Set Number One

Members Name: Schira, Brian: Firefighter

Set Number Two

Members Name: Broxterman, Robin: Captain

Before beginning a review of the Personal Protective Equipment in question, we would like to offer our condolences to the families of Captain Broxterman and Firefighter Schira, as well as to all the members of the Colerain Township Department of Fire and Emergency Services.

It is evident from the verbal descriptions given to us, the Department's July 11, 2008 report, and the condition of the Personal Protective Equipment that these two brave souls were exposed to an un-survivable condition so intense that no protective gear on Earth would have saved them.

As a preface to this gear damage report it is important to note that while we can try to determine the temperatures the PPE items and the material they are made from reached during the incident; this does not mean that the environmental temperatures they were exposed to were not higher, often much higher. Consider an every day heat exposure example like putting a pizza in an oven. It takes time to heat the pizza up to the oven temperature and cook it. Basically, the temperature an object reaches is a result of both "time and temperature exposure". Only with sufficient time will the exposed object reach the exposure temperature.

The condition of the gear that we examined is consistent with what we have observed literally hundreds of times before when any gear is placed in very close proximity, or even short term direct contact, with an extremely high heat source (convective, radiant and/or conductive).

## APPENDIX D continued

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First, let's consider specific information on the impact of heat on the clothing:

- 1) All of the outer shell and moisture barrier fabrics used in making the protective clothing are inherently flame resistant to the molecular level. As such the flame resistance cannot wear off or be washed out. The same is true of the thermal liners in question. From pristine fabric state to essential destruction, the component materials selected by the department for this gear continued to provide FR protection and hence did not accelerate the heat impact.
- 2) In all cases, and all heat sources, etc. being equal, Heat Signature Specific Damage occurs to the fabric, and its dyes and yarns, the exact same way every time. This holds true in the lab and in the field. To demonstrate how different types of heat can affect fabrics and their dyes we have attached a document on the subject. All samples seen in this document can be reproduced in our ISO 17025 Thermal Lab.
- 3) All manufacturers buy their fabrics from the same mills therefore, regardless of who stitches the fabric, the "Heat Signature Specific Damage" is the same.
- 4) Older protective clothing made from Pbi, Nomex and Kevlar that has been washed and worn (not worn out) can gain as much as 20% or more in insulation compared to new gear of the same exact materials. Other materials however, such as PVC foams, in our testing do not gain insulation with time and use.
- 5) Southern Mills, the industry's largest shell/liner supplier, has provided us with temperatures where various shell fabrics begin to rapidly degrade, meaning that while some strength loss or dye sublimation may have already occurred, when they "reach" these temperatures all their physical properties dissipate at an alarming rate and failure is imminent if not already occurring:
  - ☐ Kevlar/Basofil (60/40) - 1000 F
  - ☐ ADVANCE (60/40) Kevlar/Nomex – 1050 F There are other Kevlar Nomex outer shells not made by Southern Mills, however the spun yarn fiber composite is the same as SMI's

## APPENDIX D continued

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Advance and the “rapid degradation temperature” would therefore be in this exact range.

- ☐ Fusion (50/50) Kevlar/Nomex – A little less than 1050 F because it has less Kevlar than Advance
  - ☐ Millennia (60/40) Technora/PBO – 1300 F
  - ☐ PBI Matrix (60/40) Kevlar/PBI – 1300 F
  - ☐ PBI Gold (60/40) Kevlar/PBI – 1300 F
  - ☐ Defender 750 (93/5/2) Nomex/Kevlar/anti-stat – 700 F
  - ☐ ADVANCE Ultra – 60/20/20 – Kevlar/Nomex/PBO – 1200 F
- 6) While catastrophic degradation occurs at the temperatures noted above, outer shell fabric *dye release begins at a lower temperature in the range of 450 F to 500 F.* (see included document on this Dye Sublimation Issue)

### **Review of PPE elements**

Schira: Coat



**Massive thermal destruction penetrating all three layers of coat.**



**Pbi outer shell of left coat pocket burned away so reached 1300 F. Yet 100% Kevlar pocket lining just below intact so at that layer 900 F or less**



**Significant portions of the liner face cloth completely charred so it reached or exceeded 750 F just millimeters away from, or while in direct contact with, his station garments or skin.**



**Rear of coat. Charred and carbonized Pbi reached at least 1300 F.  
Portions of trim were carbonized/vaporized.**



**Large sections of the moisture barrier carbonized so reached at least 750 F in those areas. The Teflon underneath also carbonized as did these outward facing portions of the thermal liner and Dead Air Panels.**



Large portions of liner face cloth shown here reached over 500 F but not quite the 750 F rapid degradation point. Moisture barrier that is charred reached at least 750 f.

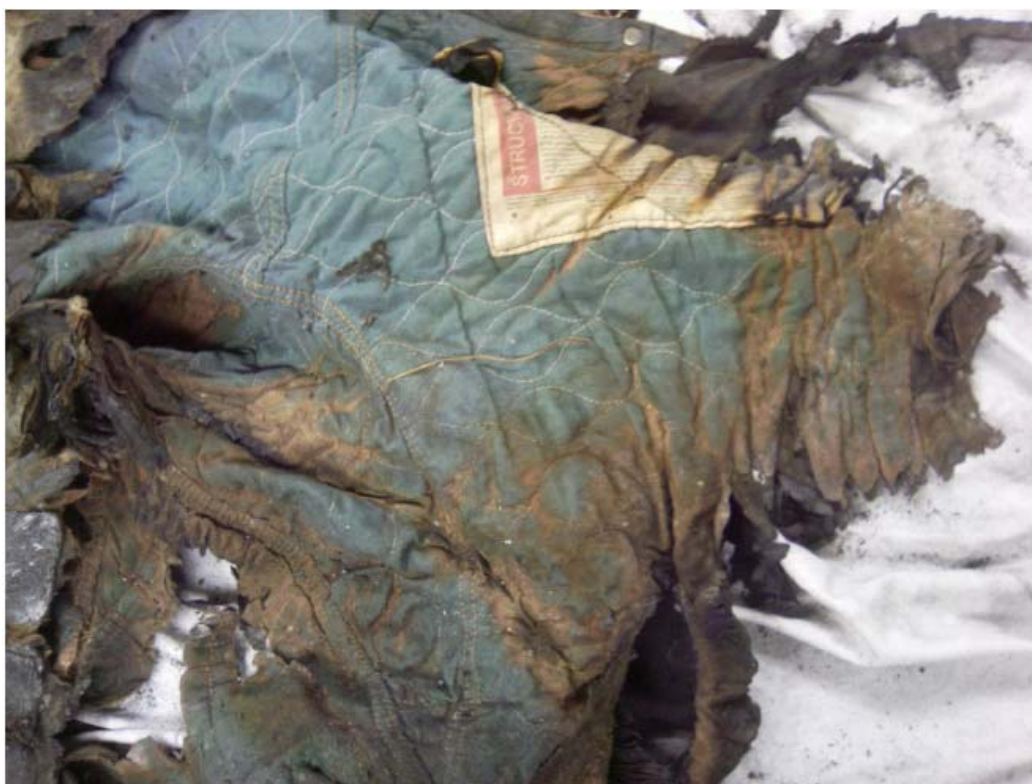
**Schira Pant:**



**What is left of one knee reinforcement. The outer layers completely burned away so had to far exceed 1000 F and this under-layer reached over 750 F**



**Literal thermal destruction of pant throughout most of the garment**



**Inner face cloth areas of discoloration were over 450 to 500 F, and where carbonized exceeded 750 F.**



**Left hip/buttocks area.....complete thermal destruction of Pbi shell requires 1300+ F, and underlying moisture barrier way over 750 F.**



**Note: even where the moisture barrier was completely destroyed the Major B, full fell seam survived when the base fabric didn't**



**Wrinkled areas well over 500 F.....charred and now missing areas over 750 F.**



**Pbi/Kevlar starts to turn to carbon char at 1300 F. Here a significant portion has been partially carbonized and is now gone.**

Schira Helmet



**Trim and ID markers on helmet carbonized. Massive amount of debris, molten carpet, etc. stuck to helmet.**



**Again, Trim and ID markers on helmet carbonized. Massive amount of debris, molten carpet, etc. stuck to helmet.**



**Yet again, Trim and ID markers on helmet carbonized. Massive amount of debris, molten carpet, etc. stuck to helmet.**



**Helmet lay in the fire for so long it burned away the silicone edge beading and portions of the suspension mounting ring.**



**Portion of ear covers carbonized and burned away so Nomex exceeded 750 F.**



**Portion of ear covers carbonized and burned away so Nomex exceeded 750 F.**



**Portion of boots carbonized and the underlying Kevlar liner starting to char so reached around 900 F at the Kevlar layer**



**Portion of boots carbonized and the underlying Kevlar liner starting to char so reached around 900 F at the Kevlar layer**



**Portion of boots carbonized and the underlying Kevlar liner starting to char so reached around 900 F at the Kevlar layer**



**Helmet headband and SCBA face piece after laying in fire.**



SCBA face piece, note carbonized portion of hood that reached in excess of 750 F



**Lenses of goggles completely missing and presumed carbonized / vaporized**



**Helmet suspension intact but laying in fire for extended period finally separated it from the rest of helmet. Separation may have occurred when recovering FF Schira.**



**Pbi blend hood did char but remained intact. Note no charring in the 100% Pbi, ventilated area.**

**Broxterman Coat**



**Serious charring and degradation penetrating all three layers of significant portions of garment as this sleeve shows.**



**Liner face cloth that is only discolored reached 450 to 500 F. Where is carbonized it reached in excessive to 750 F.**



**The 100% Kevlar roping used for the coat Drag Rescue device brined all the way through. Reached well over 900 to 1000 F to do this.**



Significant portions of coat, a greater percentage than on Schira garments, where all three layers were carbonized. Pbi shell at over 1300 F, moisture barrier and liner well over 750 F.

**Broxterman Pants**



**Near complete destruction of garment.**



**Work out pants being worn during the incident were melted and fused to the liner face cloth in areas.**



**Charring shown here on outward facing side of thermal liner indicating it reached at least 750 F**



**Another case of where the Pbi/Kevlar shell just carbonized at 1300+ F. It appears from this photo that the fabric was being put under dimensional stress, and that as the fabric disintegrated it also stretched and that moment in time was preserved.**



Significant portions of garment were virtually destroyed.



**Shell 1330+ F. Moisture barrier way over 750 F. Parts of liner completed charred away, well in excess of 750 F and probably around 1000 F**



**Liner totally carbonized / vaporized...at least 750 F and most likely over 1000 F**

**Broxterman Boots**

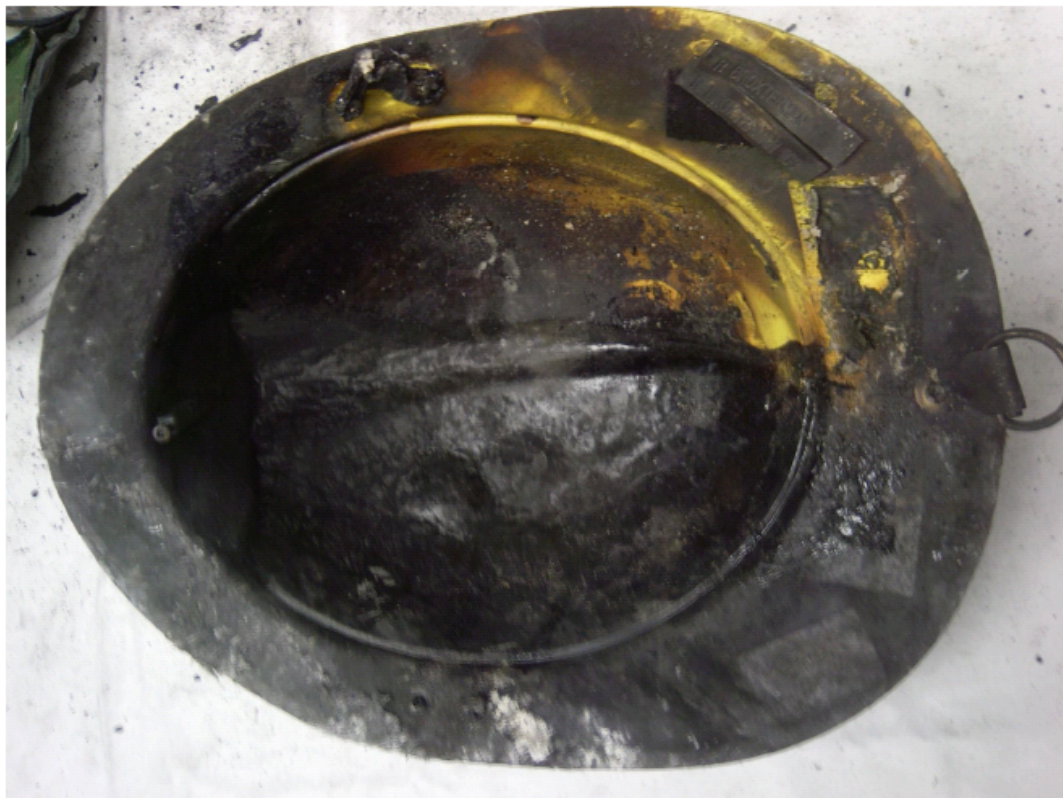


Not a **Honeywell** Brand boots. Similar damage and heat ranges as seen on Schira boots.



Not a **Honeywell** Brand boots. Similar damage and heat ranges as seen on Schira boots.

**Broxterman Helmet**



**Helmet shell lay in direct contact with heat for so long portions of the shell had the resin burned away so had to reach way over 1000 F**



**Helmet shell lay in direct contact with heat for so long portions of the shell had the resin burned away so had to reach way over 1000 F**



**Helmet shell lay in direct contact with heat for so long portions of the shell had the resin burned away so had to reach way over 1000 F**



**More damage to right side than left side**



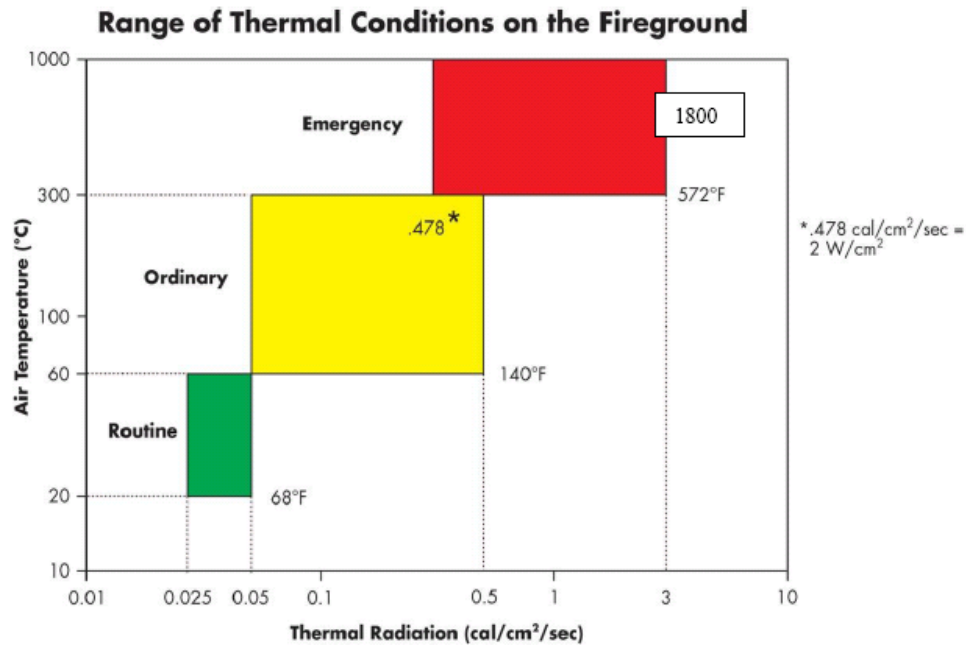
**Right side and front. Helmet shell lay in direct contact with heat for so long portions of the shell had the resin burned away so had to reach way over 1000 F**

**Summary and Analysis:**

It has been documented that fire fighters operate on the fire floor and floors above in three thermal category ranges:

1. The Routine Range from 68F to 140F
2. The Ordinary Range from 141F to 572F
3. The Emergency Range from 573F to 1800 F

## APPENDIX D continued



Since the thermal signatures seen on the garment were in the 450F to 1300+ F range it is felt that fire fighters were exposed at some point, for a significant period of time in the “Emergency Range” of the chart.

The protective envelope performed as designed up to the point the exposure exceeded survivable thermal ranges. As the department already provides the members with state-of-the-art gear that offers the best resistance to thermal degradation that can be purchased, we have no recommendation as to changes the department should consider to make in the PPE specifications.

Prepared by:

Alan Schierenbeck  
**Honeywell First Responder Products**  
(Formerly Total Fire Group)

# **APPENDIX E**

## **MSA Integrated PASS Device Data Log**



## APPENDIX E

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### MSA Integrated PASS Device Data Log



Mine Safety Appliances Company · P.O. Box 427 · Pittsburgh, PA · 15230-0427

October 16, 2009

Brian Kegley  
Colerain Township Department of Fire  
3251 Springdale Road  
Cincinnati, OH 45251

Dear Mr. Kegley,

MSA has reviewed the ICM Tx Integrated PASS devices in an attempt to retrieve the data logs. Below is a brief summary of the two PASS devices:

**PASS Device 1:** The first ICM Tx PASS device shown signs of heat damage but was still functioning. Engineering used a reader/writer to retrieve the data. Attached is the data log from the day in question. The computer log has also been sent to you.

**PASS Device 2:** The second ICM Tx PASS device was burned severely. Engineering attempted to use a reader/writer to retrieve the data but was unsuccessful. The EEPROM IC chip which is where the data log is stored was removed from the printed circuit board (PCB). The EEPROM IC was then placed into a new PCB board to attempt to access the data. The engineer was unable to access the data.

In conclusion, we were only able to retrieve the data from one unit which you were also successful at retrieving. Attempts at the second device were unsuccessful. The two units were sent back to you. I would be pleased to discuss any additional questions or comments regarding the data from the one unit. Please feel free to contact me at [Henry.Fonzi@msanet.com](mailto:Henry.Fonzi@msanet.com) or by phone at (724) 776-7756.

Sincerely,

A handwritten signature in black ink, appearing to read "H. A. Fonzi III".

Henry A. Fonzi III  
Product Line Manager, First Responder SCBA

## APPENDIX E continued



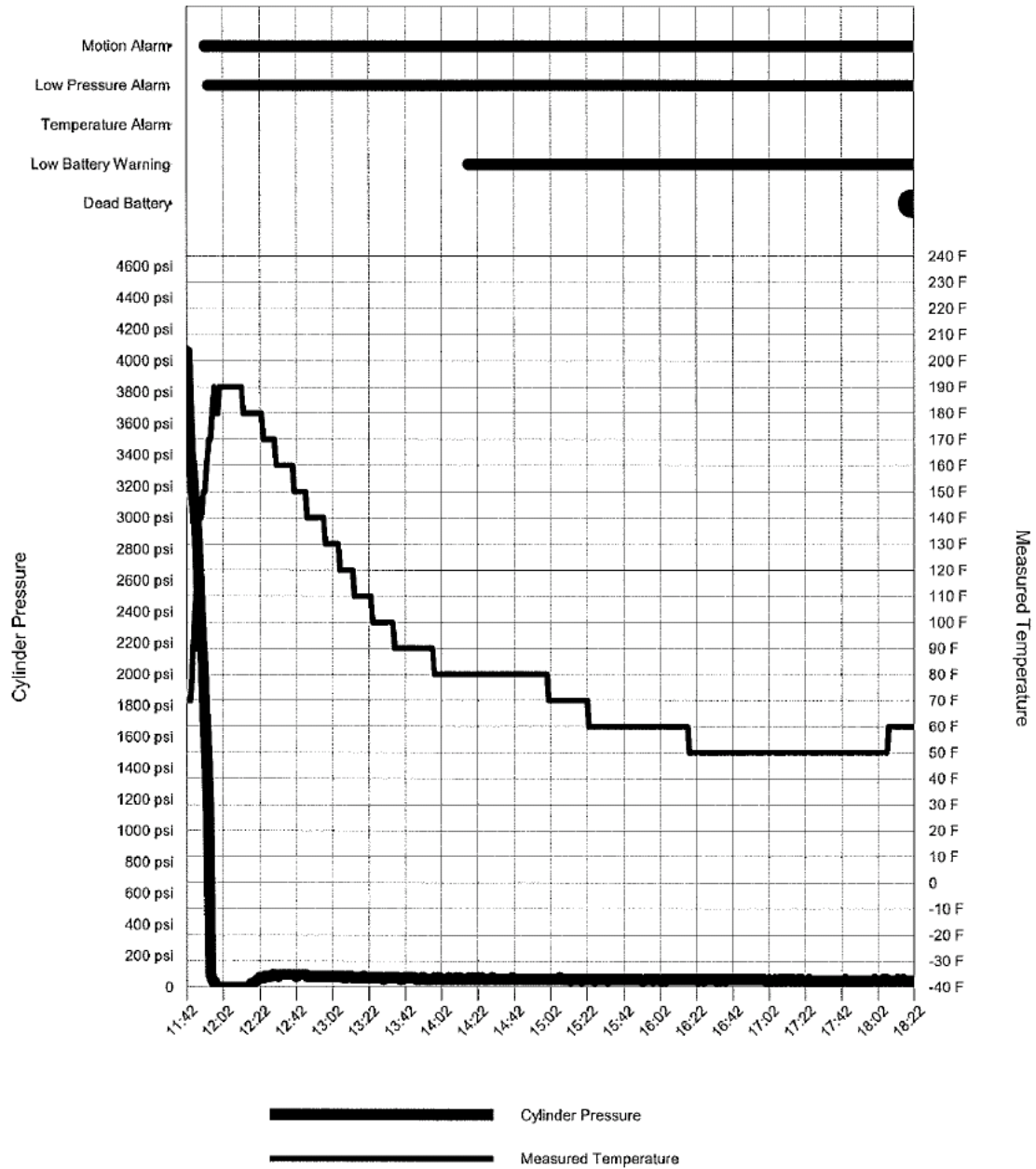
Serial #: 00052229

Cumulative Pressurisations: 223

Instrument Upload Time: 15-Jul-2009 21:41

Cumulative Time: 2622 minutes

Session: 04-Apr-2008 11:42 Duration: 401 minutes Name:



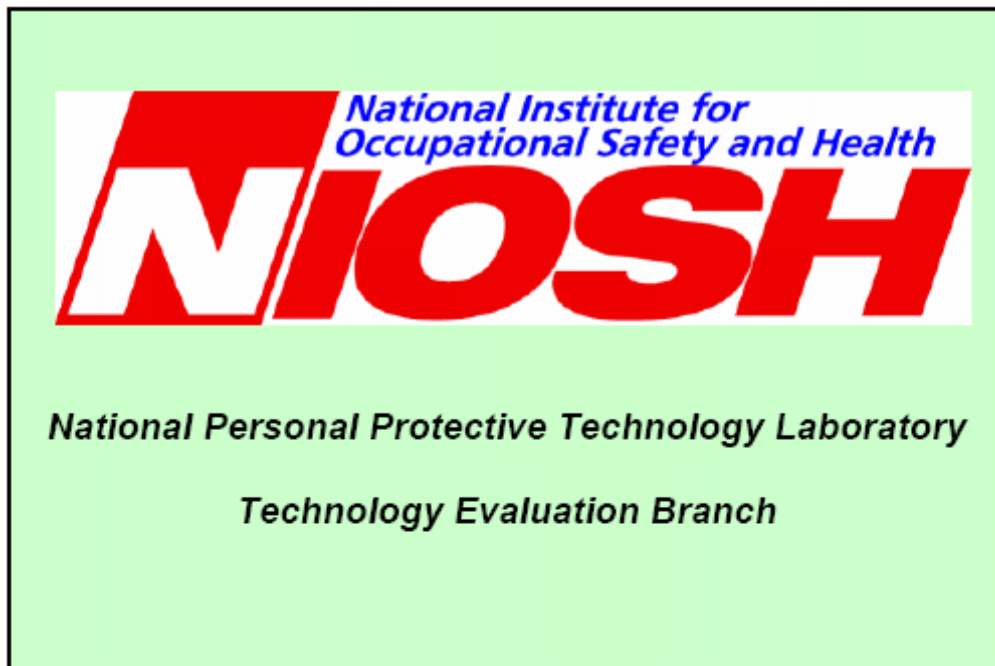
Software: 1.06

# **APPENDIX F**

## **National Institute of Occupational Safety and Health (NIOSH) Self-Contained Breathing Apparatus Report**



**NIOSH Self-Contained Breathing Apparatus Report**



Status Investigation Report of One  
Self-Contained Breathing Apparatus  
Submitted by the  
Colerain Township Fire Department  
Colerain Township, Ohio

NIOSH Task No. TN-16104

September 2, 2009

### **Disclaimer**

The purpose of Respirator Status Investigations is to determine the conformance of each respirator to the NIOSH approval requirements found in Title 42, *Code of Federal Regulations*, Part 84 (42 CFR 84). A number of performance tests are selected from the complete list of Part 84 requirements and each respirator is tested in its “as received” condition to determine its conformance to those performance requirements. Each respirator is also inspected to determine its conformance to the quality assurance documentation on file at NIOSH.

In order to gain additional information about its overall performance, each respirator may also be subjected to other recognized test parameters, such as National Fire Protection Association (NFPA) consensus standards. While the test results give an indication of the respirator’s conformance to the NFPA approval requirements, NIOSH does not actively correlate the test results from its NFPA test equipment with those of certification organizations which list NFPA-compliant products. Thus, the NFPA test results are provided for information purposes only.

Selected tests are conducted only after it has been determined that each respirator is in a condition that is safe to be pressurized, handled, and tested. Respirators whose condition has deteriorated to the point where the health and safety of NIOSH personnel and/or property is at risk will not be tested.

### **Investigator Information**

The SCBA inspection and performance tests were conducted by and this report was written by Vance Kochenderfer, Quality Assurance Specialist, of the Technology Evaluation Branch, National Personal Protective Technology Laboratory, National Institute for Occupational Safety and Health, located in Bruceton, Pennsylvania.

## APPENDIX F continued

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### Status Investigation Report of One Self-Contained Breathing Apparatus Submitted By Colerain Township Fire Department Colerain Township, Ohio

NIOSH Task No. TN-16104

#### Background

As part of the *National Institute for Occupational Safety and Health (NIOSH) Fire Fighter Fatality Investigation and Prevention Program*, the Technology Evaluation Branch agreed to examine and evaluate one Mine Safety Appliances 30 minute, 4500 psi self-contained breathing apparatus (SCBA).

This SCBA status investigation was assigned NIOSH Task Number TN-16104. The Colerain Township Fire Department was advised that NIOSH would provide a written report of the inspections and any applicable test results.

The SCBA, sealed in a corrugated cardboard box, was delivered to the NIOSH facility in Bruceton, Pennsylvania on December 18, 2008. Upon arrival, the sealed package was taken to the Firefighter SCBA Evaluation Lab (Building 108) and stored under lock until the time of the evaluation.

#### SCBA Inspection

The package from the Colerain Township Fire Department was opened and the SCBA inspection was performed on May 22, 2009. The SCBA was inspected by Vance Kochenderfer, Quality Assurance Specialist, of the Technology Evaluation Branch, National Personal Protective Technology Laboratory (NPPTL), NIOSH. The SCBA was examined, component by component, in the condition as received to determine its conformance to the NIOSH-approved configuration. The entire inspection process was videorecorded. The SCBA was identified as a Mine Safety Appliances (MSA) model manufactured under NIOSH approval number TC-13F-475CBRN.

The complete SCBA inspection is summarized in **Appendix I**. The condition of each major component was also photographed with a digital camera. Images of the SCBA are contained in **Appendix IV**.

Overall, the unit is in very good condition but very sooty. The Rapid Intervention Crew/Company (RIC) fitting cover is damaged and was not in place on the fitting. There is dirt in the opening of the RIC fitting itself. In addition, the rubber bumper that the cylinder rests against on the backplate is missing, exposing the metal screw head. It was judged that the SCBA was safe to pressurize and test.

## APPENDIX F continued

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### Personal Alert Safety System (PASS) Device

An ICM 2000 Personal Alert Safety System (PASS) device was incorporated into the pneumatics of the SCBA. As received, the battery was nearly depleted and while the unit could be manually placed in the alarm mode, it did not function in sensing mode. After replacement of the battery, the PASS device was activated both manually and automatically and appeared to function normally. However, it was not tested against the specific performance requirements of NFPA 1982, *Standard on Personal Alert Safety Systems (PASS)*, 1998 Edition. Because NIOSH does not certify PASS devices, no further testing or evaluations were conducted on the PASS unit.

### SCBA Compressed Air Cylinder Contents

During the inspection it was noted that the compressed air cylinder was partially pressurized. An air sample was collected from the cylinder and forwarded to an accredited laboratory for analysis. Lawrence Factor, Inc. analyzed the sample in accordance with the standards and methodologies found in the Compressed Gas Association's standard, ANSI/CGA G-7.1, *Commodity Specification for Air*. The analysis is attached as **Appendix II**.

The test report indicates that the sample met the standard for Grade D air. The sample also met OSHA's moisture content requirement in 29 CFR 1910.134(i)(4)(iii) as well as the more stringent moisture content guidelines published in NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, 2007 Edition.

### SCBA Testing

The purpose of the testing was to determine the SCBA's conformance to the approval performance requirements of Title 42, *Code of Federal Regulations*, Part 84 (42 CFR 84). Further testing was conducted to provide an indication of the SCBA's conformance to the National Fire Protection Association (NFPA) Air Flow Performance requirements of NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services*, 2002 Edition.

**NIOSH SCBA Certification Tests** (in accordance with the performance requirements of 42 CFR 84):

1. Positive Pressure Test [§ 84.70(a)(2)(ii)]
2. Rated Service Time Test (duration) [§ 84.95]
3. Static Pressure Test [§ 84.91(d)]
4. Gas Flow Test [§ 84.93]
5. Exhalation Resistance Test [§ 84.91(c)]
6. Remaining Service Life Indicator Test (low-air alarm) [§ 84.83(f)]

## APPENDIX F continued

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**National Fire Protection Association (NFPA) Tests** (in accordance with NFPA 1981, 2002 Edition):

### 7. Air Flow Performance Test [Chapter 7, 7.1.1]

Testing was conducted on July 22 and August 12, 2009. All testing was videorecorded with the exception of the Exhalation Resistance Test and Static Pressure Test. The SCBA failed to meet the requirements of the Positive Pressure Test. In initial testing, the unit failed the NFPA Air Flow Performance Test because the heads-up display was not functional. However, once the batteries were replaced it passed in a re-test. The unit passed all other tests, which suggests that minor servicing and adjustment would bring it back into full conformance.

**Appendix III** contains the complete NIOSH and NFPA test reports for the SCBA. **Tables One and Two** summarize the NIOSH and NFPA test results.

### Summary and Conclusions

An SCBA was submitted to NIOSH by the Colerain Township Fire Department for evaluation. The SCBA was delivered to NIOSH on December 18, 2008 and inspected on May 22, 2009. The unit was identified as an MSA 30 minute 4500 psi SCBA, NIOSH approval number TC-13F-475CBRN. The unit is sooty but in very good condition overall. The RIC fitting cover is damaged and the fitting opening blocked with dirt. A rubber positioning bumper on the backframe is missing.

The integrated PASS device was activated and appeared to function normally after the depleted battery was replaced. A sample of the air remaining in the cylinder was analyzed and found to meet applicable specifications.

The unit was subjected to performance testing on July 22 and August 12, 2009. After replacement of the heads-up display and PASS device batteries, it met the requirements of all tests except the Positive Pressure Test. Although it did not conform to the specific positive pressure requirement, it appeared to be capable of delivering air to the user.

In light of the information obtained during this investigation, NIOSH has proposed no further action at this time. Following inspection and testing, the SCBA was returned to the package in which it was received and stored under lock in Building 108 at the NIOSH facility in Bruceton, Pennsylvania, pending return to the Colerain Township Fire Department.

If the unit is to be returned to service, it should be cleaned, repaired, and tested by a qualified technician and new batteries installed.



# **Appendix I**

## **SCBA Inspection Report**

## APPENDIX F continued



National Personal Protective Technology Laboratory / Technology Evaluation Branch

### Respirator Field Problem Incoming Inspection Report Summary

<b>Task Number:</b>	TN-16104	<b>Requestor:</b>	Colerain Township Fire Department
<b>Date Received:</b>	18 Dec 2008		
<b>Date Inspected:</b>	22 May 2009	<b>Description:</b>	Injury
<b>Manufacturer:</b>	Mine Safety Appliances	<b>Inspected by:</b>	Vance Kochenderfer
<b>Approval Number:</b>	TC-13F-475CBRN	<b>SCBA Type:</b>	Open Circuit, Pressure-Demand

The SCBA was received in a plastic carrying case contained within a corrugated cardboard box (refer to **Figures 1 through 3 in Appendix IV**).

### Components and Observations

NOTE: All references to "right" or "left" are from the user's perspective.

#### 1. Facepiece (Refer to **Figures 4 through 8 in Appendix IV**):

Ultra Elite model      Part number: 7-935-7

Faceseal:      Size: Medium      Mold date: 4th quarter 2004

Nosecup:      Part number: 7-901-1      Mold date: November 2004

Communications module:      Part number illegible      Serial number: 0047260

- Facepiece lens obscured by soot, visibility poor;
- Lens interior appears clean;
- Lens frame undamaged and securely retains faceseal to lens;
- Rubber faceseal shows no cuts, tears, or deterioration;
- Nosecup properly installed and undamaged, inhalation valves intact;
- Metal tag marked "CTFD 103" attached to facepiece;
- Heads-up display module attached to right side of facepiece, mounting screw slightly loose;
- Communications module attached to left side of facepiece;
- Front plastic housing intact, regulator easily attached and removed;
- Speech diaphragm and microphone installed and undamaged;
- Exhalation valve in place and intact;
- Head harness undamaged, is secured to facepiece, and adjusts freely;
- Neck strap worn but has no cuts and is securely fastened to facepiece;
- Overall condition of facepiece is very good to excellent.

## APPENDIX F continued

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### **2. Air Pressure Regulator** (Refer to Figures 9 through 11 in Appendix IV):

Firehawk CBRN model      Part number: 10047600      Serial number: ANY034019

- Regulator housing worn and scratched but not cracked;
- Bypass valve as received was fully closed, operates properly;
- Donning switch in don mode and operates properly;
- Lower spring latch works normally;
- Sealing gasket to facepiece is slightly dirty but remains intact.

### **3. Low Pressure Regulator Hose** (Refer to Figure 12 in Appendix IV):

- Jacket has no visible cuts or scrapes;
- Hose properly routed through left shoulder strap;
- Connections to regulator and pressure reducer appear secure;
- Snap-Tite quick-disconnect fitting easily released and connected;
- Auxiliary quick-disconnect fitting protected by rubber boot, also operates properly.

### **4. Air Pressure Reducer, RIC Fitting, Audi-Larm Assembly, and Cylinder Connection** (Refer to Figures 13 through 17 in Appendix IV):

Reducer part number illegible

Audi-Larm part number: 10037494

- Reducer securely fastened to backframe, free to slide up and down;
- Reducer very sooty but housing undamaged;
- High-pressure hose covered with braided black fabric jacket, appears undamaged, securely fastened to reducer and Audi-Larm assembly;
- Metal tag on high-pressure hose marked with MSA part number “804382”;
- Protective cap not on RIC fitting, inner stem of cap is bent;
- Some dirt inside RIC fitting opening, would likely prevent connecting mating coupler;
- Audi-Larm housing very sooty but has no apparent damage, bell gong appears secure;
- Interior threads of cylinder connector nut appear clean, o-ring in place and intact.

### **5. Remote Air Pressure Gauge, PASS Device, and Heads-Up Display Transmitter** (Refer to Figures 18 through 21 in Appendix IV):

ICM 2000 PASS model      SEI label attached: NFPA 1982, 1998 Edition

Assembly part number: 7-1219-1      Model number: 10022??9

NightFighter transmitter      Model number: 7-1219-1      Assy. number: 10036995

- Remote gauge visibility fair to poor, indicates empty;
- Hose to pressure reducer covered with black braided fabric jacket; undamaged and securely fastened;
- Hose routed through right shoulder strap and secured with rubber tether;

## APPENDIX F continued

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- As received, PASS can be put in manual alarm mode, but does not operate in sensing mode;
- After replacing battery, PASS device alarm activates both manually and automatically.

### **6. Carrier and Harness Assembly** (Refer to Figures 22 through 26 in Appendix IV):

Part number: 10046847

SEI label attached: NFPA 1981, 2002 Edition

NIOSH approval number: TC-13F-475CBRN

- Plastic backplate is not cracked or damaged;
- NIOSH CBRN approval label affixed to back side;
- Colerain Township property label marked with serial number “04699”;
- Cylinder retention mechanism operates properly;
- Rubber bumper that cylinder rests against is missing, screw head exposed;
- All straps are secured to backplate, only minor wear from use and no signs of heat damage;
- All harness adjustments move freely and hold securely;
- Waistbelt buckle mates easily and holds securely;
- Regulator engages easily to storage point in place on left side of waistbelt.

### **7. Compressed Air Cylinder** (Refer to Figures 27 through 31 in Appendix IV):

DOT exemption: E 11194    Rated pressure: 4500 psi    Serial number: 6235-1868

Manufacture date: December 2004    Made by Carleton Technologies

MSA Stealth H-30, model number: 7-947-1

- Fully-wound composite cylinder;
- Cylinder exterior very sooty; small scratches on surface but none that appear to penetrate into the composite layer;
- Reflective band wrapped around cylinder;
- Rubber valve thread cover attached at cylinder neck;
- Valve gauge visibility fair to poor, indicates 3000 psig;
- Valve fully closed as received, operates easily;
- Cylinder outlet clean and undamaged, minor amount of corrosion on threads;
- Cylinder in very good condition overall.

# **Appendix II**

## **Air Analysis Results**

REC'D 23 JUN 2009 TN-16104

# Air Quality Analysis

The air sample supplied by

**NIOSH/NAPPTL**

TN-16104

PITTSBURGH, PA

has been analyzed by Lawrence Factor, Inc. (an accredited lab - A2LA, ISO/IEC-17025) against the standards and specifications of the Compressed Gas Association, commodity specification for air. No other representations or warranties are expressed or implied other than the analysis results stated below.

**CGA D, NFPA 1500 (G-7.1, '07)**

SUBA43068  
Issue Date - 06/10/09  
Issue ID - 166928  
Kit# - 193341

*Lawrence Factor, Inc.*  
*Director (President)*  
*Robert L. Factor*  
Laboratories



Analytes	Sample	Standard
Oxygen (%)	21.5	19.5-23.5
Carbon Dioxide (ppm)	345.07	1000
Carbon Monoxide (ppm)	<1	10
Water Vapor (ppm)	19.62	24
Dew Point (F)	-67	-65
Oil/Part. (mg/m3)	<1	5
Unknowns	ND	NA
Odor	ND	None

Results: Sample Meets Standard

IMPORTANT: This air/gas or substance was tested ONLY against a specified standard and may contain undetected items which are beyond the purpose or scope of this analysis. More extensive testing can be conducted upon request. This does NOT guarantee the condition nor safe application of the analyzed air/gas or substance. Results reported relate only to the items tested. This report shall not be reproduced except in full, without the written consent of Lawrence Factor, Inc. Methods used: FTIR, electrochemical, microgravimetry, sniffing.

# **Appendix III**

## **SCBA Test Results**

## APPENDIX F continued

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National Personal Protective Technology Laboratory / Technology Evaluation Branch

### SCBA Test Report

Task Number: 16104  
Manufacturer: Mine Safety Appliances  
NIOSH Approval Number: TC-13F-475CBRN  
Tests Performed by: Vance Kochenderfer  
Date of Report: September 2, 2009

#### **I. Background**

On December 18, 2008, one package from the Colerain Township, Ohio Fire Department was delivered to NIOSH. It was taken to the Firefighter Self-Contained Breathing Apparatus (SCBA) Evaluation Lab (building 108) for secured storage. The SCBA was removed from its package and inspected on May 22, 2009. The SCBA inspection process was videorecorded. It was determined that the SCBA was manufactured by Mine Safety Appliances under NIOSH approval number TC-13F-475CBRN. The SCBA was found to be in a condition where it could be safely pressurized and tested. A sample of air remaining in the cylinder was taken on June 4, 2009 and sent to a laboratory for analysis. A series of performance tests was conducted on the SCBA on July 22, 2009. It was noted that the heads-up display, integrated PASS device, and electronic gauge low-air alarm were not functional. The Colerain Township Fire Department requested that NIOSH replace the batteries in these components; this was done and additional testing performed on August 12, 2009. All performance tests, with the exception of the Exhalation Resistance Test and Static Pressure Test, were videotaped. The Positive Pressure Test and Rated Service Time Test are conducted simultaneously.

#### **II. Test Outlines**

##### **A. POSITIVE PRESSURE TEST – NIOSH Test Procedure No. 120**

**42 CFR Part 84 Reference:** Subpart H, § 84.70 (a)(2)(ii)

##### **Requirement:**

*The pressure inside the facepiece in relation to the immediate environment is positive during both inhalation and exhalation.*

##### **Procedure:**

A breathing machine with a 622 kg.-m./min. cam operating at 24 RPM with a 40-liter per minute flow rate (115 liters per minute peak flow) is connected to an anthropometric head

## APPENDIX F continued

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for cycling. A pressure tap in the head is connected to a transducer which in turn is connected to a strip chart recorder for determining the pressure in the facepiece.

**Results** – Tested on July 22, 2009 with SCBA in as-received condition. The inhalation breathing resistance dropped below ambient during the test. The SCBA **did not** meet the test requirement.

Inhalation Breathing Resistance:    -0.15    INWC
---

### B. RATED SERVICE TIME TEST – NIOSH Test Procedure No. 121

**42 CFR Part 84 Reference:** Subpart F, § 84.53 (a) and Subpart H, § 84.95 (a) and (b)

**Requirement:**

*Service time will be measured while the apparatus is operated by a breathing machine as described in § 84.88. The open-circuit apparatus will be classified according to the length of time it supplies air or oxygen to the breathing machine. Classifications are listed in § 84.53.*

**Procedure:**

A breathing machine with a 622 kg.-m./min. cam operating at 24 RPM with a 40 liters per minute flow rate is connected to an anthropometric head for cycling. A pressure tap in the head is connected to a transducer which in turn is connected to a strip chart recorder for determining the pressure in the facepiece. The breathing machine is run until the inhalation portion of the breathing curve falls below the minimum requirement.

**Results** – Tested on July 22, 2009 with SCBA in as-received condition. The measured service time (adjusted to correspond with the recorded breathing cycles) was more than the rated service time of 30 minutes. The SCBA passed the test requirement.

Measured Service Time:    33    Minutes    55    Seconds
--

### C. STATIC PRESSURE TEST – NIOSH Test Procedure No. 122

**42 CFR Part 84 Reference:** Subpart H, § 84.91 (d)

**Requirement:**

*The static pressure (at zero flow) in the facepiece shall not exceed 38 mm. (1.5 inches) water-column height.*

**Procedure:**

The facepiece is fitted to an anthropometric head for testing. A pressure tap in the head is connected to a calibrated manometer. Full cylinder pressure is applied to the unit at zero flow and a reading from the manometer is recorded.

## APPENDIX F continued

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**Results** – Tested on July 22, 2009 with SCBA in as-received condition. The unit met the test requirement.

Facepiece Static Pressure:	0.70	INWC
----------------------------	------	------

### D. GAS FLOW TEST – NIOSH Test Procedure No. 123

**42 CFR Part 84 Reference:** Subpart H, § 84.93 (b) and (c)

**Requirement:**

*The flow from the apparatus shall be greater than 200 liters per minute when the pressure in the facepiece of demand apparatus is lowered by 51 mm. (2 inches) water column height when full container pressure is applied. Where pressure demand apparatus are tested, the flow will be measured at zero gage pressure in the facepiece.*

**Procedure:**

A pressure tap in the anthropometric head is connected to a manometer for determining when the pressure inside the facepiece is at zero. A mass flow meter is connected in line between the anthropometric head and an adjustable vacuum source to measure flow. The SCBA cylinder is replaced by a test stand which is adjusted initially to full cylinder pressure. The vacuum source is adjusted during the test to maintain the desired pressure inside the facepiece. Once the proper facepiece pressure has stabilized, a flow reading is recorded. The procedure is then repeated with the test stand adjusted to 500 psig.

**Results** – Tested on July 22, 2009 with SCBA in as-received condition. The SCBA met the test requirement at both supply pressures.

Applied pressure	Flow
4500 psig	278 liters per minute
500 psig	255 liters per minute

### E. EXHALATION RESISTANCE TEST – NIOSH Test Procedure No. 122

**42 CFR Part 84 Reference:** Subpart H, § 84.91 (c)

**Requirement:**

*The exhalation resistance of pressure-demand apparatus shall not exceed the static pressure in the facepiece by more than 51 mm. (2 inches) water-column height.*

**Procedure:**

The facepiece is mounted on an anthropometric head form. A probe in the head form is connected to a slant manometer for measuring exhalation breathing resistance. The air flow through the apparatus is adjusted to a rate of 85 liters per minute and the exhalation resistance is recorded.

## APPENDIX F continued

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**Results** – Tested on July 22, 2009 with SCBA in as-received condition. The unit passed the requirement.

Exhalation Breathing Resistance:	1.65	INWC
Static Pressure:	0.70	INWC
Difference:	0.95	INWC

### **F. REMAINING SERVICE LIFE INDICATOR TEST – NIOSH Test Procedure No. 124** **42 CFR Part 84 Reference:** Subpart H, § 84.83 (f) and Subpart G, § 84.63 (c)

#### **Requirement:**

*Each remaining service life indicator or warning device shall give an alarm when the remaining service life of the apparatus is reduced within a range of 20 to 25 percent of its rated service time or pressure.*

This requirement is modified under § 84.63(c) as follows: *For apparatus which do not have a method of manually turning off remote gage in the event of a gage or gage line failure the remaining service life indicator is required to be set at  $25\% \pm 2\%$  of the rated service time or pressure.*

#### **Procedure:**

A calibrated gauge is connected in line between the air supply and the first-stage regulator. The unit is then allowed to gradually bleed down. When the low-air alarm is activated, the pressure on the gauge is recorded. This procedure is repeated six times. The average of the six readings is calculated and recorded.

**Results** – This SCBA contains three alarms: a bell, an electronic gauge, and a facepiece-mounted heads-up display. As this SCBA does not have a remote gauge shutoff, the test requirement is  $25\% \pm 2\%$ .

Unit was tested on July 22, 2009 in as-received condition. The bell alarm activated within the required range (between 1035 and 1215 psig). The electronic gauge and heads-up display alarms were not functional. At the request of the Colerain Township Fire Department, the batteries in the gauge and heads-up display were replaced and these alarms tested on August 12, 2009. Both alarms then met the test requirement.

## APPENDIX F continued

Run #	Bell Alarm Point (psig)	Electronic Alarm Point (psig)	Heads-Up Display Alarm Point (psig)
1.	1120	1130	1130
2.	1115	1130	1145
3.	1115	1130	1100
4.	1125	1135	1140
5.	1115	1130	1140
6.	1115	1140	1140
Avg.	<b>1118</b>	<b>1133</b>	<b>1133</b>

### G. NFPA AIR FLOW PERFORMANCE TEST

**NFPA 1981 (2002 Edition) Reference:** Chapter 7, Performance Requirements, Sec. 7.1.1

#### **Requirement:**

*SCBA shall be tested for air flow performance as specified in Section 8.1, Air Flow Performance Test, and the SCBA facepiece pressure shall not be less than 0.0 mm (0.0 in.) water column and shall not be greater than 89 mm (3½ in.) water column above ambient pressure from the time the test begins until the time the test is concluded.*

#### **Procedure:**

A breathing machine as specified in Section 8.1.4 operating at  $30 \pm 1$  breaths/min with a  $103 \pm 3$  L/min flow rate is connected to an anthropometric head for cycling. A pressure tap in the head is connected to a transducer which in turn is connected to a flatbed chart recorder for determining the pressure in the facepiece.

**Results** – Unit was tested on July 22, 2009 in as-received condition. This test relies on the proper functioning of all low-air alarms on the SCBA. The electronic gauge and heads-up display were not functional during this run; therefore, the test was run until the cylinder was exhausted, at which point the facepiece pressure dropped below ambient. Prior to cylinder exhaustion, the minimum facepiece pressure was 0.20 INWC. The unit **did not** meet the requirement during initial testing.

Maximum Facepiece Pressure:	<b>2.25</b> INWC
Minimum Facepiece Pressure:	<b>n/a</b> INWC

At the request of the Colerain Township Fire Department, the batteries in the gauge and heads-up display were replaced and the test re-run on August 12, 2009. In this condition, the SCBA met the NFPA test requirements.

Maximum Facepiece Pressure:	<b>2.30</b> INWC
Minimum Facepiece Pressure:	<b>0.20</b> INWC

## APPENDIX F continued

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### **III. Disposition:**

Following testing, the SCBA was returned to the package in which it was shipped to NIOSH pending return to the Colerain Township Fire Department.

**The results of all tests are summarized in Tables One and Two which follow.**

## APPENDIX F continued

**TABLE ONE – Summary of NIOSH Test Results**

**Task Number:** 16104  
**Manufacturer:** Mine Safety Appliances  
**NIOSH Approval Number:** TC-13F-475CBRN  
**Tests Performed By:** Vance Kochenderfer  
**Dates of Tests:** July 22 and August 12, 2009

TEST / 42 CFR PART 84 REFERENCE	STANDARD	RESULT	PASS	FAIL
<b>A. POSITIVE PRESSURE TEST</b> Reference: Subpart H, § 84.70 (a)(2)(ii)	$\geq 0.00$ INWC	-0.15 INWC		<b>X</b>
<b>B. RATED SERVICE TIME TEST</b> Reference: Subpart F, § 84.53 (a), Subpart H, § 84.95 (a) and (b)	$\geq 30$ min.	33 min, 55 s	<b>X</b>	
<b>C. STATIC PRESSURE TEST</b> Reference: Subpart H, § 84.91 (d)	$\leq 1.50$ INWC	0.70 INWC	<b>X</b>	
<b>D. GAS FLOW TEST (at Full Cylinder Pressure)</b> Reference: Subpart H, § 84.93 (b) and (c)	$\geq 200$ lpm	278 lpm	<b>X</b>	
<b>D. GAS FLOW TEST (at 500 psig)</b> Reference: Subpart H, § 84.93 (b) and (c)	$\geq 200$ lpm	255 lpm	<b>X</b>	
<b>E. EXHALATION RESISTANCE TEST</b> Reference: Subpart H, § 84.91 (c)	Difference $\leq 2.00$ INWC	0.95 INWC	<b>X</b>	
<b>F. REMAINING SERVICE LIFE INDICATOR TEST (bell alarm)</b> Reference: Subpart H, § 84.83 (f) and Subpart G, § 84.63 (c)	Between 1035 and 1215 psig	1118 psig	<b>X</b>	
<b>F. REMAINING SERVICE LIFE INDICATOR TEST (electronic gauge)</b> Reference: Subpart H, § 84.83 (f) and Subpart G, § 84.63 (c)	Between 1035 and 1215 psig	1133 psig	<b>X</b>	
<b>F. REMAINING SERVICE LIFE INDICATOR TEST (heads-up display)</b> Reference: Subpart H, § 84.83 (f) and Subpart G, § 84.63 (c)	Between 1035 and 1215 psig	1133 psig	<b>X</b>	

**NOTE: The Positive Pressure Test and Rated Service Life Test are run simultaneously.**

## APPENDIX F continued

**TABLE TWO – Summary of NFPA Test Results**

**Task Number:** 16104  
**Manufacturer:** Mine Safety Appliances  
**NIOSH Approval Number:** TC-13F-475CBRN  
**Tests Performed By:** Vance Kochenderfer  
**Dates of Tests:** July 22 and August 12, 2009

TEST / REFERENCE	STANDARD	RESULT	PASS	FAIL
<b>G. NFPA AIR FLOW PERFORMANCE</b> (as-received test) Reference: NFPA 1981 (2002 Edition), Section 7.1.1	$\leq 3.50$ INWC Exhalation Resistance	2.25 INWC	X	
<b>G. NFPA AIR FLOW PERFORMANCE</b> (as-received test) Reference: NFPA 1981 (2002 Edition), Section 7.1.1	$\geq 0.00$ INWC Inhalation Resistance	Cylinder exhausted		X
<b>G. NFPA AIR FLOW PERFORMANCE</b> (re-test after battery replacement) Reference: NFPA 1981 (2002 Edition), Section 7.1.1	$\leq 3.50$ INWC Exhalation Resistance	2.30 INWC	X	
<b>G. NFPA AIR FLOW PERFORMANCE</b> (re-test after battery replacement) Reference: NFPA 1981 (2002 Edition), Section 7.1.1	$\geq 0.00$ INWC Inhalation Resistance	0.20 INWC	X	

## APPENDIX F continued

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# **Appendix IV**

## **Images**

## APPENDIX F continued

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National Personal Protective Technology Laboratory / Technology Evaluation Branch

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### IMAGES

One Self-Contained Breathing Apparatus  
Submitted by the Colerain Township Fire Department  
Colerain Township, Ohio

NIOSH Task No. TN-16104

#### *List of Figures:*

- Figure 1: Package as Received from the Colerain Township Fire Department
- Figure 2: SCBA in Plastic Carrying Case
- Figure 3: SCBA Ready for Inspection
- Figure 4: Facepiece
- Figure 5: Visibility through Facepiece Lens
- Figure 6: Communications Module on Left of Facepiece
- Figure 7: Heads-Up Display on Right of Facepiece
- Figure 8: Metal Tag Attached to Facepiece
- Figure 9: Regulator
- Figure 10: Rear View of Regulator
- Figure 11: Side View of Regulator
- Figure 12: Low-Pressure Hose Quick Disconnect
- Figure 13: Pressure Reducer
- Figure 14: RIC Fitting
- Figure 15: RIC Fitting Cover
- Figure 16: Audi-Larm Assembly
- Figure 17: Cylinder Connector Nut
- Figure 18: Heads-Up Display Transmitter
- Figure 19: Rear View of Heads-Up Display Transmitter
- Figure 20: Remote Air Pressure Gauge/PASS Device
- Figure 21: Rear View of Remote Air Pressure Gauge/PASS Device
- Figure 22: Carrier and Harness Assembly
- Figure 23: NIOSH Approval Label
- Figure 24: NIOSH CBRN Approval Label
- Figure 25: NFPA Certification Label
- Figure 26: Colerain Township Property Label
- Figure 27: Cylinder
- Figure 28: Cylinder
- Figure 29: Cylinder DOT Label
- Figure 30: Cylinder Valve
- Figure 31: Cylinder Valve Outlet

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Colerain Township Fire Department – Images – Page 1

## APPENDIX F continued

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Figure 1 – Package as Received from the Colerain Township Fire Department



Figure 2 – SCBA in Plastic Carrying Case



## APPENDIX F continued

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Figure 3 – SCBA Ready for Inspection



Figure 4 – Facepiece



## APPENDIX F continued

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Figure 5 – Visibility through Facepiece Lens



Figure 6 – Communications Module on Left of Facepiece



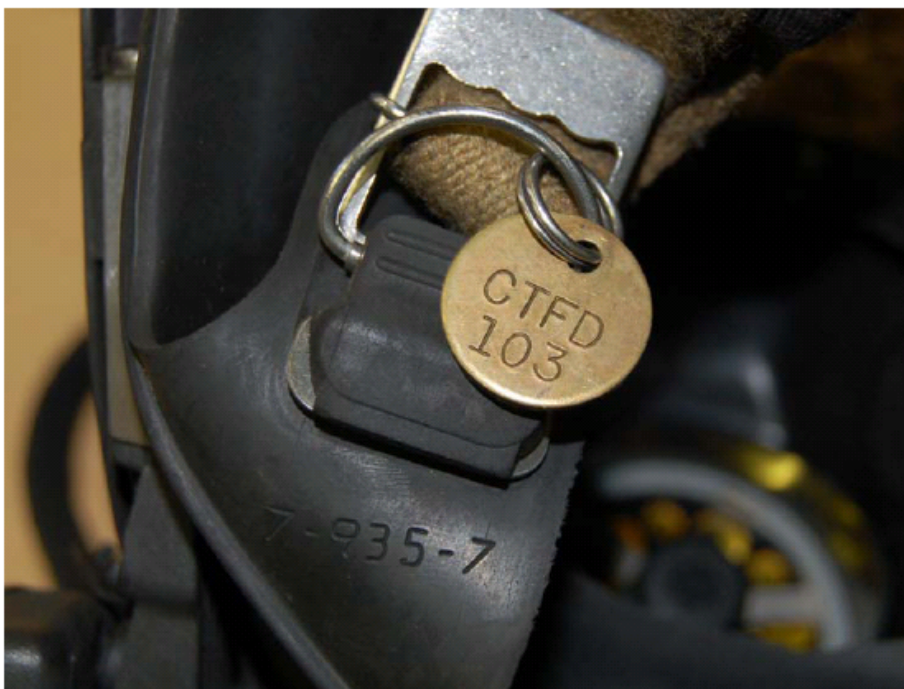
## APPENDIX F continued

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Figure 7 – Heads-Up Display on Right of Facepiece



Figure 8 – Metal Tag Attached to Facepiece



## APPENDIX F continued

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Figure 9 – Regulator



Figure 10 – Rear View of Regulator



## APPENDIX F continued

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Figure 11 – Side View of Regulator

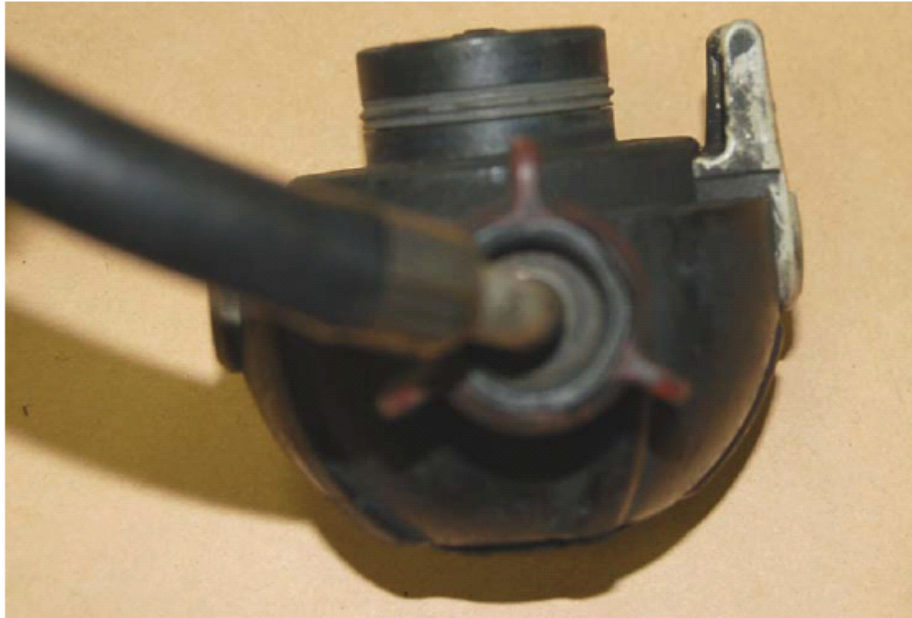
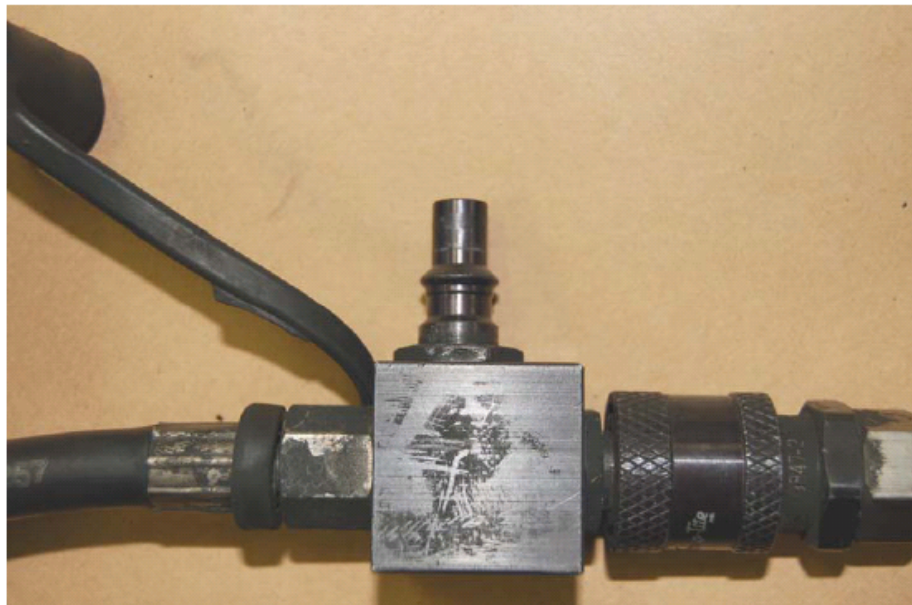


Figure 12 – Low-Pressure Hose Quick Disconnect



## APPENDIX F continued

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Figure 13 – Pressure Reducer



Figure 14 – RIC Fitting



## APPENDIX F continued

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Figure 15 – RIC Fitting Cover



Figure 16 – Audi-Larm Assembly



## APPENDIX F continued

---

Figure 17 – Cylinder Connector Nut



Figure 18 – Heads-Up Display Transmitter



## APPENDIX F continued

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Figure 19 – Rear View of Heads-Up Display Transmitter



Figure 20 – Remote Air Pressure Gauge/PASS Device



## APPENDIX F continued

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Figure 21 – Rear View of Remote Air Pressure Gauge/PASS Device



Figure 22 – Carrier and Harness Assembly



## APPENDIX F continued

Figure 23 – NIOSH Approval Label

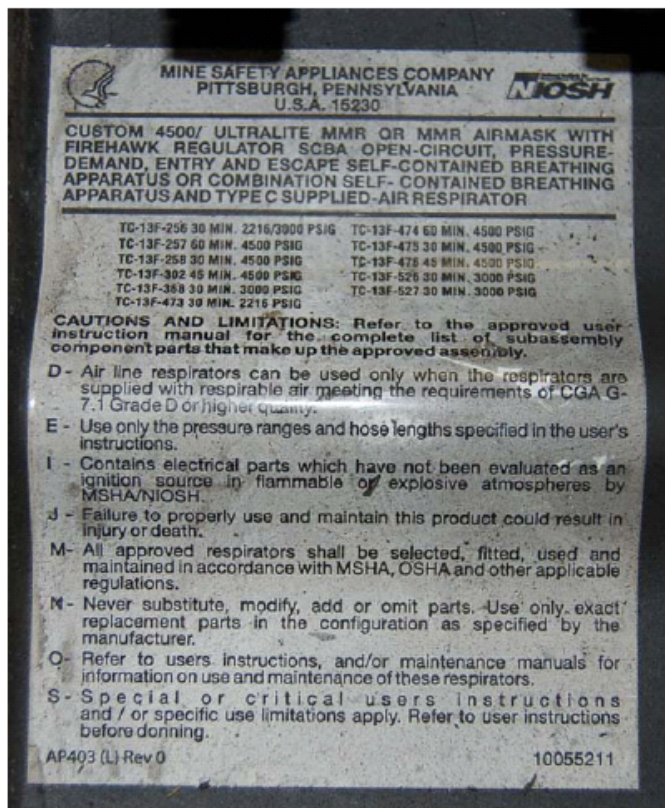
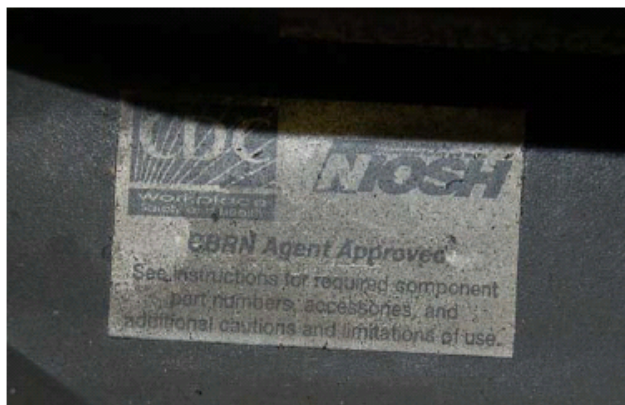


Figure 24 – NIOSH CBRN Approval Label



## APPENDIX F continued

Figure 25 – NFPA Certification Label

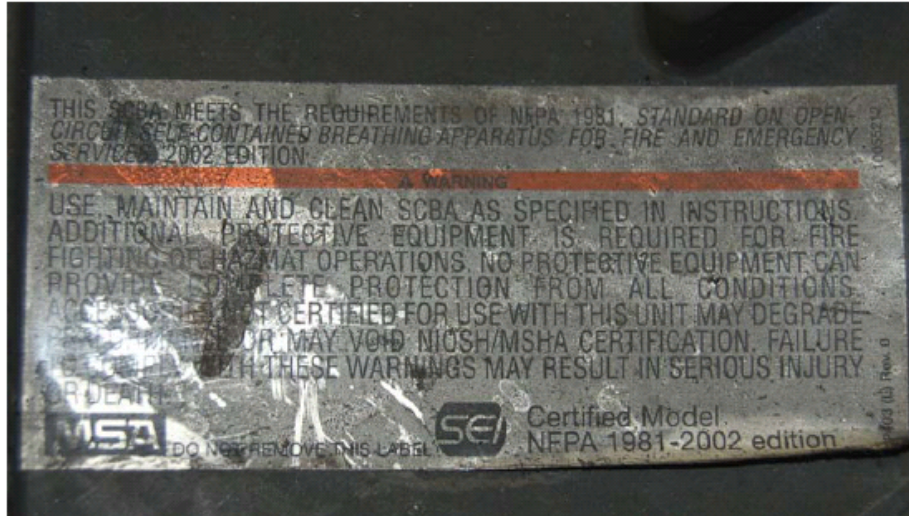


Figure 26 – Colerain Township Property Label



## APPENDIX F continued

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Figure 27 – Cylinder



Figure 28 – Cylinder

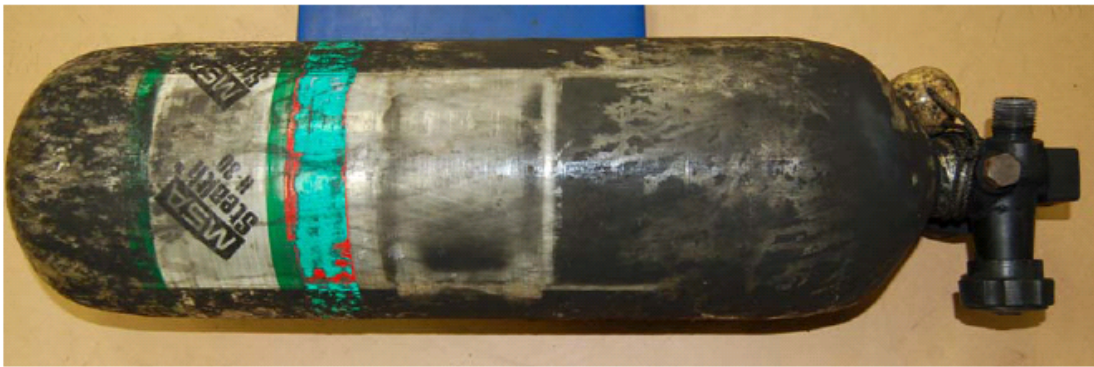


Figure 29 – Cylinder DOT Label



Figure 30 – Cylinder Valve



Figure 31 – Cylinder Valve Outlet






# **APPENDIX G**

## **Pre-Incident Apparatus Pump Test Results**



# APPENDIX G

## Pre-Incident Apparatus Pump Test Results



**Vogelpohl Fire Equipment, Inc**

2770 Circleport Drive Erlanger, KY 41018 859-282-1000 800-797-8317

---

### ANNUAL PUMP TEST

**FIRE DEPARTMENT** Colerain Twp. Fire Dept.

**UNIT NUMBER** 208

**TEST LOCATION** Colerain Maint. Shop

**RATED PUMP CAPACITY** 1000 gpm

**MILEAGE** Cab changed

**HOURS** Cab changed

**DATE** 11/15/2007

---

**MANUFACTURER** E-One

**CHASSIS MFG** Ford

**ENGINE MFG** Cat

**PUMP MFG** Hale

**GEAR RATIO ENGINE TO PUMP**

**SUCTION HOSE SIZE** 6

**ENGINE TEMP** 170

**MODEL** C8000

**MODEL** 3208 TA

**MODEL** QST 100 2

**SO#** 3202

**SERIAL** 1FDYD80U9EVA08175

**SERIAL** 2205198

**SERIAL** 4952T

**ELEVATION OF TEST SITE**

**LENGTH** 20

**OIL PRESSURE** 100

---

**PUMP ELEV ABOVE WATER SOURCE** 4

**AMBIENT AIR TEMP** 44

**WATER TEMP** 44

**PUMP PRIME TIME** 10seconds

---

**Dry Vacuum Test** 2.5 in. Hg Drop In 5 Min. (10 in. Max)

Passed ☒ Failed ☐ Vacuum Test

---

Test Conditions	Pump Control Position	Flow GPM	Pitot PSI	Test Gauge PSI	Suction Allowance PSIG (NEG)	Net Pump PSI	Engine Speed	Pump Speed
Capacity								
150 psi - 20 minutes	Single	1004	70	150	3	153	2100	
70% Capacity								
200 psi - 10 minutes	Single	701	34	200	1	201	2250	
50% Capacity								
250 psi - 10 minutes	Single	501	20	250	1	251	2475	

---

**Automatic Pressure Control Test:**

20	15	15
90 psi	150 psi	250 psi
PSI Increase		

---

Technician *Chad Johnson*

\*\* Please see attached sheet for defective items found on apparatus \*\*

## APPENDIX G

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# **APPENDIX H**

## **Post-incident Apparatus Pump Test Results**



# APPENDIX H

## Post-incident Apparatus Pump Test Results



**Vogelpohl Fire Equipment, Inc**

2770 Circleport Drive  
Erlanger, KY 41018  
859-282-1000  
800-797-8317

### ANNUAL PUMP TEST

**FIRE DEPARTMENT** Colerain Twp

**UNIT NUMBER** 208

**TEST LOCATION** Colerain Maint. Garage

**RATED PUMP CAPACITY** 1000 gpm

**MILEAGE** 160,350

**HOURS** 2003 (Pump)

**DATE** 4/6/2008

**MANUFACTURER** Emergency One

**CHASSIS MFG** Ford

**ENGINE MFG** Catepillar

**PUMP MFG** Hale

**GEAR RATIO ENGINE TO PUMP** 1 - 1.86

**SUCTION HOSE SIZE** 6 in **LENGTH** 20 ft

**ENGINE TEMP** 195 **OIL PRESSURE** 75 **PUMP ELEV ABOVE WATER SOURCE** 3 ft

**MODEL** Commercial Pump

**MODEL** 8000

**MODEL** 3208

**MODEL** QSF100-2

**ELEVATION OF TEST SITE** 49521

**SERIAL** E-1-3302

**SERIAL** 1FDYD80U9EVA081

**SERIAL** 02Z05198

**SERIAL** 49521

**AMBIENT AIR TEMP** 42 **WATER TEMP** 55

**PUMP PRIME TIME** 14 seconds

**Dry Vacuum Test** 6 in. Hg Drop In 5 Min. (10 in. Max)

**Passed** ☒ **Failed** ☐ **Vacuum Test**

Test Conditions	Pump Control Position	Flow GPM	Pitot PSI	Test Gauge PSI	Suction Allowance PSIG (NEG)	Net Pump PSI	Engine Speed	Pump Speed
Capacity								
150 psi - 20 minutes	N/A	1003	70	147	3	150	2000	3720
70% Capacity								
200 psi - 10 minutes	N/A	701	58	198	2	200	2200	4092
50% Capacity								
250 psi - 10 minutes	N/A	501	58	248	2	250	2450	4557

**Automatic Pressure Control Test:**

0 psi 5 psi 2 psi

**PSI Increase** 250 psi

**Technician** Charlie Day

\*\* Please see attached sheet for defective items found on apparatus \*\*