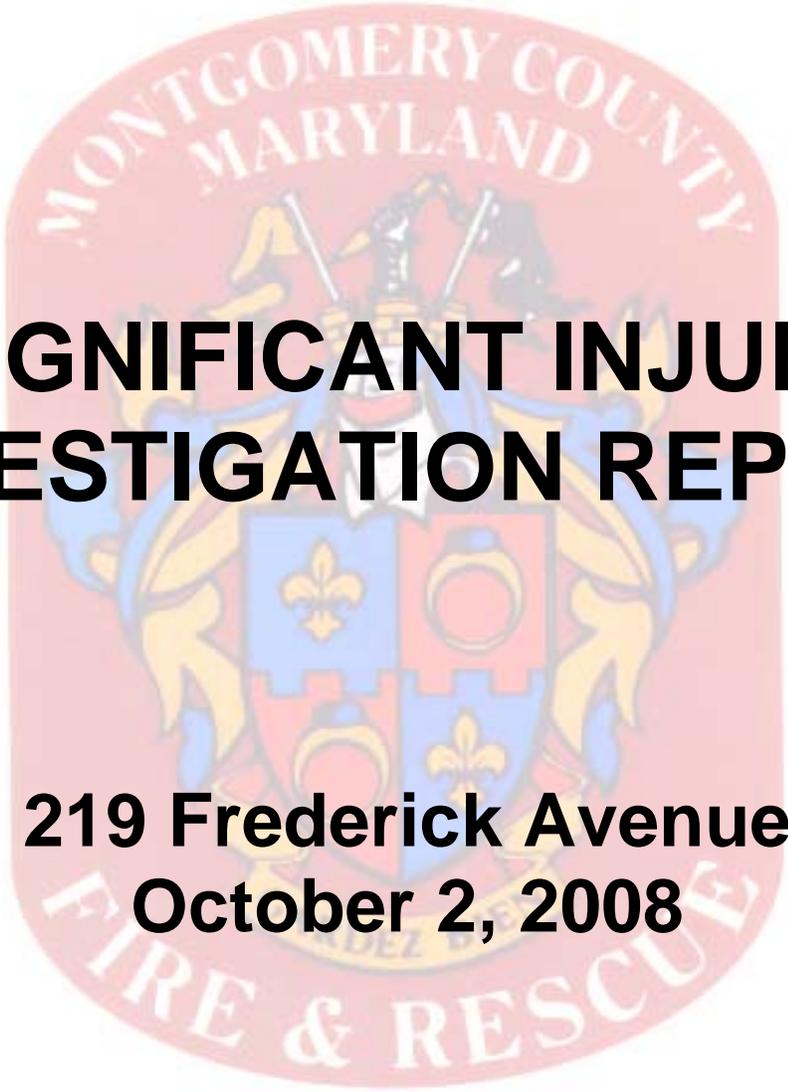


Montgomery County Fire and Rescue Service

The logo of Montgomery County Fire & Rescue Service is a circular emblem. It features a central shield with a blue top section containing a yellow fleur-de-lis, and a red bottom section containing a yellow gear. The shield is flanked by two yellow lions. Above the shield is a blue banner with a yellow border. The entire emblem is set against a red background. The text "MONTGOMERY COUNTY MARYLAND" is written in white, uppercase letters along the top arc of the circle, and "FIRE & RESCUE" is written in white, uppercase letters along the bottom arc.

SIGNIFICANT INJURY INVESTIGATION REPORT

**219 Frederick Avenue
October 2, 2008**

April 2009

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Acknowledgements

The Significant Injury Investigation Group (SIIG) is grateful to all those who participated in the development of this *Report*. This *Report* would not have been possible without their cooperation and assistance.

The SIIG appreciated the willingness of all the members of the Montgomery County Fire and Rescue Service participate in and provide data for the post-incident review.

The SIIG especially thanks the crews from Fire Stations 3, 18 and 23 for their assistance during the course of the investigation with post-incident site visits.

Specifically, the SIIG would like to recognize the following individuals and organizations for their support and contributions to this *Report*:

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Captain Chris Stroup
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Fire Modeling Team

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Fire Protection Engineer Patsy Warnick
Fire Protection Engineer (Intern) Adam St. John

Fairfax County Fire and Rescue Department

Chief Ronald L. Mastin
Lieutenant Paul Bull - SCBA Shop
Mr. Eugene W Beach - SCBA Shop

Loudoun County Department of Fire, Rescue and Emergency Management

Chief Joseph E. Pozzo
Mr. Bill McGann, Member Loudoun County Fire & Rescue Commission

Prince William County Department of Fire and Rescue

Chief Kevin McGee
Battalion Chief Jennie Collins

Others

Mr. Jeffrey Stull, International Personnel Protection, Inc.

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Mr. Bob Duval, National Fire Protection Association

SIIG Meeting Facility

The SIIG appreciates the use of the Alternate Emergency Communications Center as the primary meeting location. The facility was offered by Battalion Chief William Kang and logistical support was provided by Michael Kelly and the Kensington Volunteer Fire Department.

The SIIG also appreciates the support of the many other Montgomery County Fire and Rescue Service personnel who assisted by taking on additional responsibilities so SIIG members could focus on this *Report*.

The SIIG was comprised of six members that represented the Department as well as a fire rescue member from outside Montgomery County.

Montgomery County Fire and Rescue Service

Assistant Chief Scott Goldstein, Division of Operations, SIIG Chair
Chief Buddy Sutton, Laytonsville District VFD
Deputy Chief Craig Lazar, Rockville VFD, MCVFRA
Assistant Chief Michael Nelson, Safety Section
Captain Gary Rebsch, Local 1664

Loudoun County Department of Fire, Rescue & Emergency Management

Deputy Chief Keith Brower

Executive Summary

At 0127 hours on October 2, 2008, the Montgomery County Fire and Rescue Services (MCFRS) Emergency Communications Center (ECC) alerted Station 3 of a transformer fire in the area of 222 Frederick Avenue in Rockville. Upon arrival, Engine 703 discovered a fire in the basement of a house located at 219 Frederick Avenue and requested the full structure fire assignment be dispatched.

During firefighting operations, a fire fighter from Rescue Squad 703 fell into the basement through a hole in the first floor dining area. The bedroom below the dining room had been engulfed in flame just seconds before the structural collapse. A Mayday operation was initiated. The fire fighter was able to perform a "fire fighter self rescue." The fire fighter was transported to the burn unit at Washington Hospital Center with 35% total body surface burned.

Given the severity of the injuries and magnitude of the event, a Significant Injury Investigation Group (SIIG) was assembled to review the incident.

The SIIG was tasked to obtain all available incident facts/information and communicate a detailed validated factual incident review report to the Montgomery County Fire and Rescue Service. The scope of the report is the factual documentation of the events leading up to the incident, the incident operations, the fire fighter mayday, and the incident mitigation (including treatment and transport of the injured fire fighter). The results of findings will be used as lessons learned for the Montgomery County Fire and Rescue Service, the State and the National Fire Service.

The Montgomery County Fire/Explosive Investigations Office performed a separate, independent investigation to determine origin and cause of the Frederick Avenue incident.

This *Significant Injury Investigation Report* presents the results of the SIIG's comprehensive review and analysis of the incident. All of the information presented is factual and was validated by multiple sources prior to inclusion in this document. It is important to note that the SIIG had the advantage to retrospectively review the incident over months and develop recommendations. In contrast, the first fire fighters to arrive on the scene were confronted with a different type of incident than they were dispatched for and were required to react and make critical decisions and take action in minutes.

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The SIIG determined that several major factors adversely affected the sequence of events on Frederick Avenue, including:

- Fire ground Operations
- Accountability/Crew Integrity
- Communications
- Mayday Policy, Procedures, and Process
- Personnel Training and Certification
- Equipment Issues

The review of this event highlights multiple operational and administrative deficiencies that contributed to the chain of events that lead to the significant injury of a fire fighter. The singular occurrence of one deficiency and even multiple occur on each and every event. A fire ground injury or death occurs when multiple deficiencies add up and overwhelm the incident dynamics.

The SIIG hopes that all Montgomery County Fire and Rescue Service personnel, as well as personnel in the Washington DC region and nationally, take the opportunity to learn from the issues and recommendations identified in the *Significant Injury Investigation Report*.

Introduction

This *Significant Injury Investigation Report* (SIIR) is a comprehensive and factual review of the response to the October 2, 2008 fire incident on Frederick Avenue. Specifically, the SIIG was asked to:

Obtain all available incident facts/information and communicate a detailed validated factual incident review report to the Montgomery County Fire Rescue Service. All information contained in the report will be factual documentation of the events leading up to the incident, the incident operation(s), the fire fighter mayday(s) and incident mitigation to include adequate resources to treat and transport injured personnel. The resulting findings and recommendations will be used as lessons learned for the Montgomery County Fire and Rescue Service, the region, the State, and the National Fire Service.

Personnel from the Montgomery County Fire/Explosive Investigations Office (FEI) and the District of Columbia Fire Department Arson Squad, worked cooperatively to investigate the fire's origin and cause. The cause remains listed as Under Investigation as of March 2009.

METHODOLOGY

The SIIG gathered a wide variety of data and conducted dozens of interviews during the course of the investigation.

Data gathered included:

- Policies
- Procedures
- Manuals
- Pictures
- Videos
- Audio tapes and transcripts (911 calls, radio, interviews)
- Written statements from personnel who responded to the incident
- Gear worn by the injured fire fighter
- Incident reports
- Fire and Explosive Investigation Office origin and cause investigation
- Certifications and Training Standards
- Apparatus and equipment specifications
- Building material information

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Members of the Investigation Group obtained statements from and/or interviewed the majority of personnel who responded on the initial box alarm to Frederick Avenue.

The SIIG worked closely with the Fire Code Enforcement Fire Modeling Team to develop a model of the incident. The results of their analysis were not available as of the printing of this document.

TERMINOLOGY

All of the times used in this document are expressed using the 24-hour clock.

In 2006, Montgomery County Fire and Rescue Service adopted International Phonetic Alphabet, which assigns a word to each letter of the alphabet, as listed below:

A – Alpha	H – Hotel	O – Oscar	V – Victor
B – Bravo	I – India	P – Papa	W – Whiskey
C – Charlie	J – Juliet	Q – Quebec	X – X-ray
D – Delta	K – Kilo	R – Romeo	Y – Yankee
E – Echo	L – Lima	S – Sierra	Z – Zulu
F – Foxtrot	M – Mike	T – Tango	
G – Golf	N – November	U – Uniform	

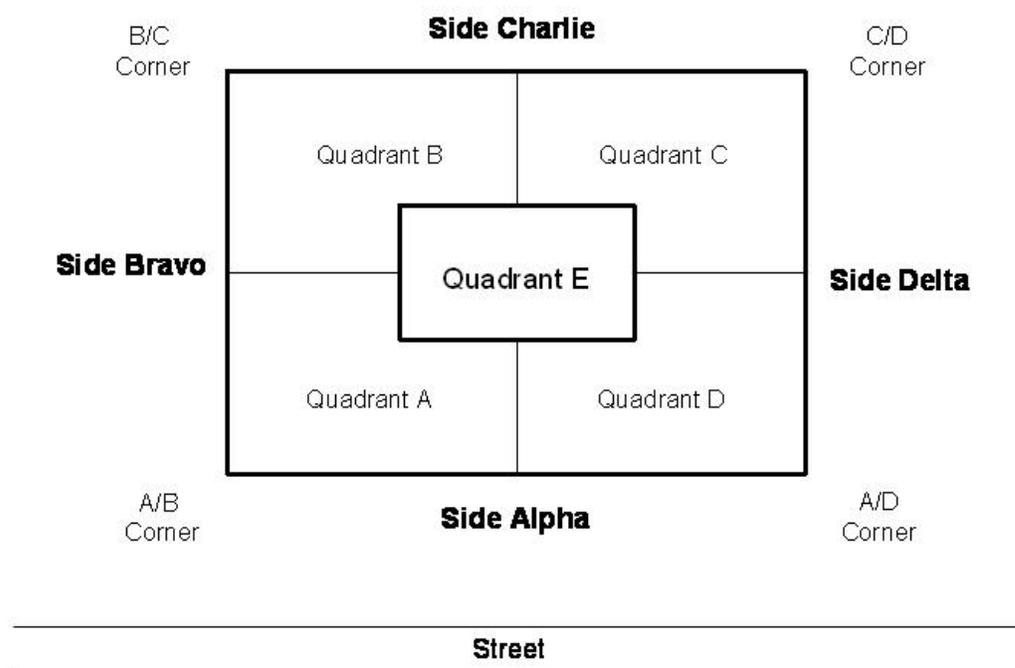
These words are used whenever it is necessary to identify any letter of the alphabet over the 800 MHz radio system or refer to the sides and interior Quadrants of a building. See Figure 1: Terms Used to Describe Building Sides and Interior Quadrants.

Exposures are commonly identified with a letter and a number to describe the location of the structure relative to the fire building. The term “exposure” refers to a structure that is attached or adjacent to the fire building.

Note: All of the quoted text in the document was taken directly from recorded radio transmissions or phone calls. As a result, there are deviations from the phonetic alphabet listed above.

Frederick Avenue - Significant Injury Investigation Report

Figure 1: Terms Used to Describe Building Sides and Interior Quadrants



ORGANIZATION OF THIS REPORT

This *Report* is organized into twelve Chapters and nine Appendices.

- Each Chapter is divided into various sections, which include relevant background information, specific discussion pertaining to the incident on Frederick Avenue, and, where applicable, recommendations for future action.
- The Appendices include a table that summarizes the *Report's* recommendations, transcribed radio traffic, a timeline of critical events, diagrams, and analyses of equipment used by the injured fire fighter.

SCOPE

The SIIG was charged with reviewing this event from the original 911 call through the conclusion of the mayday to include dispatched response plans, the on-scene operations, and the application of relevant policy and procedures.

Background

This Chapter provides an overview of Montgomery County and its use of a combination career and volunteer Fire and Rescue System.

MONTGOMERY COUNTY, MARYLAND

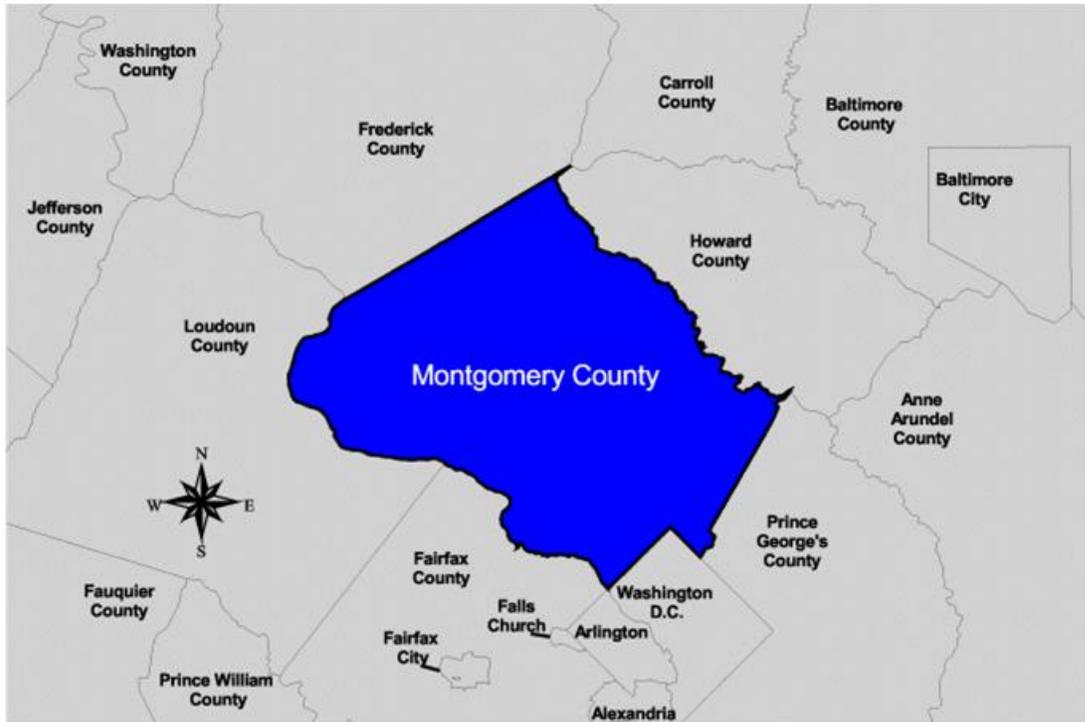
Montgomery County is located in central Maryland, immediately north of Washington, D.C. (See Figure 2: Regional Map.) The County is comprised of 507 square miles encompassing urban, suburban, and rural land uses and densities. 968,000 residents in 2008 and representing a wide diversity of races and ethnicities – resided in Montgomery County in 2008. The Montgomery County Fire and Rescue Service (MCFRS) delivers fire, rescue, and emergency medical services to County residents and businesses. The department responded to 104,837 incidents during 2007.

In 2008, MCFRS had 1,126 career uniformed personnel, approximately 1,500 volunteers, and 113 non-uniformed administrative and support employees. MCFRS has 46 work sites – including 34 fire and rescue stations. The County operates more than 100 frontline primary apparatus, including 32 engines, 24 ambulances, 17 paramedic units, 15 aerial units, 7 heavy rescue squads, and 6 tankers.

Montgomery County contains 19 incorporated Cities/Towns: Rockville, Gaithersburg, Takoma Park, Kensington, Somerset, Garrett Park, Glen Echo, Washington Grove, Poolesville, Laytonsville, Barnesville, Brookeville, Town of Chevy Chase, Village of Chevy Chase, including Section 3 and Section 5, Chevy Chase View, North Chevy Chase, Village of Martin's Additions. Montgomery County is a member of both the Metropolitan Washington Council of Governments (MWCOG) and the National Capital Region (NCR).

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Figure 2: Regional Map

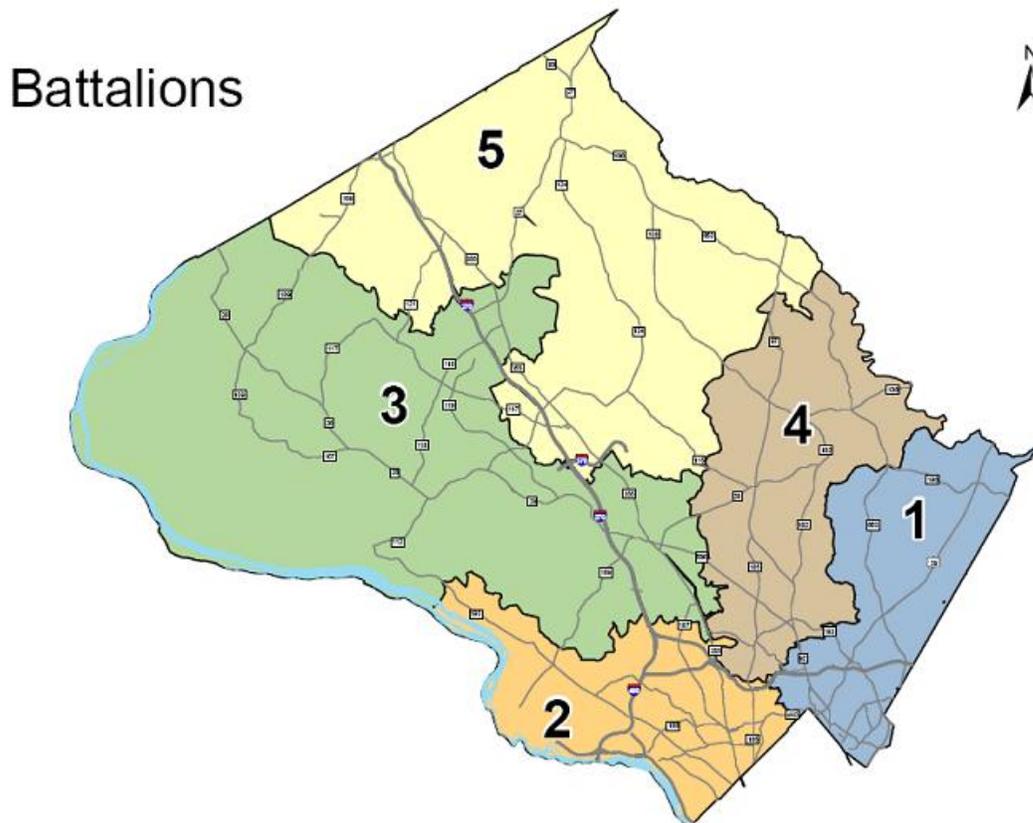


MONTGOMERY COUNTY FIRE AND RESCUE SERVICE

Montgomery County Fire and Rescue Service (MCFRS) is a combination system operating under the direction of the Fire Chief, comprised of career employees and volunteer members, to provide fire, rescue, and emergency medical services (EMS) to its citizens.

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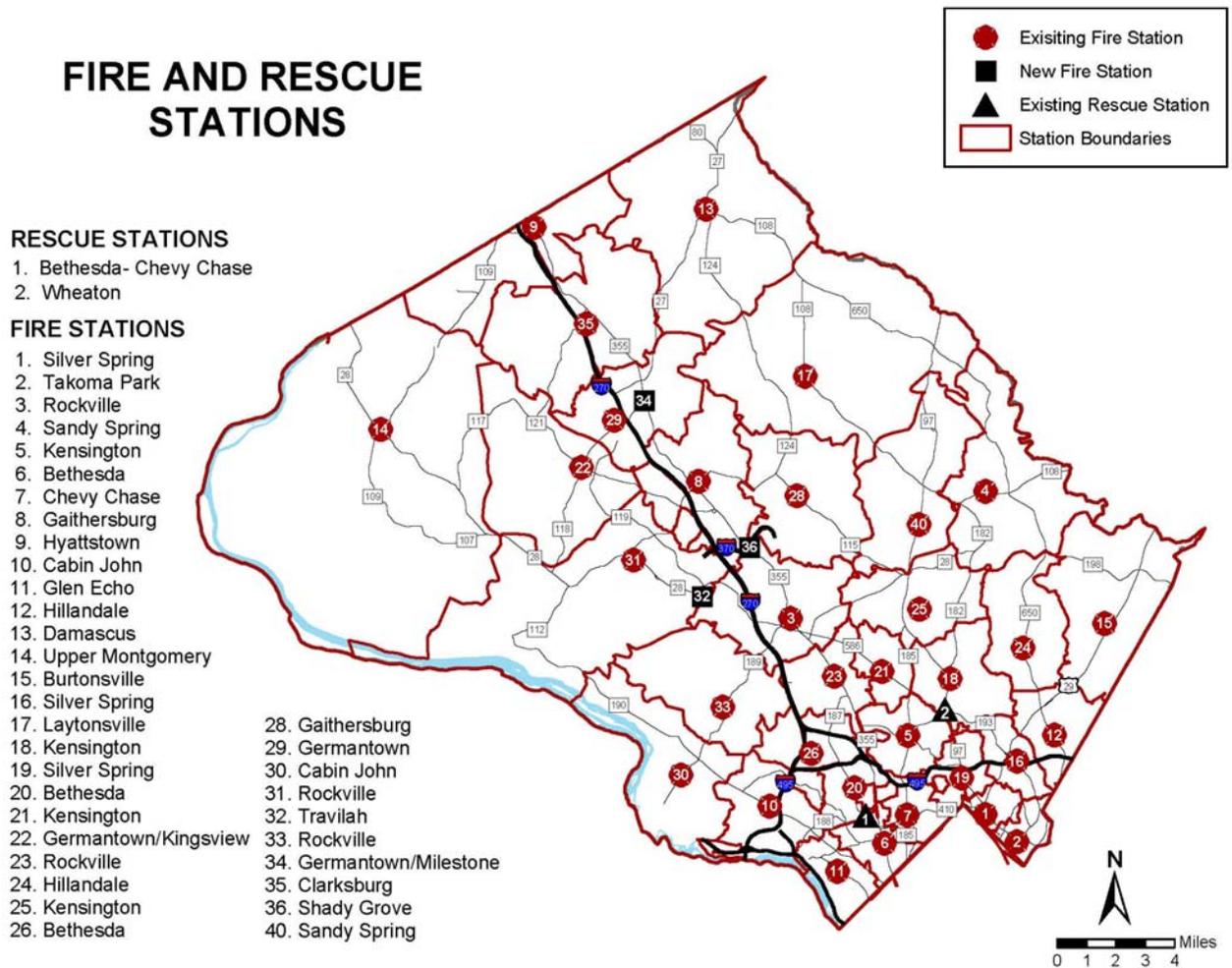
Figure 3: Montgomery County Battalions



As shown in Figure 3: Montgomery County Battalions, the County is broadly divided into five geographical areas, known as battalions.

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Figure 4: Location of the County's 35 Fire and Rescue Stations



LOCAL FIRE RESCUE DEPARTMENTS

There are 19 local fire rescue departments (LFRD) in the County, as listed below. These companies own the majority of the fire/rescue facilities and some fire/rescue apparatus:

- Bethesda Fire Department
- Bethesda Chevy Chase Rescue Squad
- Burtonsville Volunteer Fire Department
- Cabin John Park Volunteer Fire Department
- Chevy Chase Fire Department
- Damascus Volunteer Fire Department

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- Gaithersburg Washington Grove Volunteer Fire Department
- Glen Echo Volunteer Fire Department
- Germantown Volunteer Fire Department
- Hillandale Volunteer Fire Department
- Hyattstown Volunteer Fire Department
- Kensington Volunteer Fire Department
- Laytonsville District Volunteer Fire Department
- Rockville Volunteer Fire Department
- Sandy Spring Volunteer Fire Department
- Silver Spring Volunteer Fire Department
- Upper Montgomery County Volunteer Fire Department
- Takoma Park Volunteer Fire Department
- Wheaton Volunteer Rescue Squad

Each has its own administrative structure with includes bylaws, policies, and procedures. All operational policies and procedures are issued by the County Fire Chief.

VOLUNTEER STAFFING

The Agreement between Montgomery County Volunteer Fire Rescue Association and Montgomery County Government/Montgomery County, Maryland specifies that each LFRD have a Standby Duty Policy that directs the process by which the LFRD uses personnel and resources to reach continuous minimum staffing. These policies are in place to ensure the LFRD schedule volunteer personnel for volunteer staffing periods. As per the agreement, the LFRD Standby Duty Policies were to be submitted by October 31st, 2008.

CAREER STAFFING

Personnel assigned to the Operations Division provide integrated fire and EMS service operating a combination of both ALS and BLS transport units along with paramedic equipped fire apparatus. All operational personnel are cross-trained in fire suppression and EMS, at either the EMT-Basic or EMT-Paramedic level.

Worksites operate with one of four work schedules; depending on the station and the level of operational support requested by the LFRD (see Figure 5: MCFRS Minimum Career Field Staffing).

7/24 – 24 hour shifts followed by 48 hours off (0700-0700), Monday-Sunday

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5/12 – 12 hour shifts (0600-1800), Monday-Friday.

5/10 – 10 hour shifts (0700-1700), Monday-Friday.

7/10 – 10 hour shifts (0700-1700), Sunday – Saturday.

Figure 5: MCFRS Minimum Career Field Staffing

STATION	MINIMUM STAFFING			WORK SCHEDULE
	Officer(s)	Medic(s)	Fire fighter(s)	
Station 1	2	2	7	7/24
Station 2	1		4	7/24
Station 3	1	2	3	7/24
Station 3 (day)	2		5	5/10
Station 4	1	2	2	7/24
Station 5 (day)	1		4	5/12
Station 6	2	1	4	7/24
Station 7	1		3	7/24
Station 8	2	4	6	7/24
Station 9	1		4	7/24
Station 10	2		4	7/24
Station 10 (day)			2	5/10
Station 11	1		4	7/24
Station 12	2	2	7	7/24
Station 13	1	2	2	7/24
Station 14	1	2	3	7/24
Station 15	1	2	2	7/24
Station 15 (day)			1	7/10
Station 16	1		5	7/24
Station 17	1	1	4	7/24
Station 17 (day)	1		2	5/10
Station 18	2	1	4	7/24
Station 19	2	1	4	7/24
Station 20	1		2	7/24
Station 21	1	1	4	7/24
Station 22 ¹	1	1	4	7/24
Station 23	2	2	7	7/24
Station 24	1	1	4	7/24
Station 25	2	2	7	7/24
Station 26	1		2	7/24
Station 28	1	1	4	7/24
Station 29	3	2	9	7/24

¹ FS22 started service on February 1, 2009

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STATION	MINIMUM STAFFING			WORK SCHEDULE
	Officer(s)	Medic(s)	Fire fighter(s)	
Station 30	1	2	2	7/24
Station 31	2	2	5	7/24
Station 33	1		4	7/24
Station 35	2	2	5	7/24
Station 40	1		2	7/24
Station 40 (day)			2	5/10
Rescue 1 (day)	1	1		5/12
Rescue 2 (day)	1	4	4	5/12
Duty Chief 700	Career Assistant Chief			7/24
Battalion Chief 701	Career Battalion Chief			7/24
Battalion Chief 702	Career Battalion Chief			7/24
Battalion Chief 703	Career Battalion Chief			7/24
Battalion Chief 704	Career Battalion Chief			7/24
Battalion Chief 705	Career Battalion Chief			7/24
EMS 701 ²	Career EMS Captain Supervisor			7/24
EMS 702	Career EMS Captain Supervisor			7/24
EMS 703	Career EMS Captain Supervisor			7/24
Safety 700	Career Safety Captain			7/24
Comd Support 700	Career Scheduler			7/24

² EMS701 no longer in service

Incident Overview

WEATHER

At the time of the event the weather history indicates that the temperature was 46.4° Fahrenheit with a dew point of 46.4°, humidity of 100%, and calm winds.

DESCRIPTION OF THE STRUCTURE

This chapter provides a detailed description of 219 Frederick Avenue, including the topography of the lot, floor plans, building construction and features, and how these factors impacted the incident.

From SIDE ALPHA and Charlie, the structure has two stories above grade.

Figure 6: 219 Frederick Ave, SIDE DELTA profile



(dotted line indicates grade)

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In 1949, the Rockville City Department of Permitting Services issued a building permit for a single family dwelling to be located at 219 Frederick Avenue, in the Lincoln Park subdivision. The house consisted of two floors of finished living space totaling 1,044 square feet, first floor approximately 720 square feet and 324 square feet on the second floor, with a 720 square foot basement. The structure also has a 126 square foot attached screen porch on SIDE DELTA.

Figure 7: 219 Frederick Avenue, SIDE ALPHA



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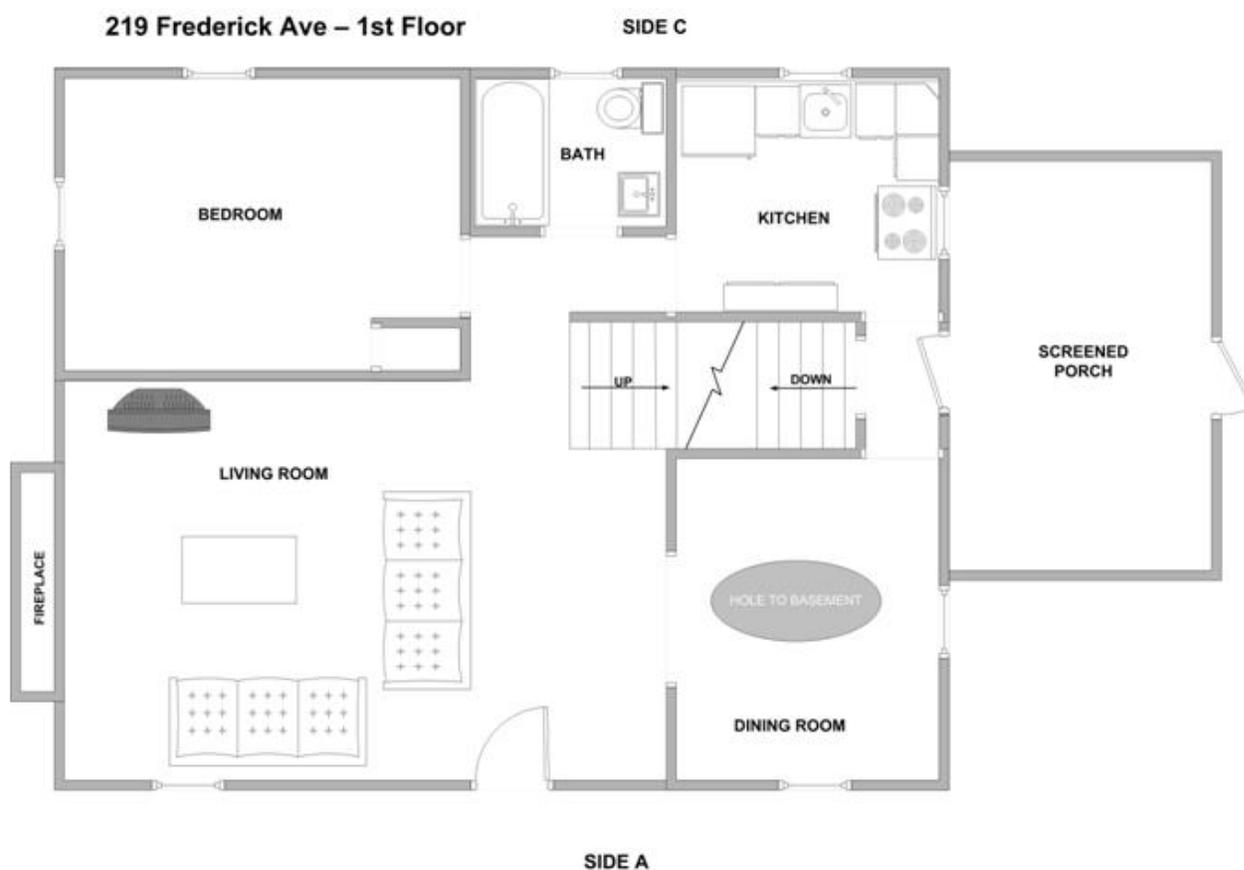
Figure 8: 219 Frederick Avenue, SIDE CHARLIE



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Layouts of the first floor, basement, and second floor are shown in Figure 9: First Floor, Figure 10: Basement and Figure 11: Second Floor . For larger versions of these figures, see Appendix 1 – Floor Plans

Figure 9: First Floor



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Figure 10: Basement



Figure 11: Second Floor



BUILDING CONSTRUCTION AND FEATURES

In the fire service, the term “building construction” refers to the type materials used in the construction of the structure, as well as the combustibility and the fire resistance rating of a building's structural elements. As classified by the 2003 International Building Code (6th printing) the structure at 219 Frederick Avenue is of Type III construction.

602.3 Type III. Type III construction is that type of construction in which the exterior walls are of noncombustible material and the interior building elements are of any material permitted by this code.

The foundations consisted of stacked concrete block and then stick framed exterior walls with stucco finish. The floor joists were 2x8 full dimensional lumber that ran from SIDE ALPHA to CHARLIE. A center steel beam ran from SIDE BRAVO to DELTA. The joist span from front to back was 12'. The joist were sat on the block wall and mortared around on SIDE ALPHA and then sat on top of the center steel beam.

Floor Coverings

The sub floor consisted of 1x6 tongue flooring laid diagonal to the joist. The majority of the flooring material on the first floor was hardwood, with the exception of the kitchen, which had sheet vinyl flooring. The stairs and entire second floor were carpeted.

Figure 12: Floor Coverings



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Ceiling Height

The ceiling height on the first floor was 8 feet. The ceiling height in the basement was 6' 8" with ½" drywall finish.

Side Charlie

As noted earlier, the building lot was predominately flat and there was no elevation difference from SIDE ALPHA to CHARLIE. The exterior entrance to the basement was via a set concrete stairs with a brick/block support wall on SIDE CHARLIE. The stair entrance was level with the ground level and the open was not surrounded by a railing. See Figure 8: 219 Frederick Avenue, SIDE CHARLIE

Exposures

The Bravo Exposure, 43 feet away, was a two story single family dwelling of similar construction. The exposed surfaces of the structure consisted of concrete block on the main house and vinyl siding on the SIDE CHARLIE addition. There was no damage to the Bravo Exposure.

The Delta Exposure, 56 feet away, originally was the same construction before a full second floor addition was added. The exposed surface of the structure consisted of brick on the first floor and stucco on the second floor. There was no damage to the Delta Exposure.

Impact on Incident

The construction features and building materials, in particular the full dimensional floor joists, 1x6 tongue and groove sub floor, and hardwood finished floor contributed to the timing of the dining room floor failure by maintaining floor integrity longer before collapse.

During the investigation, the SIIG discovered an on-line training course offered by Underwriters Laboratory that includes a video of a test burn of a very similar floor and fire composition. The course, Structural Stability of Engineered Lumber in Fire Conditions, summarizes a research study on the hazards posed to fire fighters by the use of lightweight construction and engineered lumber in floor and roof designs

The video, 2x10 Floor Joist Video 2, part of Module 3: Fire Tests is strikingly similar to the events that unfolded on this fire.

Frederick Avenue - Significant Injury Investigation Report

The course is available at no cost on-line at <http://www.uluniversity.us/catalog/display.resource.aspx?resourceid=187716>

ORIGIN AND CAUSE

Personnel from the Montgomery County Division of Community Risk Reduction Services, Office of Fire Marshal, Fire/Explosive Investigations Section worked to investigate the fire's origin and cause.

They were assisted by an accelerant detection canine from the District of Columbia Fire and Emergency Services Department.

The fire remains under investigation however the investigators believe that the fire originated in the basement in the Quadrant Delta bedroom.

Summary of Dispatched Units

911 Call 01:26:26

Transformer 01:27:43

E703

Upgrade to Full Assignment 01:36:14

E723
T703
RS703
A723
BC703

E721
AT723

BC704

E733

E725

C703
DC700

C703B
DC700B

C703C
SA700

C703F
U2

C705D

RID 01:41:13

RS742

AT725

M723

Task Force 01:54:38

E728

E726

AT731

EMS Units 01:56:50

M703

M725

Mayday Task Force 01:59:04

A703

RS741

Summary of Personnel for Critical Units

E703

Position	Rank	MCLOS ³	Reference
Driver	Career FF3	7 years	E703 Driver
Officer	Career MFF	8 years	E703 Officer
Right	LFRD F/R Candidate	4 months	E703 Right
Left	LFRD F/R Candidate	3 months ⁴	E703 Left
5 th	LFRD FF2	4 years	E703 5 th
6 th	LFRD Observer	0 months	E703 6 th

E723

Position	Rank	MCLOS	Reference
Driver	Career MFF	27 years	E723 Driver
Officer	Career Captain	14 years	E723 Officer
Right	Career FF3	4 years	E723 Right
Left	Career FF3	8 years	E723 Left

E721

Position	Rank	MCLOS	Reference
Driver	Career FF3	9 years	E721 Driver
Officer	Career Lieut	25 years	E721 Officer
Right	Career FF2	3 years	E721 Right
Left	Career FF2	2 years	E721 Left

E733

Position	Rank	MCLOS	Reference
Driver	Career MFF	6 years	E733 Driver
Officer	Career Captain	22 years	E733 Officer
Right	Career FF2	3 years	E733 Right
Left	Career FF2	1 year	E733 Left
5 th	Career FF2	7 months	E733 5 th

E725

Position	Rank	MCLOS	Reference
Driver	Career MFF	7 years	E725 Driver
Officer	Career Lieut	11years	E725 Officer
Right	Career FF2	3 years	E725 Right
Left	Career FF2	1 year	E725 Left

³ MCLOS – Montgomery County Length of Service

⁴ Previous Fire Department experience prior to MCFRS

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T703

Position	Rank	MCLOS	Reference
Driver	Career MFF	19 years	T703 Driver
Officer	Career Lieut	23 years	T703 Officer
Right	LFRD FF2	4 years	T703 Right
Left	LFRD FF2	2 years	T703 Left
5 th	LFRD FF2	5 years	T703 5 th
6 th	LFRD FF1	6 years	T703 6 th

AT723

Position	Rank	MCLOS	Reference
Driver	Career MFF	20 years	AT723 Driver
Officer	Career Lieut	9 years	AT723 Officer
Right	Career FF3	21 years	AT723 Right

RS703

Position	Rank	MCLOS	Reference
Driver	LFRD FF3	7 years	RS703 Driver
Officer	LFRD MFF	7 years	RS703 Officer
Right	LFRD FF3	14 years	RS703 Right
Left	LFRD FF1	1 year	RS703 Left
5 th	LFRD F/R Candidate	3 months	RS703 5 th

Command Officers

Position	Rank	MCLOS	Reference
Chief 703	LFRD Chief	34 years	C703
Chief 703 Bravo	LFRD Deputy Chief	17 years	C703B
Chief 703 Charlie	LFRD Deputy Chief	30 years	C703C
Chief 703 Foxtrot	LFRD Deputy Chief	18 years	C703F
Battalion 703	Career Batt Chief	21 years	BC703
Battalion 704	Career Batt Chief	26 years	BC704

Sequence of Operations

At 0126 hours, on October 2, 2008, MCFRS Emergency Communications Center (ECC) received a 9-1-1 telephone call reporting a transformer fire in the area of 222 Frederick Avenue.

Note: During the incident E703 6th used the digital camera from E703 and documented the fire ground. The time/date function on the camera was not accurately set and thus the SIIG utilized these pictures to establish an “approximate” timeline. The picture shown in Figure 31: SIDE ALPHA/DELTA Corner - Approx Time 01:52 showing RS703 Driver on SIDE DELTA with only 2 personnel assisting was synchronized to 01:52.

E703

On the evening of the Frederick Avenue incident, E703 was utilizing the regular E703 configured for six riding positions, with five self contained breathing apparatus (SCBA) and four portable radios.

At 0127 hours ECC alerted Rockville Station 3 for the single engine transformer fire response. E703 responded on talk group 7 Bravo at 0130 with a crew of six personnel, one of whom was an observer. E703 traveled to Frederick Avenue by way of North Stone Street Avenue. As E703 approached the address of dispatch, several members of the crew noticed smoke along the street ahead of them. At 0134 hours, Engine 703 arrived in the area and reported a working structure fire in the basement of 219 Frederick Avenue. The building is a two story single family dwelling with a full basement. E703 Officer requested a house fire assignment and began initial firefighting operations.

At 0136 hours, ECC dispatched E723, E721, E733, T703, AT723, RS703, A723, Battalion Chief 703, Battalion Chief 704 and Rockville and Kensington Duty Officers to assist on the incident. All units were directed to respond/switch to talk group 7 Charlie.

Engine 703 Driver

E703 Driver initially made a left onto Frederick Avenue from North Stone Street Avenue. E703 Driver and Officer realized that they should have made a right on Frederick Ave and E703 Driver turned the vehicle around. E703 Driver observed

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smoke rolling across the street. Upon arrival in the 200 block of Frederick Avenue, the crew of E703 discovers a house on fire and E703 Officer requested the house fire assignment. The crew hand advanced 500 feet of 4 inch supply line to the hydrant at 715 Lenmore Avenue and E703 Driver connected that supply line to the pumper.

The next due engine company, E723, was to connect to E703's hydrant, however they had committed their approach to the scene from Westmore Avenue. E723 positioned "nose to nose" with E703 and was unable to proceed around the on scene emergency apparatus to get to Lenmore Avenue to complete this assignment. E703 Driver and E723 Driver met with each other and verbally agreed to a plan for the next arriving engine company, E725, to stop at the fire hydrant at the intersection of Frederick Avenue and Westmore Avenue and to establish a water supply for E723.

E723's driver pulled a 4 inch supply line from their location to the intersection. E725 acknowledged the assignment, stopped at the intersection and completed the water supply assignment.

E703 Driver then pulled a back up hand line from E703 to the SIDE ALPHA entrance. This line was a 200 foot 1 ¾ inch with a 15/16 inch smooth bore nozzle.

Engine 703 Officer

As E703 arrived on scene, E703 Officer radioed on 7-Bravo that he had fire in the basement of a house.

01:34:00 E703 Officer

Engine 703 on scene 219 Frederick Ave I have a 1 1/2 story single family basement on fire, start the box, I will have command.

Upon arrival on scene E703 Officer exited the apparatus in full personal protective equipment (PPE) and observed that E703 Right had also exited the vehicle and was pulling a hand line. E703 Officer instructed E703 Right to hold off on pulling the line and assist with establishing water supply. E703 Officer then made a radio transmission on 7-Charlie responding to a transmission from E723 requesting water supply instructions.

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01:38:13 E703 Officer

That's correct we just got it, Engine 703 to Montgomery, I got command 1 1/2 story single family - got fire in the basement. Our line is on Lenmore Ave. just off Frederick, have the 2nd engine pick it up. Truck 3, Truck 703 is my 2 out.

01:38:37 E703 Officer

Also be advised I have a report of a vacant house.

E703 Officer then responds to a second radio transmission from E723 Driver requesting water supply instructions.

01:38:50 E703 Officer

Its on Lenmore just off Frederick.

E703 Officer then performed a circle check and did not notice the SIDE CHARLIE exterior basement entrance due to the darkness, lack of a hand railing, and tall grass. Upon returning to SIDE ALPHA E703 Officer meet up with RS703 Officer. E703 Officer instructed the rescue squad crew to ventilate the building. E703 Officer then donned the SCBA face piece and proceeded to enter the structure along with E703 5th.

Figure 13: SIDE ALPHA - Approx Time 01:39 hrs



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E703 Officer and 5th stretched the attack line into the structure with moderate difficulty due to some furniture and other obstructions blocking the advancement of the hose line.

At 0139 Chief 703C arrived on scene and assumed Command from E703 Officer.

01:39:32 Chief 703C

Chief 703C on the scene assuming Command - have fire showing on SIDE DELTA, alpha Quadrant.

Then Command called E703 to determine if there was a rear entrance.

01:41:34 Command

Command to Engine 703 do you have a rear entrance?

Figure 14: SIDE DELTA Basement Window - Approx Time 01:41



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There is no response and Command then calls E703 again.

01:43:33 Command

Command to Engine 703 do you have a rear entrance?

01:43:37 E703 Officer

Go ahead.

01:43:40 Command

Do you have a rear entrance to this house?

01:44:06 Command

Command to Engine 703.

01:44:11 E703 Officer

Go ahead.

01:44:13 Command

You will be Basement Division; You will have Engine 703, Engine 723, and Truck 703 in your Division.

E703 Officer then met up with RS703 Officer who advise the location of the interior basements stairs. E703 Officer and 5th then position at the top of the basement stairs. E703 Officer then responds to a radio transmission from Command asking if they are holding the top of the stairs.

01:44:28 RS703 Officer

Rescue Squad 703 to command - We have located basement steps - the engine is preparing to make entry down the basement.

01:44:40 Command

Command's direct.

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Chief 703 then makes the following transmission:

01:44:44 Chief 703

Chief 703 to command - you have a rear entrance to the basement.

Command then advises E703 Officer that there is a change in their assignment:

01:44:50 Command

Command to Engine 703 there is a rear entrance to the basement - go ahead and hold up and I will have Engine 723 pull a line in to protect the steps.

01:45:12 E703 Officer

Engine 703 to command - we are at the top of the steps holding it in check right now with a hand line.

Figure 15: SIDE DELTA Basement Window - Approx Time 01:45



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01:45:45 Command

Engine 703 you will be Division 1 - you copy Division 1.

01:46:46 Command

Command to Engine 703.

01:46:55 E703 Officer

Go ahead for Engine 703.

01:46:59 Command

Just confirming that you are holding the fire at the top of the steps correct?

01:47:04 E703 Officer

That's correct - I have myself and Rescue Squad 3 with me.

01:47:09 Command

Ok I am going to have Engine 703, Truck 3, be Division 1 at the top of the steps - Chief 703F will coming with you to assume that Division in just a few moments.

01:47:27 E703 Officer

I did not copy that last transmission - who else do I have?

Command responds:

01:47:33 Command

That's Engine 703, Truck 703 will be Division 1 at the top of the steps you will have Chief 703F will be joining you in just a moment.

Chief 703F assumes Division 1 and radios:

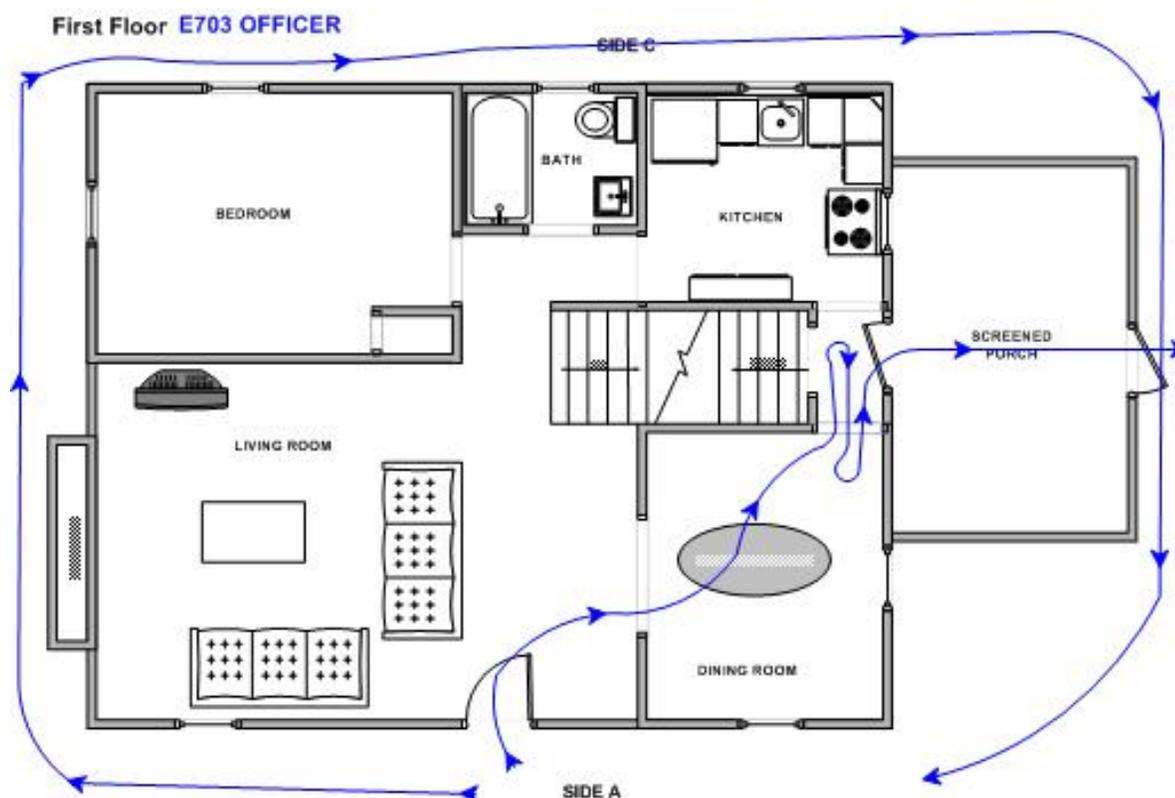
01:50:49 Division 1

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Division 1 command, they're in, they're ready for the basement attack, have them go ahead.

At that point, E703 Officer meets up with T703 Officer who is now in Quadrant Delta, close to the basement stairs. T703 Officer and E703 Officer confer and agree that the floor is getting spongy and that they should exit the structure. E703 Officer advises E703 Left and RS703 Driver that the floor is spongy and they must exit the structure.

Figure 16: E703 Officer's Path



As they were preparing to exit, T703 Officer transmits the first muffled mayday at 01:52:41 due to the floor collapse and unknown missing fire fighters. E703 Officer is pulled back by E703 Left, who believed that the Officer was falling into the hole. At that point both E703 Officer and E703 Left exit the structure via what they believe to be a window immediately behind them, at the top of the basement stairs between Quadrants Charlie and Delta.

Upon exiting the structure, E703 Officer reunites with the remainder of E703's crew.

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Engine 703 Right

Upon arrival on scene E703 Right exited the apparatus in full PPE including a portable radio, observed smoke and fire coming from a basement window on SIDE DELTA, and proceeded to pull a 1 ¾" hose line to the front door. About half way through pulling the hose line, E703 Officer advised E703 Right to hold off on pulling a hand line and to assist with locating a water supply.

E703 6th advised E703 Right that they have located a hydrant on Lenmore Avenue. E703 Right retrieved the Humat valve, folds a length of supply line over a shoulder and proceeds down Frederick Avenue towards the hydrant on Lenmore Avenue.

On the corner of Lenmore Avenue and Frederick Avenue E703 Right met up with E703 5th. E703 Right advised E703 5th to stand on the corner and feed supply line. E703 Right then connected the Humat valve to the hydrant at 715 Lenmore Avenue and made an attempt to transmit on the radio that the Humat has been connected, but E703 Right is unable to make a transmission due to heavy radio traffic. Upon hearing a radio transmission to charge the hydrant, E703 Right completes the assignment.

01:39:09 E703 Driver

Squad make sure the hydrant's charged.

At this time, E703 Right returned to the structure and observed that the remaining crew of E703 has already entered the structure and that there are already two lines going into the structure. E703 Right observed that T703 Officer is feeding hose into the structure and E703 Right assumed this role. E703 Right proceeded to enter the structure to reunite with E703, but believed there are at least two personnel on each line and a number of others so E703 Right exited the structure to retrieve a tool and then reentered the structure.

E703 Right observed two fire fighters believed to be RS703 Left and RS703 5th with a hose line at the stairs leading to the second floor.

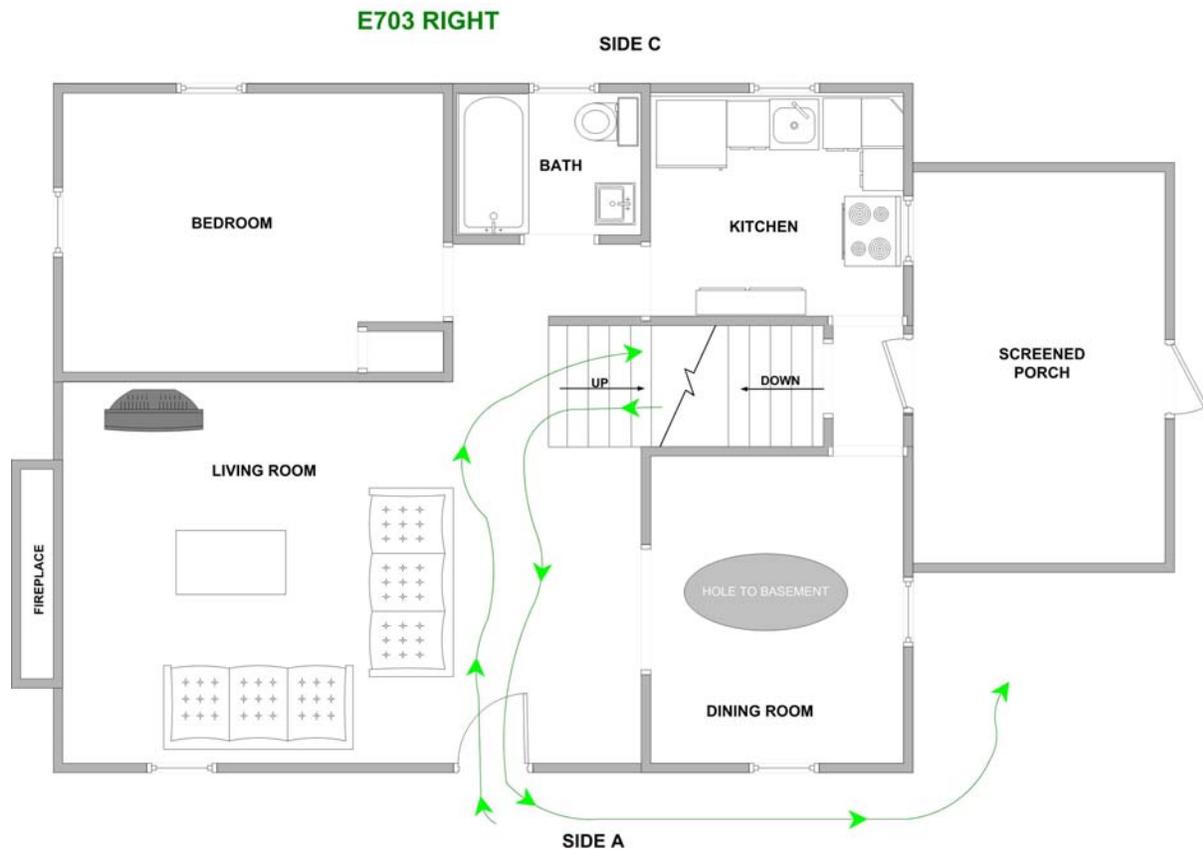
At that point, E703 Right meets up with T703 Left and observes that T703 Left does not have a radio. They confer and agree to proceed to the second floor together to conduct a secondary search. They proceed up the stairs and started searching the first room on the second floor.

E703 Right hears a mayday over the radio and calls out to T703 Left, "they just declared a mayday, they're pulling everyone out." E703 Right sounds, with the hand

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tool, a couple of stairs and then the two proceed down the stairs. At the bottom of the stairs E703 Right observes a number of fire fighters on the first floor, not being sure if they have a radio, E703 Right calls out to them advising “they’re backing everyone out.”

Figure 17: E703 Right's Path



As E703 Right exits the front door, E703 Right observes everyone looking toward SIDE DELTA of the structure. E703 Right observes RS703 Driver being dragged from the structure. E703 Right assists with removing RS703 Driver's gear. While assisting with removal of the PPE, E703 Officer locates E703 Right and E703 Right reunites with the rest of the E703 Crew.

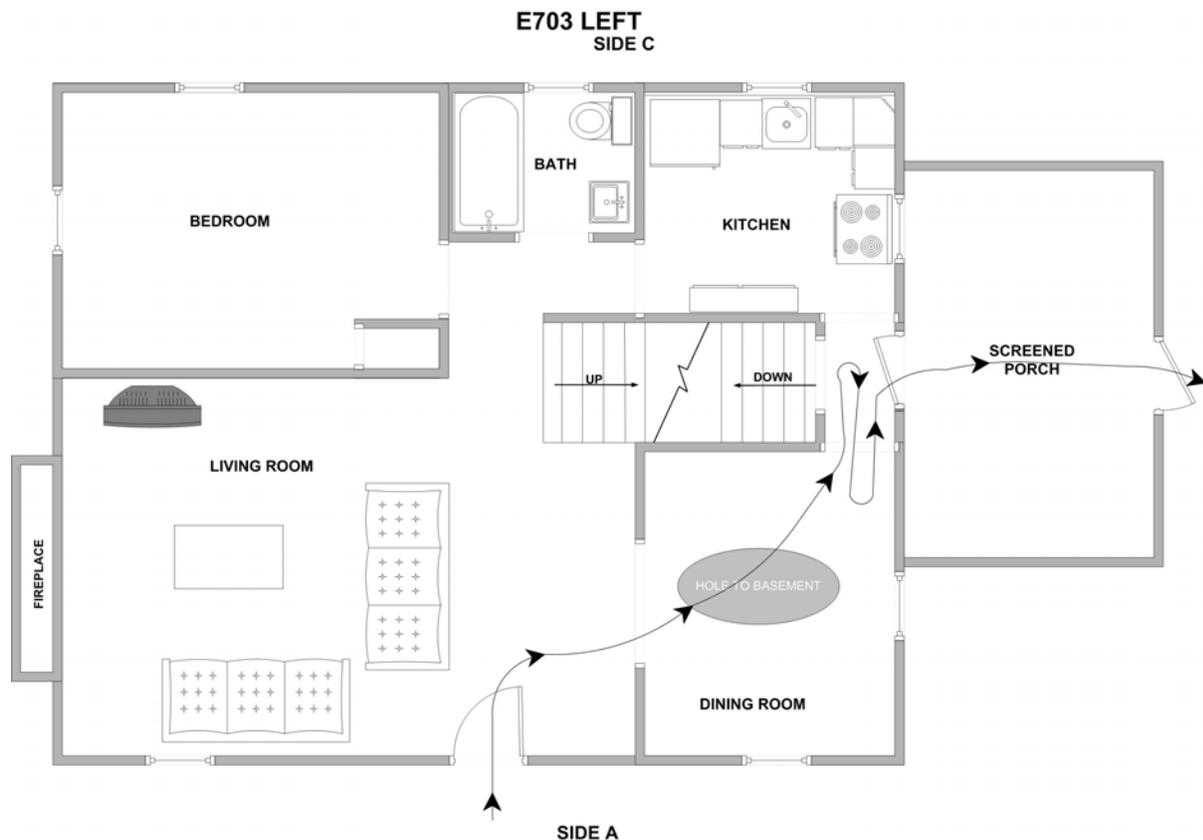
Engine 703 Left

Upon arrival, E703 Left exited the apparatus in full PPE without a portable radio. E703 Left observed that E703 Right has started to pull a hose line. E703 Left was

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then ordered by E703 Officer to assist with obtaining a water supply. E703 Left helps hand advance 500 feet of 4 inch supply line to the corner of Frederick Avenue and Lenmore Avenue. E703 Left stands-by on the corner to assist with pulling enough line to reach the hydrant. Upon observing that enough hose had been pulled E703 Left returned back to E703.

Figure 18: E703 Left's Path



E703 Left continued to deploy the hose line first pulled by E703 Right. E703 Left was assisted by the crew of RS703 in deploying that line. Upon reaching the door, E703 Left met up with E703 Officer. The front door is closed and secure, so E703 Left returned to E703 to get forcible entry tools. Upon returning to the front door, the door was open. E703 Left entered along with E703 Officer into the structure. At that point other fire fighters are advancing a second hose line that had been pulled to the front door. E703 Left described that the house seemed cluttered with furniture.

E703 Left and E703 Officer are led to the top of the basement stairs by RS703 Officer. E703 Left and Officer advance the hand line across Quadrant Delta to reach

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the basement stairs. Upon arriving at the basement stairs E703 Left and Officer are joined by RS703 Driver. E703 Left positions at the top of the stairs with E703 Officer and RS703 Driver standing behind. E703 Left began hydraulic ventilation through what was thought was a window located behind them. E703 Left also describes that there was heat and fire coming up the stairs. E703 Left opened the nozzle and sprayed down the stairs several times.

E703 Left was advised by E703 Officer the floor was getting spongy and it was time to go. As they were getting ready to back out E703 Left “felt the floor give.” E703 Left heard screaming from another fire fighter but was unsure who it was. E703 Left thought E703 Officer was falling through the hole and E703 Left reached and grabbed E703 Officer. Both E703 Left and Officer exited through what they thought was the window located behind them at the top of the stairs. E703 Left and Officer exited the structure and re-united with the remaining members from E703. Immediately upon exiting, E703 Left observed RS703 Driver being attended to by E703 Right and T703 6th.

Engine 703 5th

Upon arrival, E703 5th exited the apparatus in full PPE without a portable radio. E703 5th observed that E703 Right had started to pull a hose line. E703 5th was then ordered by E703 Officer to assist with establishing a water supply. E703 5th then assists with the supply line deployment. E703 5th then returns to the front of the house and observes that an attack line was already there.

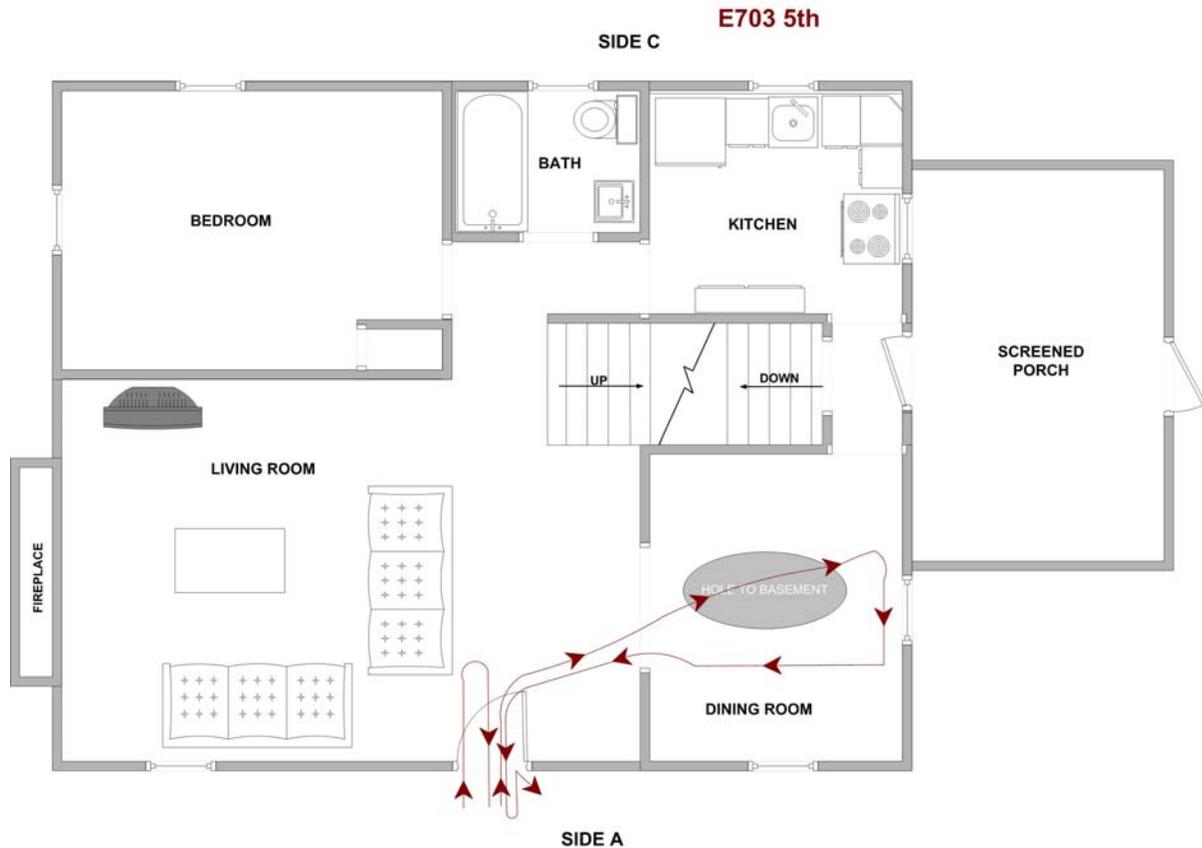
E703 5th arrives at the front door and is handed a 2” hose line, the second hose line off E703. E703 5th pulls the second line into the door, gets part of the way in and is unable to pull the line any further due to unknown obstructions. E703 5th then hands the hose line to another fire fighter and indicates additional hose needs to be advanced in the structure. E703 5th moved to the front door to advance more hose line. After E703 5th feels that enough hose line had been pushed through the door for the second line, E703 5th re-entered the structure and followed the first line looking for E703 Officer.

In the dining room, E703 5th takes a position directly behind E703 Officer and next to T703 Officer. E703 5th described later that there was heavy smoke conditions and smoke was coming up through the floor. E703 5th was against the wall holding the hose line. E703 5th feels the floor start to get warm. E703 5th then starts to sound the floor. E703 5th backs up toward the door. E703 5th hears a “snap and a crackle.” E703 5th yells the floor was going. Shortly after, E703 5th hears a fire fighter screaming for help. E703 5th exits the structure and advises the Division 1

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supervisor what has happened. Division 1 orders E703 5th to assist with the search for the missing fire fighter(s). E703 5th goes back into the structure but is “thrown” back out by another fire fighter.

Figure 19: E703 5th's Path



Upon exiting the structure, E703 5th reunites with E703's crew.

Engine 703 6th

E703 6th was an observer only with no fire fighter training or certification. Upon arrival, E703 6th assisted with locating the hydrant on Lenmore Avenue, obtained a digital camera from E703, and took pictures throughout the incident.

T703

On the evening of the Frederick Avenue incident, T703 was utilizing a reserve truck as the assigned aerial tower was out of service. The reserve truck was equipped with four SCBA as compared to the regularly assigned aerial tower, which is equipped with five SCBA. That evening T703 was staffed with six personnel, meaning that two riding positions would be required to obtain SCBA from another unit if needed. There were three portable radios assigned to T703.

Note: During the interviews personnel from T703 identified themselves as riding certain positions however according to Firehouse Incident Reporting; the personnel are rostered in other positions. For the purpose of this report, the members positions are based upon Firehouse Incident Reporting locations.

Truck 703 Driver

T703 arrived as the third unit from Station 3 and parked behind E703 near the intersection of Frederick Avenue and Lenmore Avenue. T703's position was due to E703 positioning in front of 217 Frederick Avenue. As such, T703 was located too far from the building to effectively utilize the aerial ladder.

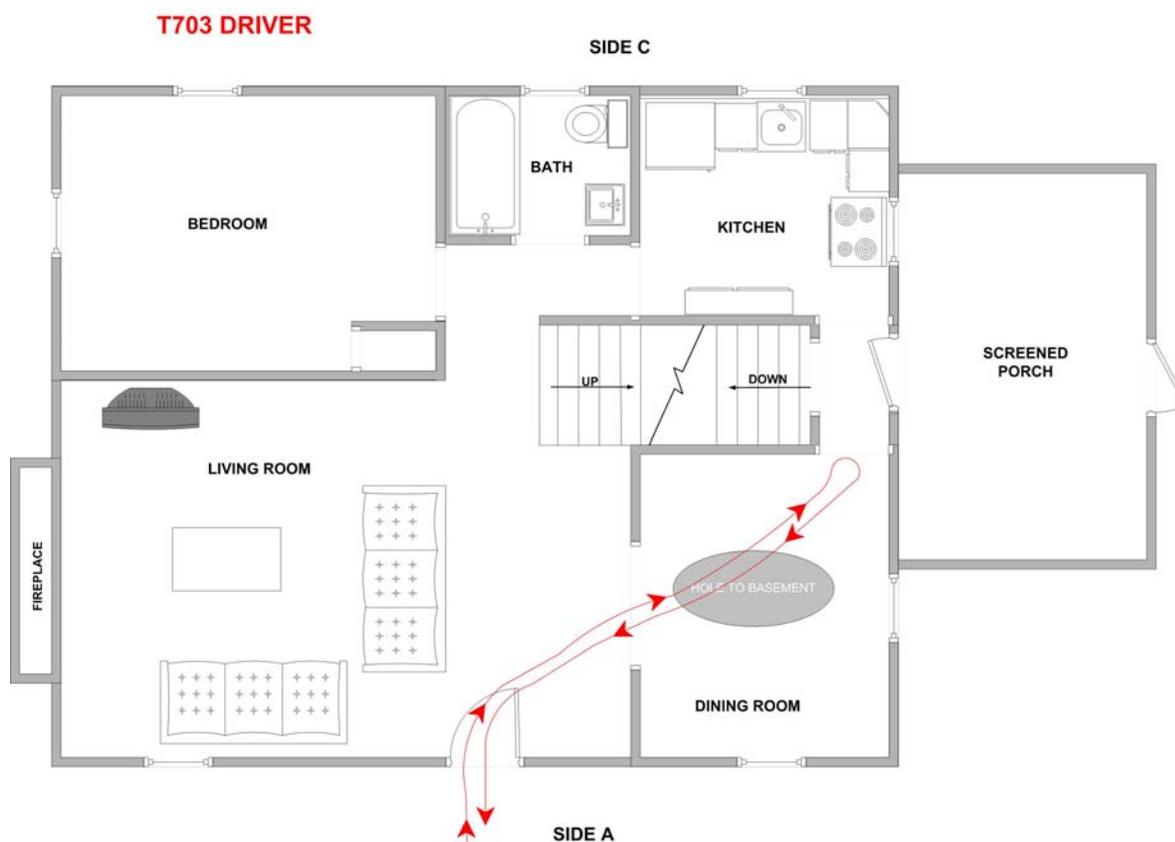
In the absence of a specific assignment from the T703 Officer, T703 Driver moved to the rear of T703 to remove and position ladders to the building. T703 Driver also positioned a ventilation fan on SIDE ALPHA, but did not start the unit. Concurrently windows were being removed by other personnel to ventilate the building.

T703 Driver returned to E723 to don a SCBA and obtain a forcible entry tool. T703 Driver entered the building, alone in full PPE and with a portable radio, via the SIDE ALPHA entrance in an attempt to meet up with the T703 Officer. T703 Driver entered the dining room area and moved across the floor to the interior basement stairs entrance where E703's crew was positioned. T703 Driver recalled several personnel in the area, but did not specifically identify anyone. Within a very short amount of time, T703 Driver was called on the radio and requested to place scene lighting on SIDE CHARLIE of the building. T703 Driver exited the building alone via the SIDE ALPHA entrance and returned to T703 to complete the assignment. A Rockville City police officer, who is also a Rockville VFD member, assisted T703 Driver in deploying scene lighting.

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At this point, T703 Driver heard the Mayday transmission on 7-Charlie. Prior to being instructed to by Command, T703 Driver switched the portable radio to 7-Delta. T703 Driver observed a member being removed from the basement window on SIDE DELTA, and moved there to assist. By this time, T703 Officer had exited the building and was conducting a PAR of the T703 crew. T703 Driver met the T703 Officer where a face to face PAR occurred.

Figure 20: T703 Driver's Path



Truck 703 Officer

Upon arrival, T703 Officer dismounted the apparatus and donned the assigned SCBA. Due to the cab/seat configuration, the officer SCBA is located next to the officer seat in a separate bracket. While T703 Officer donned full PPE, T703 Right, T703 Left and T703 5th went ahead of T703 Officer toward the SIDE ALPHA entrance. T703 Officer knew T703 6th did not have SCBA and would be remaining outside of the building to assist T703 Driver.

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T703 Officer removed an axe from T703 and approached SIDE ALPHA of the building and noticed heavy fire coming from the basement window on SIDE DELTA. T703 Officer ordered T703 Right and T703 Left to enter the building. T703 Officer observed the T703 5th at the SIDE ALPHA entrance assisting in the advancement of a hose line. T703 Officer assisted here briefly until a verbal command to stop the advancement was heard. T703 Officer entered the building and followed the hose line across the dining room floor, that was advanced by E703.

While crawling toward the dining room, T703 Officer reported several personnel in the first floor hallway area near the entrance to the room. Continuing on, T703 Officer maintained close contact with a partition wall adjacent to the interior stairs and finally reached the location of E703's crew near the entrance to the interior basement stairs. T703 Officer noticed that the windows on SIDE ALPHA had been removed and noted heavy smoke conditions in the room without significant heat present.

T703 Officer was able to identify E703 Officer who advised the E703 crew was protecting the interior basement stairs from that location. During this time, T703 Officer did not know the location of T703 Right, T703 Left and T703 5th.

At approximately 01:50, T703 Officer noticed that the dining room floor was beginning to sag and communicated this to E703 Officer. Both concurred on the need for the crew to quickly exit the area. T703 Officer backed up toward the SIDE ALPHA entrance, again following the attack hose line and maintaining close contact with the partition wall adjacent to the interior stairs. T703 Officer reported hearing a "crunching" sound toward the center of the dining room area and a voice indicating someone was "burning up." Heat conditions in the room also intensified rapidly. T703 Officer, believing a member had fallen through the floor, reached out and searched quickly in the direction of the voice, but found no one. T703 Officer then communicated a Mayday situation

1:52:41 T703 Officer

Mayday, Mayday, Mayday.

Command acknowledged this transmission but was not aware of the context

1:52:47 Command

Command to the last (unknown) message, repeat?

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T703 Officer did not activate the radio's emergency button (EB) and did not copy any acknowledgement of the Mayday from Command. T703 Officer retreated to the entrance of the dining room, activated the EB and re-announced the Mayday on talk group 7-Charlie.

1:53:22 T703 Officer

Mayday, Mayday, Mayday, this is Truck Company 703.

Command acknowledged the transmission.

1:53:32 Command

Command to Truck 703 go ahead with your Mayday.

T703 Officer provided a brief situation, however could not identify the unit or which personnel had fallen through the floor.

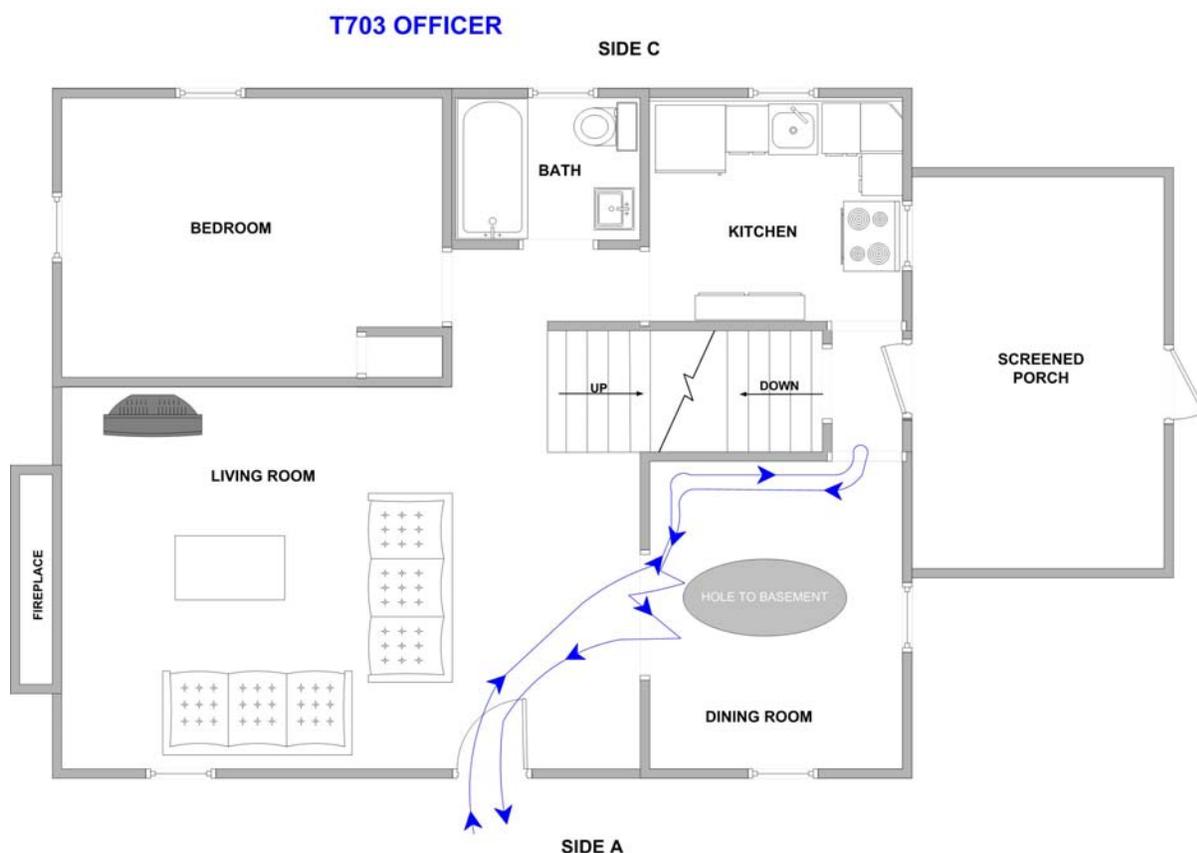
1:53:37 T703 Officer

Through the floor, at this time, I don't have a lot tell you, we have several unaccounted for.

T703 Officer then reached out and searched the area a second time but could not locate any one. After assessing that no members were remaining in the room, T703 Officer exited the building via the SIDE ALPHA entrance.

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Figure 21: T703 Officer's Path



Once outside, T703 Officer noticed a member being removed from the basement SIDE DELTA, Quadrant Delta window. T703 Officer was able to locate and account for the crew of T703.

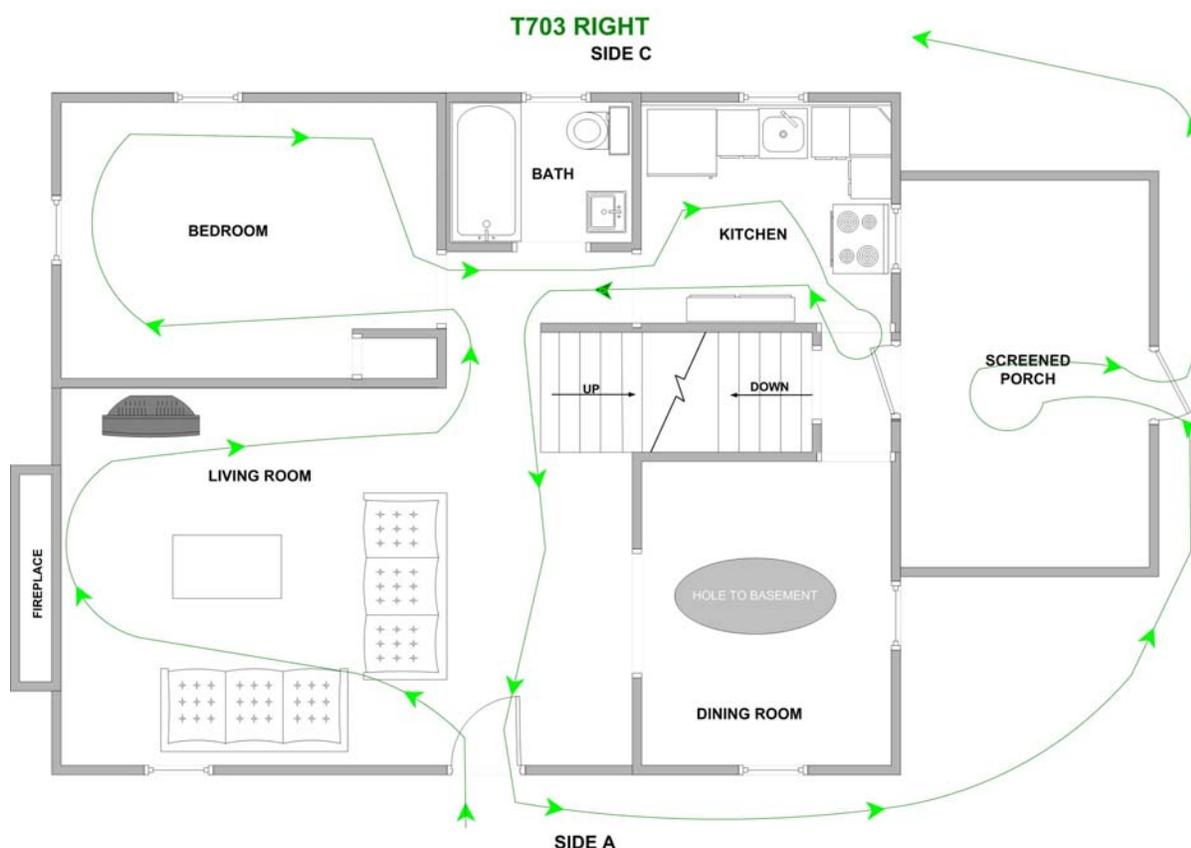
Truck 703 Right

Upon arrival, T703 Right exited the apparatus and met up with the T703 Officer. T703 Right observed the T703 Driver and another person moving to the rear of the apparatus to remove ground ladders. T703 Right indicated an intent to perform a quick primary search which was acknowledged by T703 Officer. T703 Right moved to the SIDE ALPHA entrance and observed a hose line that had been advanced into the building and another hose line that had been advanced to the entrance door. T703 Right also observed light gray smoke pushing out of the entrance doorway.

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T703 Right entered the building in full PPE and a portable radio, followed by the T703 Officer. T703 Right initiated a left hand search pattern of the living room, Quadrant Alpha. T703 Right observed T703 Officer enter the building and move to the right to assist in finding the basement stairs.

Figure 22: T703 Right's First Floor Path



T703 Right continued the primary search alone, moving to the master bedroom, Quadrant Bravo, past the first floor bathroom (which was not searched) and into the kitchen, Quadrant Charlie, ending at the general area of the basement stairs. At that location, T703 Right located and identified the crew of E703. T703 Right performed ventilation of the screen door located opposite the basement stairs, then retreated through the kitchen and into the first floor foyer.

T703 Right heard radio traffic that sent E723 to the SIDE CHARLIE exterior basement entrance. Unsure if the second aerial truck (AT723) had arrived on scene to assist E723, T703 Right exited via the SIDE ALPHA entrance and moved toward SIDE CHARLIE of the building via SIDE DELTA. While en route, T703 Right met C703, who requested T703 to double check with E703's crew as to the stability of

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T703 Right, RS703 Officer and RS703 Right were positioning to search the general area where the fire had been extinguished when T703 Right heard a Mayday transmission on the portable radio. T703 Right could not identify the Mayday unit due to radio traffic. T703 Right relayed the Mayday to the RS703 Officer. Shortly after this, T703 Right heard another Mayday transmission and was able to discern that it was issued by the T703 Officer. Realizing that accountability had not been maintained with the T703 Officer, T703 Right advised the RS703 Officer of the need to exit for the Truck 703 PAR. T703 Right exited the building via the SIDE CHARLIE basement entrance and proceeded to SIDE ALPHA via SIDE DELTA.

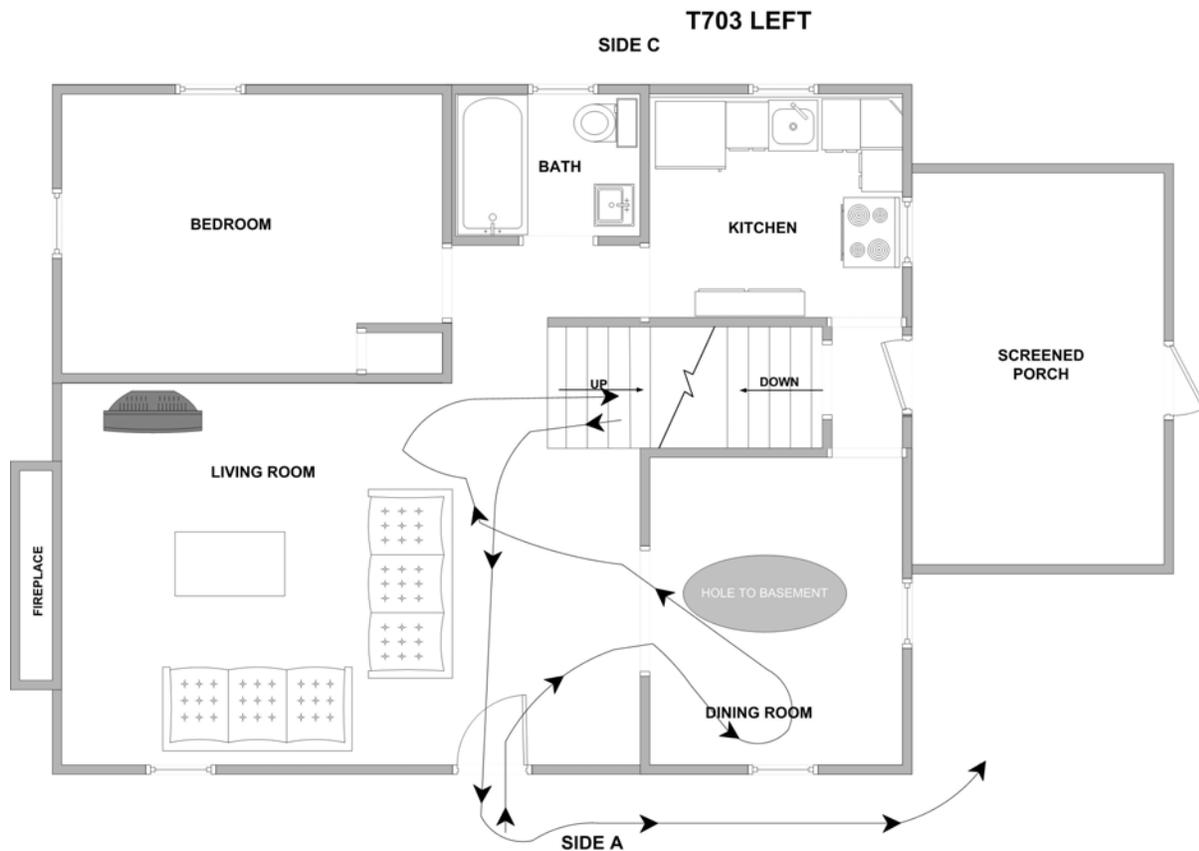
While en-route, T703 Right encountered the removal of the RS703 Driver from the SIDE DELTA basement window. T703 Right moved to assist with the rescue and medical care of the RS703 Driver and observed the T703 Officer, who acknowledged T703 Right for accountability purposes.

Truck 703 Left

Upon arrival, T703 Left exited the apparatus in full PPE but without a portable radio. T703 Left observed fire showing from the basement window on the A/D corner of the building as well smoke showing principally from the first floor windows. T703 Left removed a hook and halligan bar from T703 and observed the T703 Officer donning PPE in preparation to enter the building. T703 Left moved to the SIDE ALPHA entrance, followed by the T703 Officer, and took a position on the stairs leading to the SIDE ALPHA entrance. Smoke and fire conditions had not changed and T703 Left was instructed to enter by the T703 Officer. T703 Left was positioned behind T703 Right. T703 Left received no specific orders from the T703 Officer.

T703 Left entered the building and observed a hose line inside the SIDE ALPHA entrance, and moved into the dining room, Quadrant Delta. T703 Left met the RS703 Officer in this room, and the RS703 Officer instructed T703 Left to perform a secondary search of the second floor. T703 Left exited this room, spoke briefly to T703 Right about the assignment and moved to locate the second floor stairway. While en route, T703 Left conducted a brief search of the living room, Quadrant Alpha. T703 Left found the second floor stairway and was met there by E703 Right, who had a portable radio. The pair advanced as a team to the second floor and prepared to conduct independent searches of the rooms on that level. During these actions, the two remained in visual and voice contact with each other.

Figure 24: T703 Left's Path



Before the secondary search of the second floor could be completed, E703 Right heard a Mayday announcement on the portable radio, with information about the “floor going down.” E703 Right yelled to T703 Left that it was time to leave the building and the two proceeded down the second floor stairs, sounding the stairs as they went. The two exited via the SIDE ALPHA entrance and moved to the yard on the A/D side of the building. There they observed the RS 703 Driver being pulled from the basement window in Quadrant Delta of the building. The T703 Officer, who was also outside and in this area, acknowledged the presence of T703 Left for accountability purposes. T703 Left then assisted in the medical treatment of the RS 703 Driver.

Truck 703 5th

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Upon arrival, T703 5th exited the apparatus in full PPE but without a portable radio. T703 5th does not specifically recall the actions undertaken by the other members from T703 and did not receive any orders from the T703 Officer.

T703 5th observed grayish-black smoke issuing from windows on SIDE ALPHA of the building and recognized that Truck 703 was located too far from the building to effectively utilize the aerial ladder. T703 5th grabbed a 16 foot ground ladder from Truck 703 and deployed it at a window location to the second floor Quadrant Alpha. T703 5th did not perform any ventilation of the building.

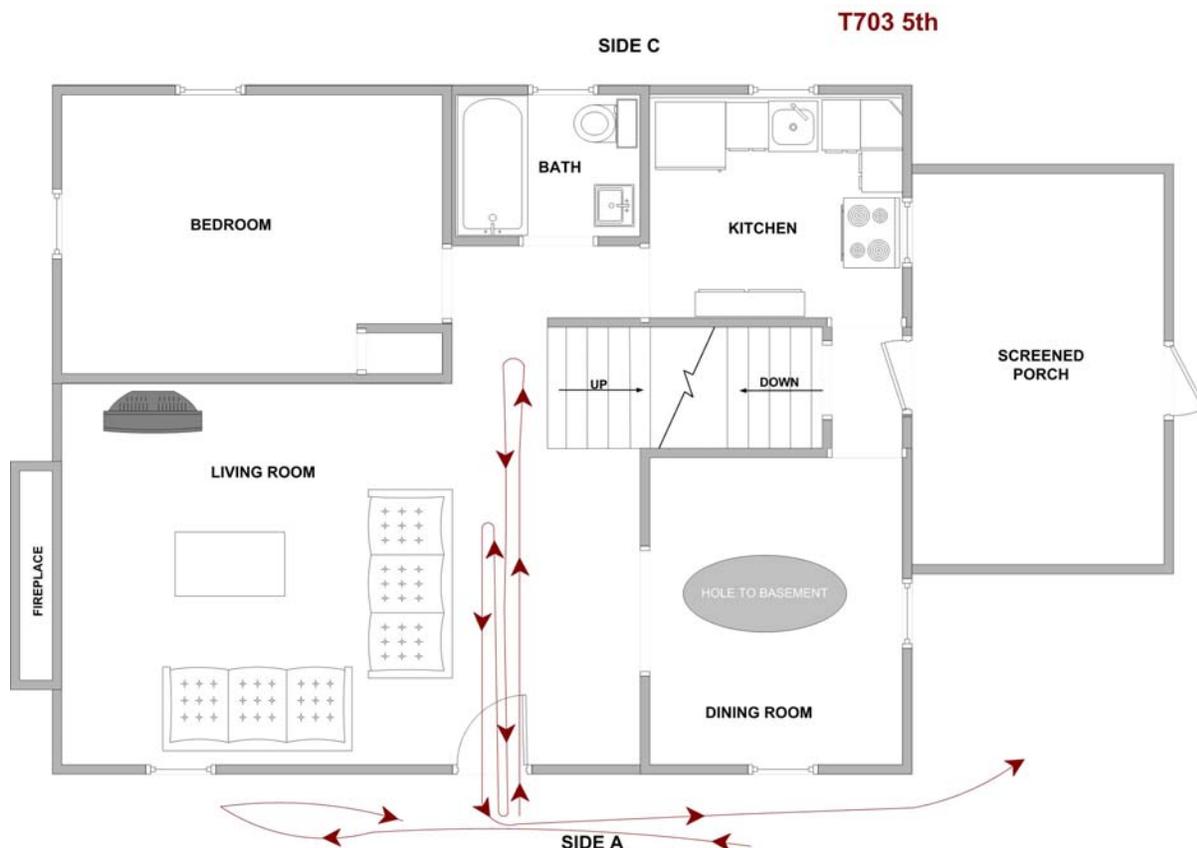
T703 5th then returned to Truck 703 to obtain a hook-style tool to take into the building. T703 5th entered the building alone and without a portable radio or an assignment in an attempt to locate the remainder of Truck 703's crew and to assist in operations.

T703 5th noted a hose line at the SIDE ALPHA entrance and followed this into the first floor hallway area of the building. T703 5th did not advance to the nozzle, however remained in the hallway, noting that visibility was less than one foot. T703 5th recalled seeing fire fighters in the hallway near the bathroom, but could not identify them. T703 5th experienced an air leak around the SCBA mask, left the building via the SIDE ALPHA entrance, adjusted the mask to control the leak and re-entered the building at the SIDE ALPHA entrance.

Upon re-entry, T703 5th noticed a table, approximately 6 feet in diameter, on the left hand side of the hallway and attempted to move it out of the way so as to prevent any blocking of personnel egress from the SIDE ALPHA entrance. T703 5th noted that smoke was beginning to bank down to the floor level and that the ambient heat level was rising. T703 5th heard personnel yelling and recalls Division 1 telling everyone to exit the building. T703 5th does not recall hearing any Mayday or other distress communications.

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Figure 25: T703 5th's Path



T703 5th exited the building via the SIDE ALPHA entrance. T703 5th noted personnel outside in the area on SIDE DELTA and a second hose line at the front door. T703 5th believes the E703 Driver told him to position on this hose line and “get ready for the Mayday.” However, another crew arrived at the SIDE ALPHA entrance and took over this hose line. T703 5th exited the building and moved to the SIDE DELTA area and located members of Truck 703. Here, the T703 Officer performed a personnel accountability check.

Truck 703 6th

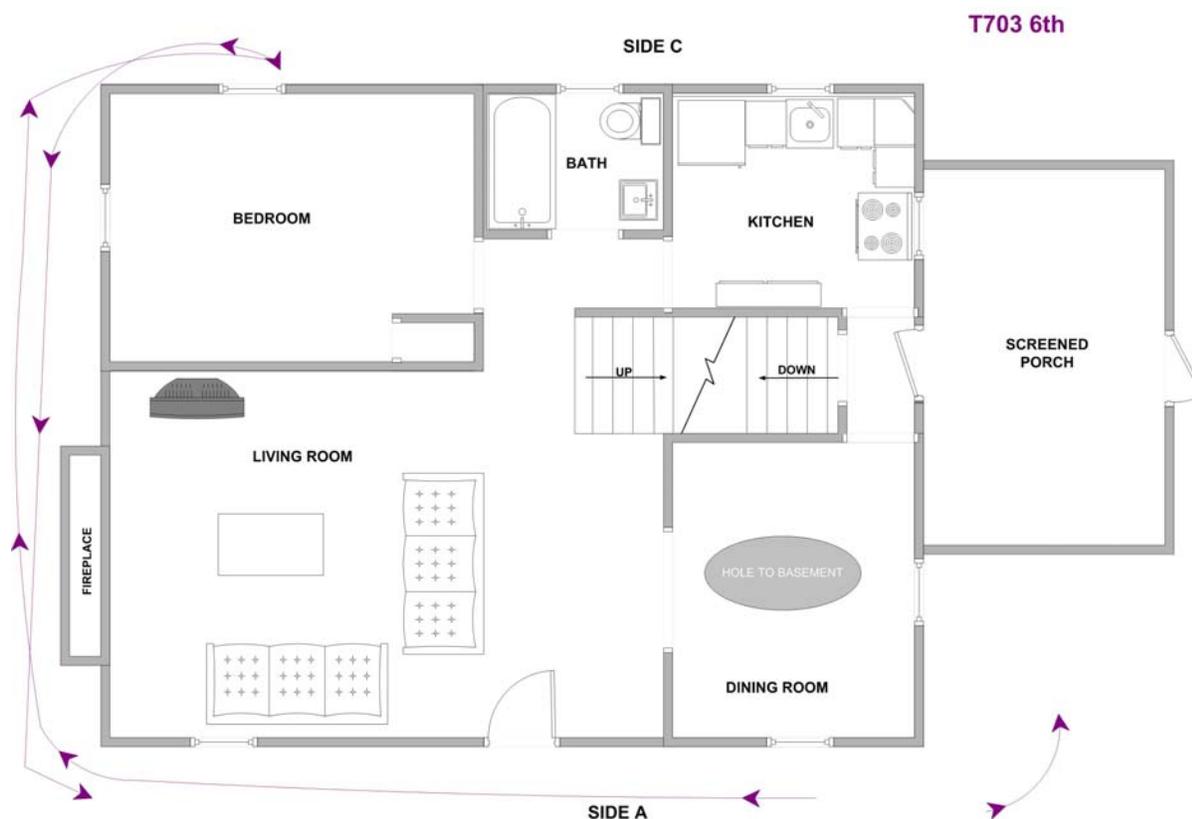
Upon arrival, T703 6th exited the apparatus in full turnouts, face piece, and hand light but no portable radio. T703 6th did not receive any orders from the T703 Officer. T703 6th moved quickly to the rear of T703 and observed a ground ladder being removed from T703 by another crew member. After this ladder was removed, T703

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6th removed a 28 foot ground ladder and placed it at a window location to the second floor SIDE CHARLIE of the building. T703 6th then returned to T703 to assist other personnel with the removal of another ground ladder.

At this point, T703 6th noted the arrival of Engine 721 at the rear of T703 and decided to obtain a SCBA from that unit. With SCBA donned, T703 6th returned to T703, retrieved a halligan bar and axe and moved toward the fire ground. T703 6th encountered a Rockville City police officer, who is also a Rockville VFD member, who advised that scene lighting was needed on SIDE CHARLIE of the building. The Police Officer removed two portable lights from T703 and began walking them to SIDE CHARLIE of the building. T703 6th assisted in spooling out the electric cord that was connected to the lights, then removed a porta-light unit from T703 and began walking this equipment toward the SIDE DELTA of the building through an entrance in the yard fence.

Figure 26: T703 6th's Path



While approaching the building, T703 6th observed a fire fighter exiting the basement window in Quadrant Delta. The fire fighter was partially out of the window to

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approximately the chest level. T703 6th dropped the porta-light equipment and ran to the area along with several other personnel. T703 6th was the first to lay hands on the fire fighter and with the help of other personnel, pulled the fire fighter from the building. As the rescuers were removing PPE from the fire fighter, T703 6th recognized the member as the RS703 Driver. The remaining actions of T703 6th centered on assisting with the medical care and transport of the RS703 Driver.

Prior to observing the RS703 Driver exiting the basement window, T703 6th was not aware of the Mayday situation. This was due to not having or being assigned to a crew with a portable radio.

RS703

On the evening of the Frederick Avenue incident, RS703 was utilizing the regular RS703 configured for five riding positions, with five SCBA's and three portable radios.

Rescue Squad 703 Driver

Approaching the scene RS703 Driver observed E703's supply being advanced. Upon arrival on scene RS703 Driver began to don full PPE less portable radio.

RS703 Driver ran up to the house and observed people donning SCBA face pieces.

On basement fires, RS703 Drivers normal practice with RS703 Officer was for the driver to control the utilities, exterior or interior, then enter and initiate a primary search of the highest level/floor, working down to the lower floors. Concurrently the Officer would enter and initiate a primary search of the basement and then work up to the higher level/floors.

RS703 Driver and RS703 Officer conferred on the plan prior to initiation their operations. During a circle check RS703 Driver observed windows being ventilated on SIDE CHARLIE. RS703 Driver attempted to ventilate a basement window without success due to window's construction. RS703 Driver noted a glow and smoke coming from the SIDE DELTA basement window.

RS703 Driver returned to SIDE ALPHA and entered immediately after the hose line crew (E703). Upon entering, RS703 Driver traveled to the left in the entry area and had to avoid a large object in order to get to the stairs to the 2nd floor.

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Once on the 2nd floor, RS703 Driver discovered a large amount of domestic goods that impeded the search efforts. RS703 Driver began a rapid right hand search pattern due to the concern of operating alone. RS703 Driver reported a “warm” level of heat and thick smoke conditions while searching the 2nd floor.

When RS703 Driver completed the search and began to return to the 1st floor, RS703 Driver attempted to radio a status report of the search and then discovered the portable radio was not part of his PPE.

On the 1st floor RS703 Driver encountered a large table that had to be moved out of the way. RS703 Driver and an unknown fire fighter moved the table aside. RS703 Driver described a “crowd” of people in the entryway/dining room area. RS703 Driver began grabbing fire fighters and asking their unit/name. Depending on the answer RS703 Driver either advised each person to continue with their duties or to get out.

While on the first floor, RS703 Driver encountered RS703 Officer and reported that a rapid primary on the 2nd floor was complete. RS703 Officer acknowledged this and was informed RS703 Driver would begin a secondary search on the 1st floor.

RS703 Driver performed a secondary search on the 1st floor with the exception of the kitchen and then returned to the dining room where RS703 Driver found a hose line and E703 Left operating a nozzle. RS703 Driver observes fire “licking” out of the basement stairs right over their heads.

RS703 Driver instructed E703 Left to open the nozzle on a wide fog pattern and apply water on the fire. E703 Officer then joins RS703 Driver and E703 Left. RS703 Driver questions E703 Officer why they are not advancing down the stairs and is advised that there is an exterior entrance and that E703 has been instructed to hold the top of the stairs. After conversing with E703 Officer, RS703 Driver turns around and observes E703 Left hydraulically ventilating and heavy fire is coming up the stairs.

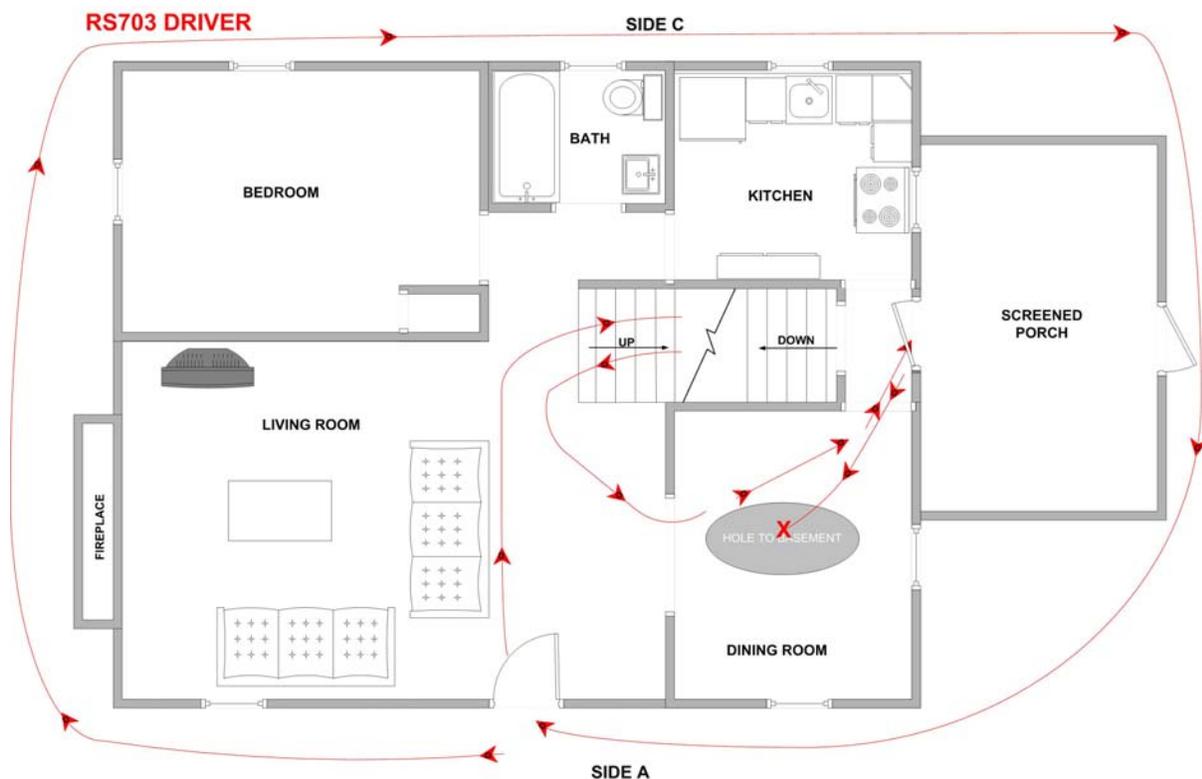
RS703 Driver then redirects E703 Left to flow the hose line at the fire advancing up the stairs. At this time RS703 Driver moves behind E703 Left and directly in front of the SIDE DELTA exterior door. RS703 Driver reported sitting on the window ledge, actually exterior door glass pane, and E703 Left was kneeling on the floor.

RS703 Driver instructed E703 Left to direct a wide fog into the stairs to keep the fire from advancing up the stairs. At this point, RS703 Driver leans out the window and sees “heavy” fire blowing out the SIDE DELTA Quadrant Delta basement window.

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RS703 Driver advised E703 Left if they have to rapidly exit the structure, there are two windows they can exit by. RS703 Driver advised E703 Officer there was heavy fire coming from the basement window right below E703 Officer's feet and that they all needed to back out of the building. E703 Officer advised the floor was spongy. RS703 Driver felt that as the hose line crew exited, RS703 Driver would be the last member out.

Figure 27: RS703 Driver's 1st Floor Path



As RS703 Driver walked out across the dining room, RS703 Driver felt one foot go through the floor and then the other. RS703 Driver tried to head for the 1st floor SIDE DELTA window to bail out but could not get free from the hole. At that point, RS703 Driver yelled "MAYDAY." RS703 Driver tried to slowly self extricate from the hole but continued to sink into the hole, falling down to the armpit level. RS703 Driver tried to pull on the hose line to get out and summon help but was not successful. RS703 Driver decided to take the hose line down into the hole for protection.

RS703 Driver did not think anyone heard the calls for help and stopped yelling MAYDAY to prevent another fire fighter from trying to initiate a rescue and getting trapped in the hole as well. RS703 Driver decided climbing out was not an option and since RS703 Driver's legs were burning, the only option left was to drop down to

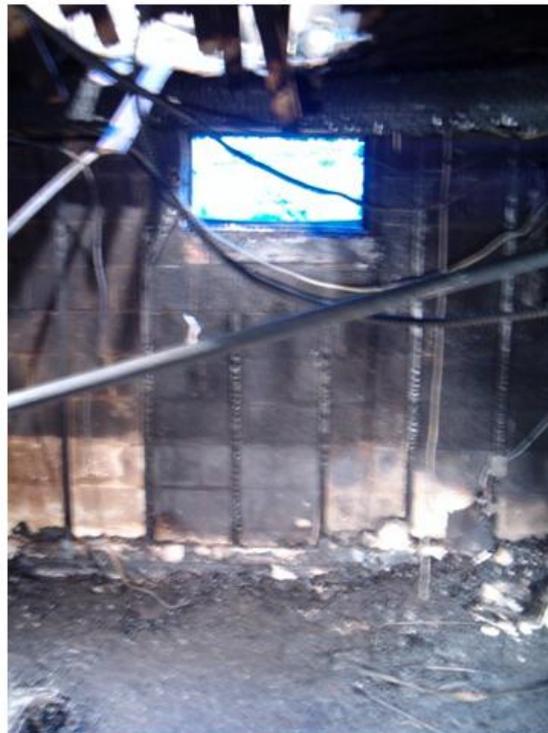
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the basement. RS703 Driver was able to control the drop and lower down until standing on the basement floor.

Note: The basement floor is covered with several inches of debris.

RS703 Driver had the impression the fire had just been knocked down but was not extinguished at that point. There was a lot of radiant heat without open flames. RS703 Driver recalled from the circle check there were basement windows and attempted to find the windows. RS703 Driver turned 90 degrees to the right, took a few steps and found the SIDE DELTA window.

Figure 28: Basement Bedroom toward SIDE DELTA Window



RS703 Driver walked up an incline of debris under the window. The window was at chest level to RS703 Driver. RS703 Driver found a bar across the window and pulled it out by “shaking” it. RS703 Driver felt a “pinch” type injury to the right pinky finger while removing the window frame. While experiencing significant heat and feeling as

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if “melting” RS703 Driver tried two or three times to get out of the window. RS703 Driver felt it was the SCBA that prohibited exit through the window.

Figure 29: Basement Window



Note: The window is 16” tall and 31” wide and the bottom of window is 65” from clean floor.

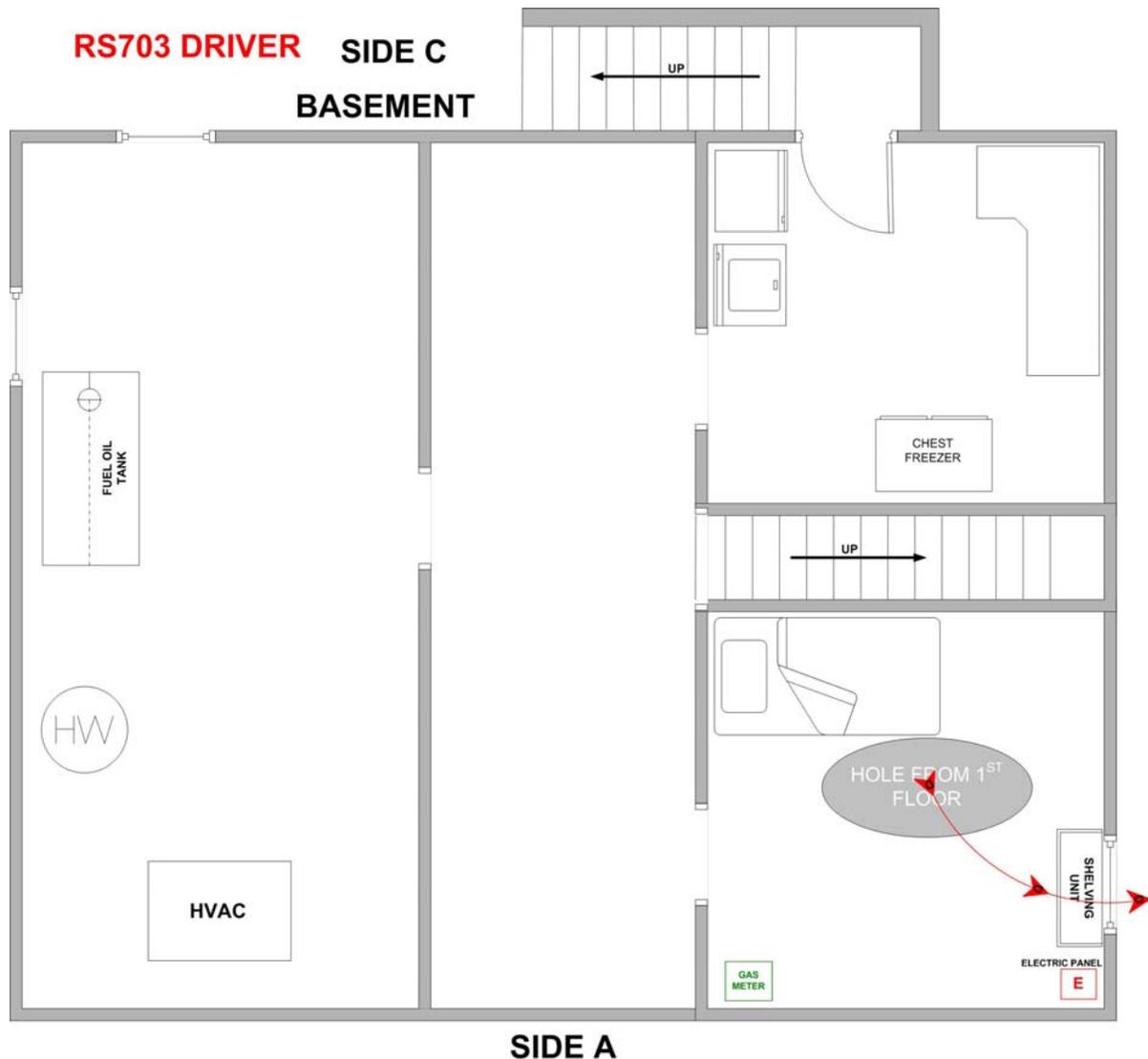
While still breathing from the SCBA, RS703 Driver removed the SCBA harness and cylinder and stuck it out the window hoping someone would see it. RS703 Driver did not know if anyone had heard the cries for help. RS703 Driver described that everything was silent in the basement; RS703 Driver thought everyone had been evacuated resulting in RS703 Driver being the only one in the building, and that no one knew RS703 Driver was in trouble.

Note: At no point in the fire fighter self rescue did RS703 Driver activate the PASS device on the SCBA.

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RS703 Driver tried to get out the window again after taking off the SCBA, but the helmet hit on the window opening. RS703 removed the helmet and again tried to exit the window by doing a “swim motion” through the window.

Figure 30: RS703 Driver's Basement Path



RS703 Driver was successful in getting half way out the window, ripped off the SCBA face piece and hood, and was yelling “MAYDAY.” A fire fighter, T703 6th, who had been throwing ladders, heard RS703 Driver and assisted the fire fighter out of the window assisted by others. RS703 Driver’s PPE was removed with the

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assistance of other fire fighters on scene and taken to Medic 723 for ALS care and transport.

Figure 31: SIDE ALPHA/DELTA Corner - Approx Time 01:52



Rescue Squad 703 Officer

While arriving on-scene E703 Driver radioed to have the Rescue Squad charge the hydrant.

01:39:09 E703 Driver

Squad make sure the hydrant's charged.

RS703 Officer observed that a fire fighter was at the hydrant and the supply line was being charged.

Upon arrival on scene RS703 Officer exited the apparatus in full PPE. RS703 Officer instructed the crew to don SCBA face pieces and remain on SIDE ALPHA while the officer performed a circle check. RS703 Officer performed a circle check and did not

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notice the SIDE CHARLIE exterior basement entrance due to the darkness, lack of railing, and tall grass. Upon returning to SIDE ALPHA, RS703 Officer met up with E703 Officer. E703 Officer instructed the rescue squad crew to ventilate the building. RS703 Officer began ventilating first floor windows on SIDE ALPHA Quadrant Alpha and then proceeded around SIDE BRAVO to Charlie ventilating windows.

On SIDE CHARLIE RS703 Officer met up with RS703 Right and finished venting windows on SIDE CHARLIE. RS703 Officer then returned to SIDE ALPHA and donned the SCBA face piece and then entered with RS703 Right and RS703 Left into the first floor, following E703's hose line to the right.

As the result of delays in hose line advancement due to furniture, RS703 Officer passed E703's crew and continued in a right hand search pattern looking for the basement stairs. RS703 Officer found the top of the basement stairs on the first floor Quadrant Charlie, returned to E703 Officer to advise the location of the stairs, and led them to it. At this time fire was licking up the stairs.

Upon hearing command assign E703 as the Basement Division RS703 Officer radio command

01:44:28 RS703

Rescue Squad 703 to command - We have located basement steps - the engine is preparing to make entry down the basement

At this time Chief 703 radioed command that there was an exterior entrance

01:44:44 C703

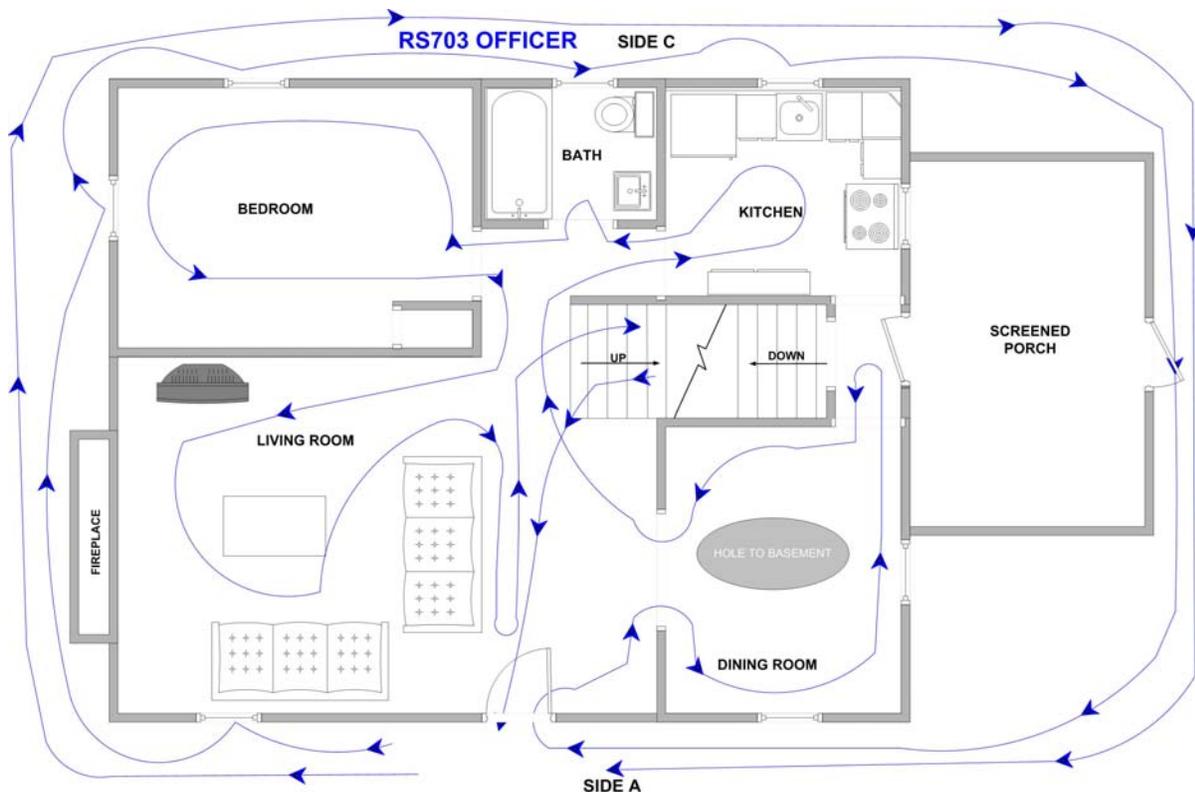
Chief 703 to command - you have a rear entrance to the basement?

After finding the interior basement stairs and the identification of the exterior entrance, RS703 Officer and crew left E703 Officer and E703 5th and began a right hand search pattern of the first floor.

RS703 Officer and crew completed the search of all first floor rooms and located the stairs to the 2nd floor. RS703 Officer and crew went upstairs and performed a quick primary search. At the top of the 2nd floor stairs, RS703 Officer did a quick verbal check to confirm RS703 Right and RS703 Left were still all together.

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Figure 32: RS703 Officer's 1st Floor Path



RS703 Officer advised RS703 Right and RS703 Left that they were going to go down stairs, exit the structure, and proceed to the rear basement entrance and join up with E723. RS703 Officer stated that transmitting this message via radio was unsuccessful due to radio chatter. Upon exiting the building, RS703 Officer advised Division 1 that the primary search on the 1st and 2nd floor was complete. Upon arrival on SIDE CHARLIE E723's crew is observed donning SCBA face pieces.

While on SIDE CHARLIE, RS703 Officer believed that T703 Right join the crew and entered the basement. RS703 Officer believed this action caused RS703 Left to remain outside until RS703's crew returns.

Upon entering the basement, RS703 Officer observed the fire and E723 extinguishing it in several areas just before the 2nd Mayday is transmitted.

At that time RS703 Officer removed a glove to change radio talk groups and switched to 7-Delta as instructed by Command. RS703 Officer heard a PASS device sounding from Quadrant Delta.

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The following radio transmission indicated a fire fighter had fallen through the floor in Quadrant Delta.

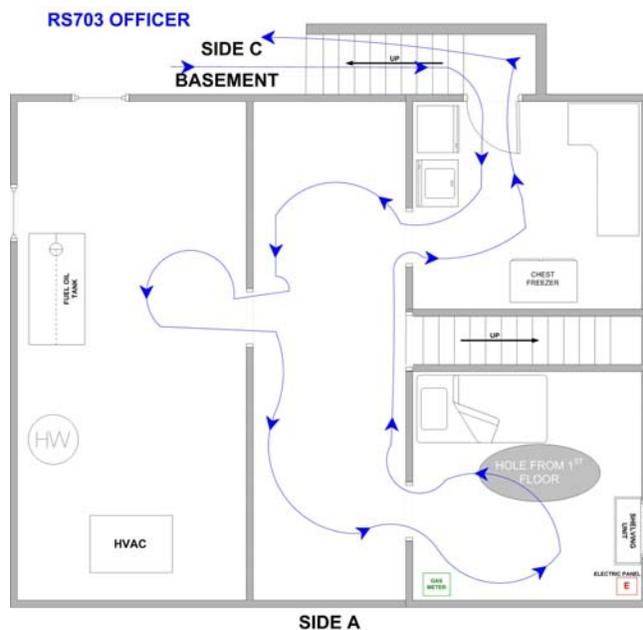
01:54:24 BC703

Battalion 703 to Command your Mayday is occurring in the Delta Quadrant of the first floor, have one fire fighter that has come out the window, being taken to medical treatment. Have crews opening, entering Division 1 SIDE DELTA for the Mayday.

RS703 Officer immediately proceeded to the bed room and was able to stand up and put a hand through the hole in the floor and feel the collapse and found nothing. RS703 Officer then dropped down to the floor and searched the entire room. RS703 Officer proceeds to search the interior stairs and found nothing. Upon entering the room the PASS device sound had stopped.

RS703 Officer met up with E723 Officer and began to perform a crew accountability check and attempted to transmit a PAR on the radio without success due to heavy radio chatter. RS703 Officer leaves the basement via the exterior doorway to learn what was going on and to advise that their crews were accounted for.

Figure 33: RS703 Officer's Basement Path



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RS703 Officer met a command officer outside that was believed to be Battalion 703 or Chief 703. The chief advised RS703 Officer that the mayday fire fighter was rescued. The chief officer asked RS703 Officer for the unit's accountability. RS703 Officer returned to the basement to perform a complete personnel accountability report (PAR). RS703 Officer confirmed with E723 and E725 Officer that each crew was intact.

RS703 Officer returned outside and advised that E723, E725 and RS703 were PAR. At that time, RS703 Officer was told that the mayday fire fighter was RS703 Driver. RS703 Officer and crew proceeded to locate the medic unit and obtain a status report on RS703 Driver.

RS703 Officer and RS703 Right, returned to the rescue squad to perform a quick crew assessment. RS703 Officer assumed that due to the fire conditions and the location of the utilities that they would be un-successful in controlling the same.

Rescue Squad 703 Right

Upon arrival on scene, RS703 Right exited the apparatus in full PPE and attempted un-successfully to bring the thermal imager. RS703 Right observed E703's crew was assembling at the front door and heavy smoke was pushing from the 2nd floor windows and fire was visible from the SIDE DELTA basement window.

E703 Officer instructed RS703's crew to ventilate the building. RS703 Right began ventilating first floor windows on SIDE ALPHA Quadrant Alpha and proceeded around SIDE BRAVO to CHARLIE ventilating windows.

On SIDE CHARLIE RS703 Right met up with RS703 Officer and finished venting windows on SIDE CHARLIE. At that time RS703 Right was not aware of the location of RS703 Left or RS703 5th. RS703 Right returned to SIDE ALPHA with RS703 Officer.

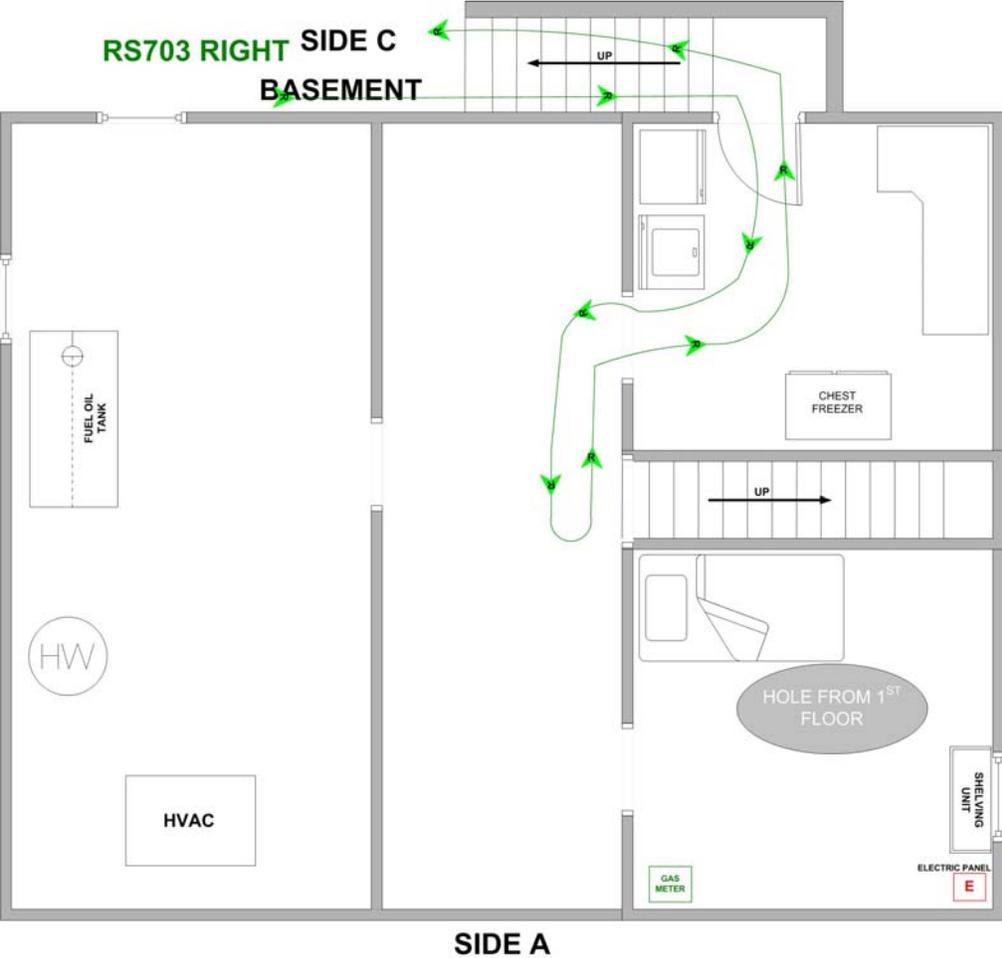
RS703 Right entered the first floor with RS703 Officer and presumably RS703 Left and RS703 5th. At time of entry RS703 Right observed one hose line entering the front door and being deployed toward the right. RS703 Right entered with RS703 Officer but immediately became separated and did not know the location of the other members from RS703. RS703 Right began to perform a left hand search pattern alone. RS703 Right moved furniture in the living room, Quadrant Alpha, and encountered a lot of debris in the room. Heat in this area was minimal at this time while visibility was very limited.

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E723, RS703 Right accompanied RS703 Officer to a location where RS703 Officer could communicate by radio after trying unsuccessfully to make a transmission from the basement due to heavy radio traffic. At that time RS703 Right heard the initial MAYDAY declaration radioed and tried to tell RS703 Officer. Before this could be accomplished, the second MAYDAY transmission occurred and Command orders all units switch talk groups.

RS703 Right switched to talk group 7-Delta and followed RS703 Officer and E723's crew towards the fire room, but before entering the room, the order came to exit the building. RS703 Right exited via the exterior basement stairs. RS703 Right went to C703 in the yard and found out that RS703 Driver was injured and had self-

Figure 35: RS703 Right's Basement Path



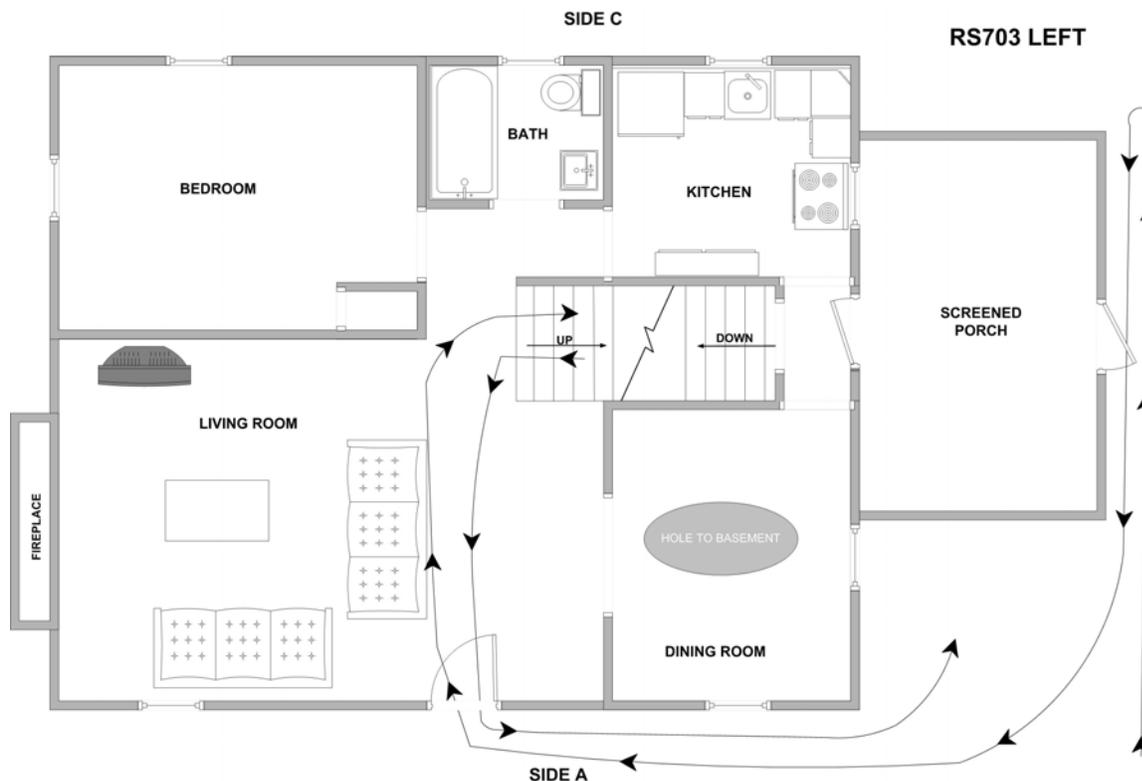
extricated. RS703 Right accompanied RS703 Officer to SIDE ALPHA where they found and reunited with RS703 Left and RS703 5th.

Rescue Squad 703 Left

Upon arrival, RS703 Left exited the apparatus in full PPE and without a portable radio. RS703 Left observed heavy smoke coming from the house and as the building was approached RS703 Left noticed fire from the basement window on SIDE DELTA. RS703 Left carried a set of "irons" but no light. RS703 Left and RS703 5th remained in the front yard while RS703 Officer and Right went around the building venting. RS703 Left entered the building from SIDE ALPHA following RS703 Officer. RS703 Left began a left hand search pattern. At this time RS703 Left lost contact with other members of RS703 until encountering RS703 Officer enroute to the second floor where RS703 Left rejoins with RS703 Officer and RS703 Right.

On the 2nd floor, RS703 Left began a right hand search pattern with RS703 Officer but again lost contact with RS703 Officer and RS703 Right. While searching, RS703 Left has a door shut behind the search path. When RS703 Left opens the door, RS703 Left unsuccessfully attempts to find RS703 Officer. RS703 Left heads downstairs and finds a hose line and follows it to the front door.

Figure 36: RS703 Left's Path



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On the way to the front door, RS703 Left heard the cracking of the floor and heard what RS703 Left believed to be RS703 Driver saying “**MAYDAY MAYDAY**, steam burns, steam burns!” RS703 Left observed everyone leaving Division 1 and stated an order was given for RS703 Left to go back in and help, but RS703 Left elected not to do so. RS703 Left assisted with the removal of RS703 Driver’s gear. While assisting with the gear removal RS703’s Left hand was burned when touching the D ring on RS703 Driver’s rescue harness.

Rescue Squad 703 5th

NOTE: The SIIG was unable to interview this crew member after multiple attempts. The information below is gleaned from statements of other personnel

Rescue Squad 703 5th was seen on the nozzle of the second attack line.

E723

On the evening of the Frederick Avenue incident, E723 was utilizing the regular E723 configured for five riding positions, with five SCBA’s and four portable radios.

Engine 723 Driver

En-route E723 Driver requested E703 for supply line instructions and was advised:

01:38:09 E723 Driver

703 you got water supply yet?

01:38:13 E703

That’s correct we just got it, Engine 703 to Montgomery, I got command 1 1/2 story single family - got fire in the basement. Our line is on Lenmore Ave. just off Frederick, Have the 2nd engine pick it up. Truck 3, Truck 703 is my 2 out.

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01:38:44 E723 Driver

Where was your line on Frederick Ave?

01:38:50 E703 Officer

Its on Lenmore just off Frederick.

01:38:54 E723 Driver

E723's got it.

E723 planned to approach Frederick Avenue and Lenmore Avenue from the North Horners Lane side then pass the scene and turn left on Lenmore in order to enhance the water supply at E703's hydrant. Upon arrival E723 could not pass E703 on Frederick Avenue.

At this time E723 Driver was instructed by E723 Officer to hand advanced 300' of 4" supply line back to the corner of Frederick Avenue and Westmore Avenue and to provide water supply to E703.

For the next roughly seven minutes, E723 Driver assisted in deploying hose lines from the engine and completing the supply line advancement. During this period E723 Driver attempted twice to get radio air time to request the hydrant at Frederick Avenue and Westmore Avenue be charged.

01:46:07 E723 Driver

E723 to Command.

01:46:42 E723 Driver

Pickup my line on Westmore.

As the hose lines are being deployed from E723 and stretched to tactical assignments there are several radio transmissions requesting they be charged.

01:50:43 E725

Engine 725 to E723's driver charge that 2nd line.

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01:50:55 E723 Driver

[Feedback] **Can't charge it till I get water on it --they wanna go in.**-[background]

As Battalion 704 is arriving on scene and being assigned to the Safety Officer position, Battalion 704 identifies that an un-charged supply line remains from the hydrant at Frederick Avenue and Westmore Avenue.

01:51:11 Safety

Safety to Command.

01:51:14 Command

Go ahead Safety.

01:51:17 Safety

Whatever unit laid out from Frederick and Westmore, nobody picked up their line yet.

Command attempts to assign this task to E733 but they are committed to E721's hydrant.

Less than 2 minutes from the last attempt to have E723 charge the second hose line SIDE CHARLIE repeats the request.

01:52:16 SIDE CHARLIE

SIDE CHARLIE to Engine 723, charge that second line please.

This request is repeated by Command just 19 seconds before the first Mayday is called.

E723 Driver met face to face with, and instructs E725 Driver to enhance the water supply E723's at the hydrant at Westmore Avenue and Frederick Avenue. E723 Driver was at the pump panel when the Mayday was called.

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Engine 723 Officer

En-route E723 Officer and Driver planned to approach Frederick Avenue and Lenmore Avenue from the North Horners Lane side and then pass the scene and turn left on Lenmore Avenue in order to pickup E703's hydrant.

Upon arrival E723 could not pass E703 on Frederick Ave due to E703 and parked cars. At this time, E723 Officer advised the driver to hand advance a supply line back to the corner of Frederick Avenue and Westmore Avenue. Upon dismounting the apparatus, E723 Officer instructed the crew to pull a leader line and the standpipe pack.

E723 Officer did a face-to-face with E703 Driver and passed on the new water supply information. E703 Driver told E723 Officer that E703 Driver had already pulled a 2-inch line to the front for E723 to use as the backup line. E723 Officer did a circle check of the structure. E723 Officer found the 2 inch line on SIDE ALPHA of the structure but the hose line was inside the building and the nozzle was not in sight.

Figure 37: SIDE ALPHA - Approx Time 01:44 hrs



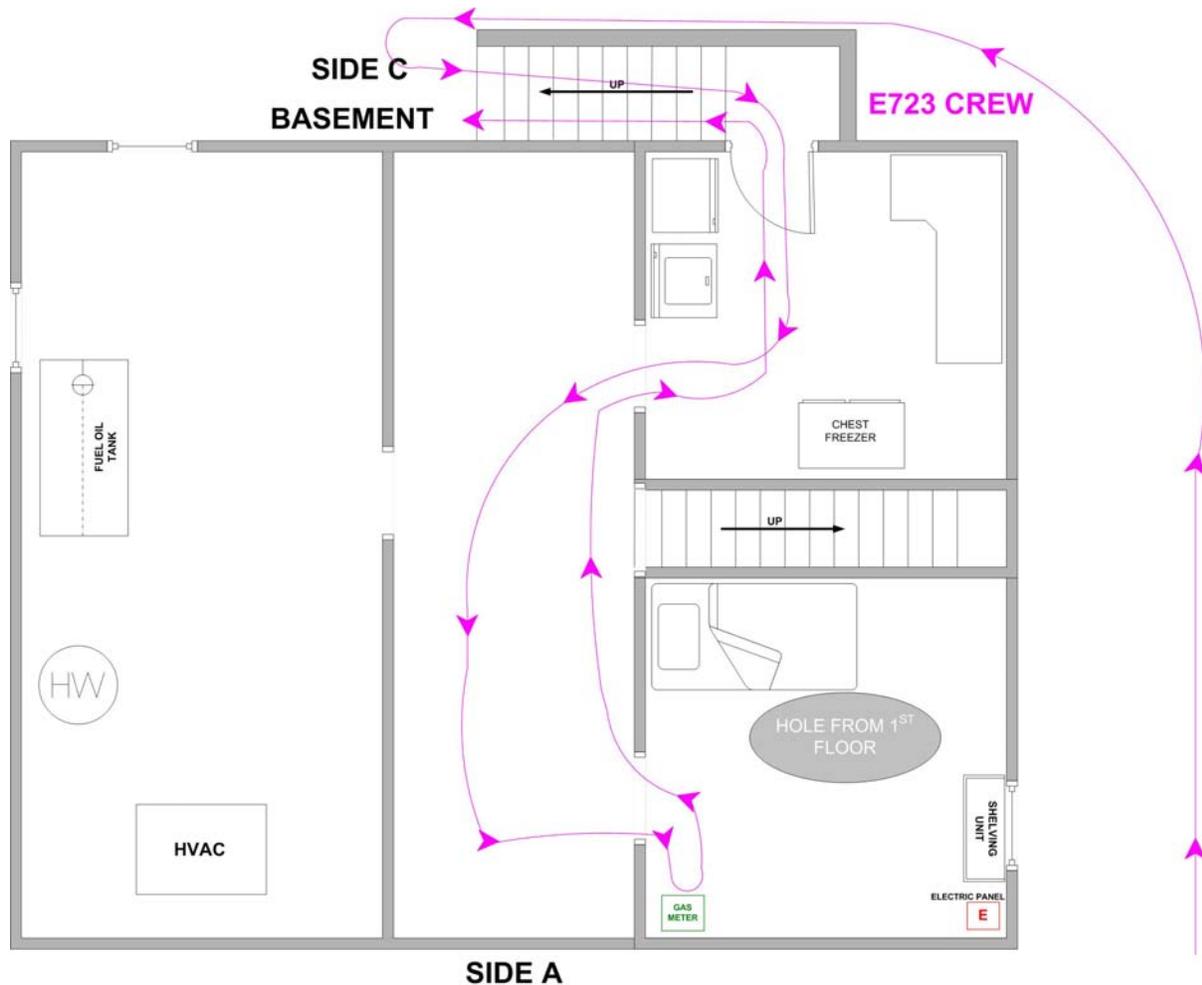
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At this time Command advised E723 to become part of Basement Division

01:44:13 Command

You will be Basement Division; You will have Engine 703, Engine 723, and Truck 703 in your Division.

Figure 38: E723 Crew's Path



Once the exterior basement entrance was found, Command changed the tactic and advised E703 to hold the 1st floor at the top of the stairs and that E723 would enter via the SIDE CHARLIE basement entrance.

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01:44:50 Command

Command to Engine 703 there is a rear entrance to the basement - go ahead and hold up and I will have Engine 723 pull a line in to protect the steps.

This was acknowledged by E723 Officer at

01:45:25 E723 Officer

Yes line to the front door - protect the stairs correct?

The confusion was then clarified by command and acknowledged by E723 Officer

01:45:30 Command

That's negative I think I think Engine 703 has a line protecting the stairs - I think I need you to go to the rear - and make entry in the rear - there's a rear entrance - basement fire.

01:45 E723 Officer

Copy rear – line.

E723 Officer instructed the crew to pull an 1 3/4-inch line off of E723 to SIDE CHARLIE. The crew advanced their hose line to SIDE CHARLIE via SIDE DELTA. On SIDE CHARLIE the crew advanced down the outside stairs and encountered two other fire fighters, determined to be T703 Right and an unknown fire fighter. E723 Officer told these other individuals to move so that they could make an attack on the fire.

E723's crew made entry into the basement via the SIDE CHARLIE stairs into Quadrant Charlie. Shortly after entering the basement the crew was met with flames rolling along the ceiling level down to the shoulder level at points. E723 Officer felt "pretty significant heat." E723's crew began to apply water to all visible fire as they advanced inside.

As the crew passed the interior stairs to the 1st floor, E723 members reported feeling water hitting them from their left. This was water from E703's hose line at the top of the stairs.

While flowing the hose line and advancing to the seat of the fire in Quadrant Delta, the Mayday was heard via the radio.

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E723 Officer ordered the line to shut down and for crews to be quiet to allow for focused listening for distress signals from the Mayday fire fighter(s). E723 Officer switched the portable to 7-Delta as directed by Command. E723 Officer did a quick accountability of E723's crew. A minute later, E723 started to hydraulically ventilate, clearing the smoke so that a quick sweep of the basement could be started. E723 Officer, using a hand tool, shut the gas off at the meter. Command asked E723 Officer for their PAR. E723 Officer claimed that due to excessive radio traffic, E723 Officer was unable to relay information to Command. E723 Officer did a face-to-face with RS703 Officer and asked the PAR status be relayed face to face.

COMMAND OFFICERS

Chief 703 Charlie – Command

At 0139 hours, Chief 703C arrived on the scene and assumed Command and stated:

01:39:32 Chief 703C

Chief 703C on the scene assuming Command - have fire showing on SIDE DELTA, alpha Quadrant.

Command queries E703 to see if there is a rear entrance. At 0144 hours Command assigns the Basement Division:

01:44:13 Command

You will be Basement Division; You will have Engine 703, Engine 723, and Truck 703 in your Division.

RS703 Officer reports to Command that:

01:44:28 RS703

Rescue Squad 703 to command - We have located basement steps - the engine is preparing to make entry down the basement.

C703 advises Command that there is a rear entrance at 01:44:44 hours.

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01:44:44 C703

Chief 703 to command - you have a rear entrance to the basement.

Command advises E703 to hold up and orders E723 to pull a line to protect the stairs. This order causes confusion for E723's Officer who is heading towards Division 1 to hold the basement stairs. Chief 703F was assigned as the Division 1 supervisor by Command at 0147 hours.

At 0148 hours E723 calls Command to confirm the assignment of E723 is going in the front door or to the rear.

01:48:16 E723

Engine 723 to command - I need a confirmation on my orders - am I going in the front door or am I going to the rear.

Command instructed E723 Officer to

01:48:25 Command

Command to Engine 723 you are going in the rear - in the back - basement entrance - you will be basement division - you and tower - Is Tower 723 with you?

Command assigns BC703 as the Basement Division Supervisor at

01:49:23 Command

Battalion 703 Please take basement Division.

At 01:52:41 hours, a point believed to narrowly coincide with the fire extinguishment, a muffled Mayday announcement was heard over talk group 7-Charlie.

01:52:41 T703

Mayday, Mayday, Mayday.

Command attempted to verify this transmission.

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01:52:47 Command

Command to the last message, repeat?

Immediately, Division 1 reported that the first floor had failed and units were backing out.

01:52:52 Division 1

Division 1 to Command. The floor has given way on the first floor; I'm backing the guys out of Division 1 at this point.

At 01:53:22 hours, T703 Officer transmitted the second Mayday.

01:53:22 T703

Mayday, Mayday, Mayday, this is Truck company 703.

01:53:32 Command

Command to Truck 703, go ahead with your Mayday.

01:53:37 T703 Officer

Through the floor, at this time all I can tell you is we have several unaccounted for.

Command is unable to respond to T703 Officer's transmission due to Division 1's transmission.

01:53:50 Division 1

Division 1, Division 1, all units in Division 1, I need to you to back out now!

01:53:57 Command

Units on the fire ground, all units on the fire ground, switch to 7-Delta.

01:54:06 Command

Chief 703 Bravo will be on Delta.

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01:54:15 E703

Engine 703 to Command.

01:54:20 Command

Go ahead 703.

01:54:24 Basement Division

Battalion 703 to Command, your Mayday is occurring in the Delta Quadrant of the first floor. Have one fire fighter that has come out of window, being taken for medical treatment. Have crews opening, entering Division 1 SIDE DELTA for the Mayday.

01:54:43 Command

Command to Montgomery, let me have two medic units on the scene. All EMS units to SIDE DELTA, SIDE DELTA at this time.

01:54:51 ECC

Montgomery's direct.

01:54:53 Medic 723:

Medic 723 on the RID going to SIDE DELTA.

01:54:58 Rescue Squad 742:

Squad 742 to Command, I'm on the scene, I'll be approaching the house for the RIG.

One minute and 28 seconds after T703 Officers last transmission, Command attempts to raise the Mayday unit.

01:55:05 Command

Command to the Mayday unit, do you copy me, Command to the Mayday unit.

01:55:14 T703 Officer:

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This is Truck Company number 703.

01:55:23 Command

Can you give me your LUNAR?

Command never receives this information because multiple units provide additional information pertaining to the Mayday.

At 01:56 Command orders all units to switch to 7-Delta

01:56:28 Command

Command to all units on the fire ground, Command to all units on the fire ground, not, not on the Mayday, switch over to 7-Delta, all units on the fire ground not involved in the Mayday switch to 7-Delta.

At 02:03 Command provides an update to ECC

02:03:36 Command

Standby Montgomery um, as far I am being told at this time I just wanted to give you a heads up that we have a PAR, on all of the initial units, uh, as far as the injured fire fighter give me a couple of minutes and I'll get you the information.

Chief 703 – Division Charlie

Chief 703 responds on 7-Charlie at 01:38:02 hours and arrives on scene at 01:40:16 hours. C703 moves to the Command Post to assist with Command. During interviews, C703 stated seeing fire still coming from the structure and advised Command C703 would go and do a 360 of the house.

C703 arrives on SIDE CHARLIE at 0144 and advises Command that there was a exterior basement entrance on SIDE CHARLIE.

01:44:44 C703

Chief 703 to Command - you have a rear entrance to the basement.

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At 0145 hours C703 advises Command to call the gas company it looked like he had a gas fed fire in the basement.

01:45:55 C703

Call the gas company it looks like you have a gas feed fire or something in the basement that's flammable liquid.

Command assigns C703 to SIDE CHARLIE (Division Charlie) at 01:50:10 hours.

C703 then advises Command when Company 723 units are preparing to enter the basement and they have confirmed that units are holding the stairs.

01:51:01 Division Charlie

SIDE CHARLIE Command, 23 units are entering the basement now.

After the Mayday was called C703 assisted BC703 with accountability of the Basement Division and personnel on SIDE CHARLIE. C703 located the Officer from RS703 who was reported missing. C703 attempted to relay this to Command but, due to radio traffic was unable to and then proceeded to the CP to do a face to face with Command.

After learning that the injured fire fighter was a Rockville VFD members C703 left the scene to go to the burn center to check on the fire fighters welfare.

Chief 703 Foxtrot – Division 1

Chief 703F responded on 7-Charlie at 0140 hours from station 33's area and arrives on the scene and reports to the Command Post for an assignment. At 0147 hours Command advises E703 that C703F will be coming to E703's location soon to assume the Division. Command advises E703 and T703 will be in Division 1.

01:47:33 Command

That's E703, T703 will be Division 1 at the top of the steps you will have Chief 703F will be joining you in just a moment.

While approaching the building C703F noticed fire coming from the window on SIDE DELTA, Quadrant Delta and saw two hand lines going into the front door. At the

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front door C703F found very heavy smoke conditions with smoke at roughly 18 inches off the floor. C703F observed many fire fighters on the first floor.

C703F located T703 Officer and queried if they were ready for the fire attack to begin from the basement entrance. At 0150 hours Division 1 notifies Command that they were ready for the Basement Division to make the attack.

01:50:49 Division 1

Division 1 Command, there in, there ready for the basement attack, have them go ahead.

Figure 39: SIDE ALPHA/DELTA Corner - Approx Time 01:48 hrs



C703F noted feeling and hearing the fire attack taking place in the basement. Division 1 then went outside the building to SIDE DELTA to check on the progress of the attack. C703F noted the fire had darkened down. Upon returning to the 1st floor

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C703F met T703 Officer who said the floor had given way. T703 called the first Mayday at

01:52:41 T703 Officer

Mayday, Mayday, Mayday

01:52:52 Division 1

Division 1 to Command. The floor has given way on the first floor, I'm backing the guys out of division 1 at this point.

01:53:22 T703 Officer

Mayday, Mayday, Mayday, this is Truck company 703

Division 1 instructs T703's officer to try to reach in the hole in an attempt to rescue the personnel that may have fallen through. At 01:53:50 hours Division 1 orders all units operating on the Division to back out. C703F stated as the RIG was entering the structure, the RIG was informed about the hole in Quadrant Delta.

01:53:50 Division 1

Division 1, Division 1, all units in Division 1, I need you to back out now!

Command at 01:55:52 attempts to contact the Mayday unit for their LUNAR and Division 1 transmits over T703. Division 1 has units place a large table to block off access to the room where the hole is located.

At 0207 hours Division 1 reports he has an open gas meter with a heavy odor of gas in the front of the structure and is pulling people away from the structure.

C703F remains as the Division 1 supervisor until relieved and reports to the CP where C703F started working on the demobilization plan with the Duty Chief.

Chief 703 Bravo – Command Support

Chief 703B responds at 0140 hours from home and arrives on the scene and reports to the CP and assumes the Senior Advisor position. C703B asked Command for the

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tactical worksheet to review what was going on and started to write C703F into Division 1 when the Mayday was announced.

C703B recalls hearing the first Mayday but, then heard someone say something about a collapse. C703B wrote LUNAR on the sheet when the 2nd Mayday was transmitted by T703 and C703B shouted LUNAR and slapped C703C to get commands attention. C703B shouted and physically prompted (slapped) C703C again "LUNAR!" C703B told C703C "LUNAR, LUNAR, LUNAR, and to switch all units over and C703B would take Operations on Delta."

C703B started a second tactical work sheet for the units switching 7-Delta for operations and accountability. C703B advised Command to request 2 medic units. C703B stated that the Mayday happened so fast that it was over before all the units switched over to 7-Delta. C703B stated the PAR conducted was the units that were believed to be involved in the Mayday.

When the Mayday was completed, C703B was attempting to use the 2nd tactical worksheet to manage the incident after the Mayday. C703C resumed the Command of the incident and C703B started working with BC703 to finish the incident.

Battalion Chief 703 – Basement Division

BC703 responds on 7-Charlie at 0140 hours from Station 31. BC703 arrived on scene at 0149 hours and asks Command for an assignment. Command assigns BC703 to the Basement Division as the supervisor. BC703 acknowledged the assignment.

01:49:18 BC703

BC703 is on the scene, do you have an assignment?

01:49:23 Command

BC703 Please take basement division.

01:49:29 Basement

I copy basement.

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BC703 reports to the Basement Division after completing a circle check of the structure. As BC703 is donning the SCBA face piece BC703 head the crews in the basement making an attack on the fire. As BC703 enters the basement, the Mayday is transmitted. .

BC703 utilized a Thermal Imager to scan the basement and stated "he could see the fire in the basement was knocked and at least five personnel." BC703 advised that there was no apparent emergency in the basement.

BC703 exited the Basement Division and was told that a fire fighter was pulled out the window on SIDE DELTA. BC703 meets with Unit 2 and they attempt to determine which unit or units are involved in the Mayday.

At 01:54:24 hours BC703 calls Command on 7-Charlie and advises

01:54:24 Basement Division

BC703 to command your Mayday is occurring in the Delta Quadrant of the first floor, have one fire fighter that has come out the window, being taken for medical treatment. Have crews opening, entering Division 1 SIDE DELTA for the Mayday.

BC703 returns to the Basement Division to confirm no one else was missing and in an attempt to locate the officer from RS703 who was still unaccounted for.

At 0158 hours BC703 call Command and advised

01:58:15 Basement Division

We're moving everybody from the basement division at this time for the purpose of providing accountability, looking for one specific person...that I just found him, I believe at this point we are PAR.

BC703 calls Command again at 0159 hours on 7-Charlie

01:59:44 Basement Division

BC703 to Command, the basement division is PAR. With Engine 723, Engine 725 and the 2 remaining members from Rescue Squad 703 including [name redacted] who was one of the missing parties.

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After completing accountability several times BC703 goes around to SIDE ALPHA to confer with Division 1 and returns to the basement to ensure the gas and water are controlled and any remaining hot spots are extinguished.

Additional Command Officers

Several other command officers responded or operated on the fire ground during the incident. These personnel had not arrived on the scene, were making their way to the Command Post or had not advised they were even on the scene when the Mayday occurred.

Duty Chief 700 Bravo (DC700B) responds at 0139 hours from Station 10 and arrives at 01:52:12 hours.

Duty Chief 700 (DC700) responds on the incident and is approaching the command post when the Mayday occurs. DC700 assists the command team in the command post with additional resources from ECC and later starts the after action process.

BC704 is dispatched on the assignment at 0136 hours from Station 25 and arrives at 0149 hours and is assigned Safety. Safety calls Command at 0151 hours to advise there is an engine that has laid out from Frederick and Westmore and no one has picked up their line.

Safety 700 responds on the incident at 0140 hours and arrives with BC704 handling Safety. SA700 reports to Command and immediately begins conducting the Significant Injury Investigation.

Unit 2 has no record of responding on the incident however during the Mayday BC703 states "I assisted Chief (Unit 2) in determining what crew the Mayday came from and whether others were missing.

At 0159 hours on 7-Charlie Unit 2 calls command

01:59:11 Unit 2

[name redacted] ***were on RS703, they're all accounted for at this time, the officer of T703 has assured me his crew is now PAR, Copy.***

Command calls Unit 2 to query T703 and RS703 were the only people involved in the Mayday.

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01:59:26 Command

So, got T703, RS703 were the only people involved in this, in in this MAYDAY, correct?

Unit 2 advises

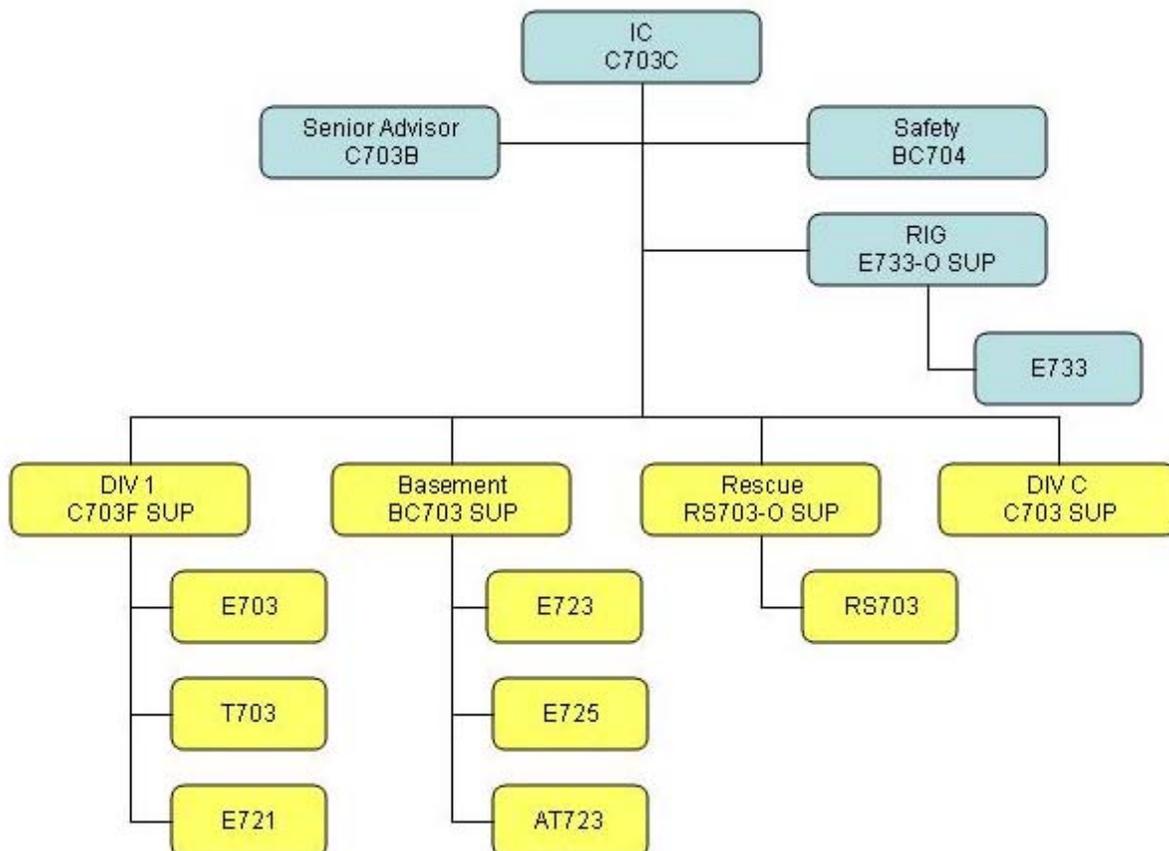
01:59:36 Unit 2

They were the initial; I'm waiting on, uh BC703 to advise further.

No other record of Unit 2 was found after this.

Event Organization Chart

Figure 40: Event Organization Chart



Operations

Response to structure fires in Montgomery County is defined in MCFRS Policy and Procedure 24-07AMII *SOP for Safe Structural Firefighting Operations (SSSFFO)*: dated December 1, 2005. This SOP provides standard response assignments for structure fires to ensure operational safety, effectiveness, and efficiency. The SOP outlines the department's basic fire attack strategy to incidents involving known or unknown life hazards and or rescues. The SOP does not dictate operations to events where life hazards/rescues are known not to be an issue or response to large commercial/industrial buildings. The SOP outlines response to operations involving rural water supply operations, high rise operations, and to standard single and multi-family residences.

The SSSFFO outlines the establishment of initial two-out, the expansion to a rapid intervention company (RIC), and then to a rapid intervention group (RIG). The policy also defines the actions that must occur when a member calls a Mayday as well as the Incident Commander's responsibilities.

TURNOUT TIME

Turnout time is defined by the National Fire Protection Association Standard 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (NFPA 1710)* as:

“The time beginning when units acknowledge notification of an emergency to the beginning point of response time.”

NFPA 1710 sets the standard for turnout time to be 60 seconds. MCFRS incorporated the 60 second turnout time into its response time goals of the 2005 Master Plan.⁵

⁵ *Fire, Rescue, Emergency Medical Services, and Community Risk Reduction Master Plan*, Montgomery County Fire and Rescue Service, October 11, 2005.

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E703 did not transmit an “en route” signal to communications until 2 minutes 36 seconds after dispatch.

Recommendation: MCFRS needs to monitor Turnout Time and take steps to achieve the goal of 60 seconds or less.

Two-OUT

After arriving on scene and discovering the basement fire, E703 Officer provided an on scene report and identified T703 as the two-out on talk group 7-Charlie.

01:38:13 E703 Officer

That’s correct we just got it, Engine 703 to Montgomery, I got command 1 1/2 story single family - got fire in the basement. Our line is on Lenmore Ave. just off Frederick , Have the 2nd engine pick it up. Truck 3, Truck 703 is my two-out.

T703 is still at Station 3 and had not marked up en-route. T703 stasured en-route verbally on 7-Charlie as the reserve aerial did not have an MDC.

01:38:57 T703

Truck 3 responding.

And

01:40:06 T703

Truck 3 responding.

During the interview process it was determined that T703 Officer was not aware that T703 was designated the two-out.

The SIIG analyzed the radio system affiliation log for 7-Alpha and 7-Charlie during the time of the event. After adjusting for differences in the time logs between the affiliation log and the radio transmission it is determined that T703 mobile radio affiliated on 7-Alpha at 01:37:52.

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Each and every time a radio changes talk groups it talks to the system controller and identifies itself and requests permission to operate on the specified talk group. This process is referred to as affiliation.

There is no record of T703 Mobile radio affiliating on 7-Charlie but T703 Mobile does transmit at 01:38:57 which corresponds to T703's first transmission of responding.

It is believed that the mobile radio on T703 was not on 7-Charlie when E703 identified them as the two-out.

On the scene, E703 Officer observes RS703 crew approaching SIDE ALPHA of the building and queried if they are T703. RS703 Officer advises no they were the rescue squad. During the interview process, RS703 Officer advised that upon seeing T703 arrive on scene E703 and RS703 entered the house.

01:41:04 T703

Truck 3 on scene.

As stated earlier T703 Officer was not aware of being assigned the two-out so upon arrival the crew engaged in interior and exterior operations but were not in place as required by MCFRS Policy and Procedure 24-07 AMIII *SOP for Safe Structural Firefighting Operations* two-out.

Recommendation: The initial entry team must not make entry unless a stand-by team is in place or as defined by SSSFFO. It is recommended that ECC or Command confirm critical orders are relayed by units that do not acknowledge their receipt.

Recommendation: It is recommended that unit officers be aware of available personnel on the scene that can be utilized as the two-out crew.

WATER SUPPLY

Fire ground operations are critically dependent on establishing a constant water supply for successful extinguishment. This may be accomplished by using tank water brought by responding engines/tanker/tenders, by a water shuttle operation, or by a pressurized municipal water supply.

De-Rated System

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As municipal water systems age, the capabilities to support the required 1,000 gallons per minute (gpm) fire flow is often reduced. This situation holds true for the Rockville Municipal water supply system.

In spring 2008 Rockville City began communicating with MCFRS on capacity problems within their system. Rockville City personnel provided MCFRS personnel with maps outlining hydrants with flow rates less than 1,000 gpm. These maps were distributed to all adjacent stations. Additionally, Rockville City personnel advised that hydrants rated less than 1,000 gpm would be marked with color coded rings on the 4 ½” steamer connection.

Battalion 703A, as the designated Rockville senior career officer and liaison to Rockville City, instructed all Rockville and neighboring stations to modify their apparatus based paper maps of any hydrants with less than 500 gpm.

The hydrant at 715 Lenmore Avenue was designated on the supplied maps as being rated to flow between 500 and 1,000 gpm. At the time of the fire, the promised color coded hydrant flow rings had not been installed.



The hydrant that E703 hooked up to was rated to flow 633 gpm with a residual pressure of 20 psi. The known limited flow capacity combined with the snaking “curb to curb” of the supply line contributed to the reports from E703 Driver that after charging two hand lines that the residual intake pressure was insufficient to support additional hand lines from E703.

The apparatus based paper map alterations implemented by Battalion 703A and the stations surrounding the core Rockville area are sufficient for the routine events but units beyond this area are un-familiar with the limitations of the water supply system.

RECOMMENDATION: Notification from water utilities pertaining to hydrant status must be accurately entered into CAD. This data must then be readily available to all responding units via premise information or Altaris, CAD mapping software, flagging. Any hydrant rated to flow less than 1,000 gpm should be flagged. Also, those hydrants that cannot produce 500 gpm should be identified with a ring.

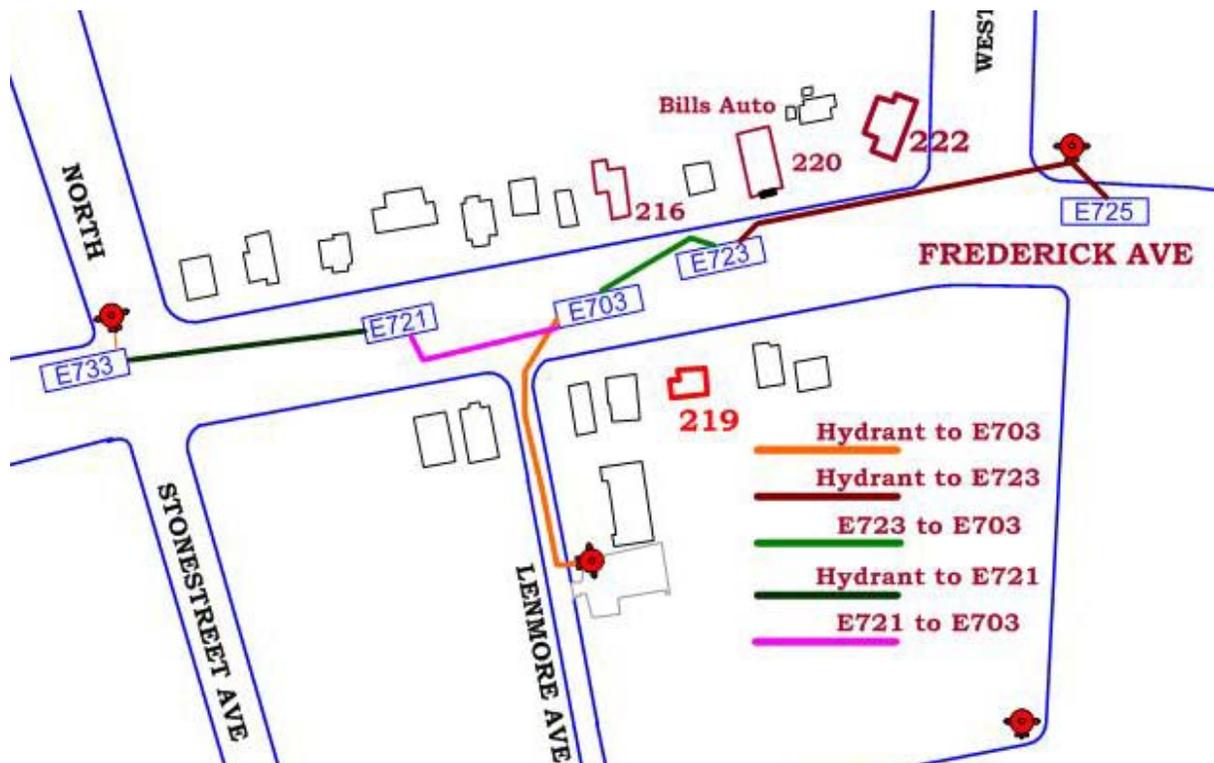
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Initial Water Supply

This event was dispatched as a single engine response for a transformer fire. In most cases, the engine officer does not look for a water source. Usually the engine officer checks for life safety, secures the area, and gives a pole number; but as Engine 703 arrived on the scene, they found a house on fire.

Once the actual problem had been identified, E703's Officer needed a water supply. E703 Officer then ordered E703 Right, E703 Left, and E703 5th to go look for a hydrant. E703 Driver proceeded down Frederick Avenue toward Westmore Avenue while the remaining crew from E703 looked down Frederick Avenue toward Lenmore Avenue. E703 6th found a hydrant in front of 715 Lenmore Ave. E703 crew members hand advanced 500 feet of 4-inch supply line up Frederick Avenue and then turned left onto Lenmore Avenue to the hydrant. They hooked it up using a Humat four-way valve, and charged it.

Figure 41: Water Supply Diagram



E703 Driver advised E723 of their layout instructions. E723's route of travel was north on North Horners Lane, a left onto Frederick Avenue with the thought of

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getting by apparatus already at the scene, and making a left onto Lenmore Avenue to pick up E703's line. However, with E703, T703, and civilian cars parked along the curbs, E723 was not able to get by. Knowing they were responsible for water supply, E723 Officer did a face-to-face with E703 Driver and made the decision to hand advance 300 feet of 4-inch supply line to the hydrant at the corner of Westmore Avenue & Frederick Avenue.

As E723 Driver hand advanced the supply line to the corner, E723 Driver did a face to face with the E725 Officer (5th due), and asked E725 Officer to establish the water supply for E723. E723 Driver also had a face to face conversation with E725 Driver to request E725 to open the hydrant and charge supply line.

The drivers of E703 and E723 had a brief discussion concerning the adequacy of E703's water pressure. E703's driver commented that the hydrant on Lenmore Avenue was not providing adequate residual pressure.

This water supply plan ensured E703 had an adequate water supply but required the utilization of a 3rd engine, E725 to pump E723's supply line. Additionally the time delay in getting E723's supply line charged delayed the charging of additional lines from E723 due to E723 operating off tank water to support the basement fire attack.

Recommendation: Unit officers must communicate to Command when they are unable to complete an assignment. While establishing an alternate plan face to face with critical parties solves the immediate problem, Command must be notified of deviations from SOP.

E721 (3rd due) route of travel was up north on Stone Street Avenue. E721 selected the hydrant at Frederick Avenue and Stone Street Avenue. E723 laid out 500 feet of 4-inch supply line east on Frederick Avenue toward the intersection of Lenmore Ave. Upon exiting the apparatus E721 Officer observed E703's supply line snaking "curb to curb" down Lenmore Avenue.

At this time E721 Officer assisted E721 Driver in advancing 100' of 4-inch supply line to E703. This supply line was to ensure that E703 had adequate water supply as E721 Officer was not aware of the actions of E723 to enhance E703's supply.

CREW EFFECTIVENESS

A good crew will be effective in its operations on the fire ground. Effective is defined by the Random House Dictionary as: “adequate to accomplish a purpose; producing the intended or expected result”. Crew effectiveness begins with crew integrity. Integrity is a concept, when followed, which allows crews to maintain the safest possible working environment in an IDLH. Early on in this incident on Frederick Avenue, crew integrity was lost. The dangers of the fire crews operating without crew integrity are so patently evident that it has become a safety requirement by regulation from OSHA, MOSH, and MCFRS Policies and Procedures. A crew cannot be judged effective if it is unsafe.

MCFRS Policies also set forth a list of fire ground functions performed by each unit for building fire incidents. In order for a crew to complete its assigned functions, the functions must be coordinated and commanded from department policy, incident command officers, and the crew leader. Crew effectiveness begins with crew integrity.

Crew integrity among units was lost early in this incident. In fact, crew integrity was almost completely absent right through the MAYDAY. Fire ground discipline, accountability and effectiveness are reduced when crew integrity is lacking. The crew leader is not aware of the actions of those members of their crew after members have separated from their crew leader. Although tasks can be completed by separated individuals, if no one in the command is aware of the actions of those rogue crew members, then coordination, and the checking off of those tasks as complete cannot be effectively done. Often fire fighters on this incident performed tasks in an IDLH which were already done by other fire fighters.

The following is an example from this incident of the lack of effectiveness and the problems created when a separated crew member attempts to complete a task on their own. A backup hose line was prepared for the use on the first floor by E703 Driver who had pulled it and left it at the front door. A detached member of another crew grabbed the hose line and advanced it into the first floor. E703 Driver told E723 Officer that the back up line for E723's crew was ready at the front door. E723 Officer went to find that hose line, but when E723 Officer saw the line had already been taken inside the building, E723 Officer did not know who had taken the line and if the backup task was being completed by another crew. Certainly command was not aware of who was operating that line.

This attempt to help interior operations by the rogue fire fighter who had taken that second hose line caused confusion. This was potentially disastrous to the safe operations on the fire ground. The line never physically made it into position to

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protect the first hose line. It was charged, was in the building, was manned, but it was almost completely useless. It was perhaps worse than useless, it could have been dangerous. Had it been needed, no one knew which crew to call to get it into operation. Had it been used in opposition to the first hand line, no one would know who to call to stop it. Command and the other units on the fire ground would probably have called E723 Officer if they wanted that hose line used or repositioned, etc. E723 may have caused a redundancy if they pulled another line to complete their assigned task and there would be two back up hose lines on the first floor. Fire fighters operating without the knowledge of the command structure above them, from their crew leaders to the incident commander, are creating dangerous situations for themselves and others. Unilaterally performing tasks assigned to other units is often not helpful or safe when done without the consent of command.

There were many examples of broken continuity and individuals operating without orders. Some fire fighters met up with other individuals and performed tasks on their own. Several fire fighters performed searches on their own; often covering areas already covered which is an ineffective use of resources.

There are often many operations which must be performed early in an incident. Often unit officers try to accomplish all of the tasks too rapidly. An effective crew must:

- Prioritize the assigned tasks
- Maintain crew integrity
- Accomplish the tasks safely
- Communicate completed or uncompleted tasks up the chain of command
- Not assume other unit's tasks without communicating this change

Speed should not be the driving factor in completing these operations. Safety is and should be the top factor in performing fire ground operations. The State MOSH requires the Authority Having Jurisdiction to create a work environment that is safe for fire fighters and the incident commander is also laden with that responsibility. No one can consider a task completed in an unsafe manner as being done well. Corporate culture must be changed as the sheer number of ineffective operations performed by so many scattered crew members happens. The scope of the problem indicates a corporate environment where crew separation is allowed to occur pervasively. This problem is not conducive to effective or safe fire ground operations. In order to create an effective crew, the crews must maintain unit accountability, unit integrity, communication, and crew safety.

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Recommendation: It is recommended that the unit officer: Prioritize the assigned tasks; maintain crew integrity; accomplish the tasks safely; communicate completed or uncompleted tasks up the chain of command; and not assume other unit's tasks without communicating this change

SSSFFO and Executive Regulation 26-04 *Personnel and Unit Accountability Systems* need to be modified to incorporate the tenets of this recommendation.

VENTILATION

On this event, E703 Officer broke several first floor windows and then directed RS703 Officer to complete the ventilation of first floor windows in preparation for hose line advancement and location of the interior basement stairs. These actions were consistent with a coordinated attack on a basement fire with no exterior entrance.

After being assigned to hold at the top of the basement stairs on the first floor, E703 performed hydraulic ventilation by flowing the hand line from the top of the basement stairwell out the SIDE DELTA exit door before the fire was contained. This tactic drew fire and heat up the stairwell. It was determined by the SIIG that this did not have an impact on the incident outcome; however this tactic could have caused unintended fire spread. Further, recognized training standards prescribe the use of hydraulic ventilation only when a fire has been contained.

Recommendation: Hydraulic ventilation must only be performed after the fire is confirmed to be contained.

VACANT/ABANDONED STRUCTURES

MCFRS SSSFFO Section IV b. requires the first arriving unit to give an Initial On-Scene Report, including: the arrival side of the building; number of its stories; the type of occupancy; conditions evident on arrival, with associated geographic location, using *Incident Command System* terminology; a request for additional resources; and if deviating from the SOP, designating other unit assignments.

E703 Officers initial on-scene report stated the house was reported vacant based upon information obtained from a neighbor. MCFRS does not have any policy or

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doctrine defining what a vacant structure is and how to strategically or tactically deal with said structure.

As part of an initial size-up of a structure, the first arriving officer must identify the strategic priorities to be accomplished and implement the necessary strategies to mitigate the problem. The seven basic strategies are referred to as Rescue, Exposures, Confinement, Extinguishment, Overhaul, Ventilation, and Salvage (RECEO + VS). These strategies are in priority of consideration. Along with this, a Risk/Benefit analysis must be conducted to determine if an interior or exterior attack would be a safer option for fire and rescue personnel.

Based on the initial on-scene report that the house was reported a vacant structure, rescue or the life safety of occupant's component of the strategic priorities becomes a lower priority and a direct attack on the fire would have been warranted.

Recommendation: MCFRS needs to define and develop SOP's for operations involving vacant, unoccupied, and abandoned structures. These SOP's must include risk/benefit analysis, marking the structure as abandoned, potential hazards within, maintaining a current and updated list of these structures in CAD and for personnel to access for response, training and knowledge.

COMMAND AIDE

NFPA, *Standard on Emergency Services Incident Management System* (NFPA 1561) "defines the roles and responsibilities to be assumed by responders and the standard operating procedures to be used in the management and direction of emergency incidents and other functions."

NFPA 1710 chapter 5 outlines that

"Supervisory chief officers shall have staff aides deployed to them for purposes of incident management and accountability at emergency incidents."⁶

⁶ NFPA, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments, Chapter 5 section 5.2.2.2.5*, 2004 edition.

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NFPA *Standard on Fire Department Occupational Safety and Health* (NFPA 1500) section 8.4.12

“The incident commander and members who are assigned a supervisory responsibility for a tactical level management component that involves multiple companies or crews under their command shall have assigned a member(s) to facilitate the ongoing tracking and accountability of assigned companies and crews.”⁷

COMMAND OFFICERS IN MONTGOMERY COUNTY

The County’s current dispatch algorithms for structure fire response include the dispatch of two career battalion chiefs and the alerting of the two closest LFRD duty officers.

The Operations Division Chief and Safety Chief have provided direction that the EMS Duty Officer and shift Safety Captain may respond on the initial dispatch if they are in close geographic proximity to the event.

Presently any LFRD command officer that wishes to the respond to the event may add themselves.

On the Frederick Avenue event, Chief 703C was still at Station 3 at time of dispatch and arrived very early in the event. The command officer response prior to the declaration of the mayday included:

Battalion 703 from Station 31	Battalion 704 from Station 25
Chief 703 from home	Chief 703B from home
Chief 703C from Station 3	Chief 703F from home
Chief 705D from Station 5	Duty Chief 700 from Station 20
Duty Chief 700B from Station 10	Safety 700 from Station 7
EMS702 from Station 20	

This large response of command officers allowed the incident commander to have assigned the following ICS functions prior to the mayday:

Chief 703C	Incident Commander
Chief 703	Division Charlie
Chief 703F	Division 1

⁷ NFPA *Standard on Fire Department Occupational Safety and Health* Chapter 8, section 8.4.12, 2007 edition

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Battalion 703	Basement Division
Battalion 704	Safety
Chief 703B	Command Team (in CP)
Unit 2	On-Scene

Within 13 minutes of arrival on scene the incident commander was responsible for:

- Directing and controlling incident operations.
- Maintaining personnel accountability.
- Monitoring radio transmissions.
- Managing a MAYDAY
- Managing the transition of units not involved in the MAYDAY to a separate tactical talk group.
- Assigning and activating the RIT.

Had it not been for the assignment of four command officers into tactical roles and the presence of Chief 703B as the senior advisor at the Command Post, the incident commander may become severely overtaxed.

It is impossible for a single individual to process such a large volume of information and effectively manage so many concurrent tasks without missing critical information and/or adversely impacting fire ground operations. Supplementing the Command Post with additional personnel who function as an incident management team would assist the Incident Commander and help to ensure that critical tasks are accomplished.

Recommendation: Increase staffing at the Command Post by developing incident management teams. This can be accomplished in a variety of ways, including:

- Assigning a command aide to all rostered command officers.
- All command officers must report to the Command Post ready for an operational assignment.
- Utilize on-scene resources to assist with command functions.

Risk vs. Benefit Analysis

THE INCIDENT AS RELATED TO SOP

E703 Officer conducted a size-up of the building including a circle check and the report the house as vacant. However, on the circle check E703 Officer failed to notice an exterior basement entrance. The initial fire attack strategy was to attack the fire through the interior of the house and down the basement stairs. While E703 was engaged in tactics within the policy to accomplish this strategy, it was discovered by another unit that an outside basement entrance existed. The strategy was then changed.

Command decided to have E703 protect a search by holding the fire at the interior basement door. E723 would make the attack through the outside entrance. Due to the dispatch of this original incident as a single engine response, E703 was well ahead of E723 which gave the fire a longer time to burn before an attack line was in place and the fire knocked down. E703 advanced a line into the room that was directly above the fire. This was evident as there was fire showing from the basement window directly under the room in which E703 and the other fire fighter took a holding position.

The SSSFFO adopted by the MCFRS has a section entitled: “BASEMENT FIRES IN SINGLE FAMILY, DUPLEX, AND TOWNHOUSE STRUCTURES”. This Basement Fire section has established policy for the first due Engine Company to take a line above an uncontrolled fire as a matter of standard practice when there is an outside basement entrance. The risk to those fire fighters above the fire is significant as was demonstrated in this incident. This is a danger repeatedly underestimated by fire departments. The National Institute for Occupational Safety and Health (NIOSH) is charged with investigating all fire fighter deaths. NIOSH has stated in every report involving fire fighter deaths from a floor collapse into a basement that, “Fire departments should ensure fire fighters are trained to recognize the danger of operating above a fire.”

THE DANGER OF THE POSITIONING ABOVE THE FIRE

The National Institute of Standards and Technology (NIST) has determined that catastrophic floor failure of even dimensional lumber structural floors can occur in less than 19 minutes from fire inception, (somewhat longer when protected by

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sheetrock), the newer “engineered” structural elements can fail in less than 5 minutes. Notably, the inception time of the fire is a rarely known quantity to the responders.

NIST has conducted burn tests showing that the surface temperature of a failing dimensional lumber floor may be as low as 100 degrees, and the deflection of the floor may be as little as 2 or 3 inches before failure. Interior crews may not be able to detect these warning signs. On this fire, evacuation of the first floor dining room was initiated as soon as the interior crews suspected a dangerous condition. Yet, the floor failed before they actually were able to evacuate.

In National Institute for Occupational Safety and Health (NIOSH) fatality report number F2004-05, a career Lieutenant in Pennsylvania was on a hose line protecting the first floor while waiting for an attack to be made on the basement fire from an outside basement entrance. The Lieutenant partially fell through the floor and died there. His crew tried to reach him, but the flames coming up through the floor as it decayed prevented them from helping him. The failed floor behind the crew actually trapped them at the top of the stairs. In fact, the crew “self rescued” by going down the basement stairs to reach the outside entrance. One of the recommendations from that investigation was the following:

“Fire departments should ensure fire fighters are trained to recognize the danger of operating above a fire. The danger of being trapped above a fire is greatly influenced by the construction of the burning building. Of the five basic building construction types (fire resistive, noncombustible, ordinary construction, heavy timber, and wood frame) the greatest danger to a fire fighter who must operate above the fire is posed by wood-frame construction...”⁸

RISK VERSUS BENEFIT ANALYSIS

A *risk versus benefit analysis* should be made by the responders before sending any crews above an uncontrolled fire.

⁸ National Institute for Occupational Safety and Health, [January 5, 2005] Fire Fighter Fatality Investigation Reports

<http://www.cdc.gov/niosh/fire/reports/face200405.html>

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Risk

Any firefighting operation has inherent risks. Fire fighters and commanders must be cognizant of this and try to mitigate the risks as much as possible.

At this fire, had the injured fire fighter in this incident fallen through the floor as little as 30 seconds earlier, or had the fire been knocked down 30 seconds later, the fire fighter would have fallen into the seat of an uncontrolled fire. Operating above an uncontrolled fire is a special risk and should be very used prudently as a fire ground tactic. Floor joists and other structural elements are eaten away by the fire with little or no indication to those on the floor above the fire. Positioning at the top of a stairway has inherent dangers beyond the issue of collapse. Interior basement stairways often act as chimneys funneling hot, toxic gasses to the floor above. It would be wise to minimize this exposure to fire fighters, especially when the potential benefit is small. A viable tactic in this situation could have been knocking down the fire before entry by using hose lines directed into the basement windows.

Benefit

The house in this incident was reported by the E703 to be “vacant”. The only potential gain on entry was property conservation. The NFPA has taken a position on high risk operations for little possible gain:

The National Fire Protection Association Standard 1500, *Standard on Fire Department Occupational Safety and Health (NFPA 1500)* Annex A.3.3.69.1 provides information that will assist in determining offensive vs. defensive operations. It reads,

“Defensive operations are generally performed from the exterior of structures and are based on a determination that the risk to personnel exceeds the potential benefits of offensive actions.”⁹

Simply stated, risk vs. gain is an evaluation of the potential benefit that a task will accomplish, weighed against the potential risks to fire personnel.

There was no potential of a rescue at this incident yet crews put themselves in a dangerous position to protect a primary search operation. If we reasonably suspect

⁹ National Fire Protection Association Standard 1500, *Standard on Fire Department Occupational Safety and Health NFPA 1500*

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there is a rescue to be made, the risk may be worth taking. The “*two in two out*” regulation under OSHA and MOSH has defined when we may assume a rescue situation exists to bypass the formulation of a “two out” crew. That standard may be similarly appropriate in forming a risk benefit analysis for operating above an uncontrolled basement fire. A fire department safety baseline is to not position lines above a floor where the fire is located before attacking the fire. For example, we do not send an exposure line to the second floor before initiating a fire attack on the first floor.

Case Studies

NIST has studied the issue of structural collapse in relation to deaths of fire fighters. NIST made the following statement to reinforce the danger as well as the difficulty in making an accurate assessment of the tremendous difficulty involved in making an informed decision about structural integrity of a building under fire conditions.

“Approximately 20 percent of the deaths of fire fighters in structure fires over the past 10 years have been as a result of structural collapse. Predicting a potential collapse is one of the most challenging tasks facing an incident commander at a fire scene. Usually, the lack of information on the building construction, fire size, fire location, fire burn time, building condition, fuel load and other factors makes the task nearly impossible.”

On June 26th, 2006 a volunteer deputy chief died after falling through the floor into a basement fire. The investigative report cited NFPA 1500 in relation to risk benefit evaluation:

Additionally, NFPA 1500 notes that “The concept of risk management shall be utilized on the basis of the following principles:

- Activities that present a significant risk to the safety of members 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 members, and actions shall be taken to reduce or avoid these risks.
- No risk to the safety of members shall be acceptable when there is no possibility to save lives or property.”

RISK / BENEFIT SYNOPSIS FOR THIS INCIDENT

The fact that information was received that the structure was vacant does not assure absolutely that the structure is vacant. The possibility of people still being inside should always be a consideration in determining operational priorities, in this case a very small consideration. Primary and secondary searches should still be performed when safe to do so. However, the fact that the structure is reported to be vacant should steer the incident commander away from risking fire fighters lives.

It is a much smaller risk to the fire fighters to have the first engine attack from the outside entrance. Had the attack by the initial company been made through the outside basement entrance, the fire would have been out sooner and with less risk to responders. When the fire is extinguished, most other concerns on the fire ground become greatly reduced in urgency. If there is no exterior basement entrance, a quick knockdown through a window is a tactic that should be considered before committing a crew to the dangers of an interior stairway attack in a basement. Attacking a basement fire with a knockdown through the basement window goes against traditional fire department doctrine, but should be considered as a strategy when the risk versus benefit assessment does not justify high risk operations as in this incident.

Recommendation: Revise SSSFFO to include a section to address the subject of Risk/Benefit Analyses in fire ground operations. This new Risk/ Benefit section should include a section on Search Assessment including a risk/benefit analysis of searching without the protection of a hose line as well as operating on a floor above an un-checked fire.

Recommendation: Revise the SSSFFO Basement Fire section to provide the option for the IC to direct an initial exterior knock down of the fire from a basement window for basement fires where there is no exterior basement entrance.

Recommendation: Revise the SSSFFO basement fire section in reference to structures where an exterior basement entrance exists. This section should provide the IC the option to direct the initial hose line to attack the fire directly by using the exterior entrance in certain situations, particularly when it is believed there is no perceived rescue problem and there are no interior crews operating above the fire, or if there would be a significant delay in getting the second hose line into position to make the attack from the exterior entrance.

Accountability

On Frederick Avenue the first arriving unit was caught by surprise. They responded to a transformer fire and found a working basement fire. All fire grounds are different and dynamic to begin with and when a curve is thrown into the incident, the training and experience of years of firefighting can be affected. E703 and the later responding units had to conform to an atypical incident. Even when units encounter an atypical situation, they still need to conform to safety standards and accountability is paramount for safety.

MCFRS has two primary policies for accountability.

- Montgomery County Executive Regulation 26-04 *Personnel and Unit Accountability Systems*.
- Montgomery County Fire and Rescue Policy and Procedure 24-07 AMIII *SOP for Safe Structural Firefighting Operations*.

On this incident there was widespread variance from these policies. Some of the violations of policy seemed to have become systemic. It was found in some of the interviews by this committee that the collection and use of PAS tags has ceased or at least become very low in priority. Many in the department were unfamiliar with the requirements of existing policy for entry team requirements. Several who were not even qualified to be in charge of an entry team, entered alone. Some units had under-qualified staffing riding in key positions. One person jumped onto a unit without the knowledge of the unit officer.

In addition to the two policies, the National Fire Protection Association (NFPA) enacted *Standard on Fire Department Occupational Safety and Health, NFPA 1500*. MCFRS has not adopted this Standard, but has been making strides toward meeting its requirements.

Fire and Rescue Commission Policy 26-04, *Personnel and Unit Accountability Systems*

The Policy does include all emergency incidents in its scope; however the policy seems to deal mostly with structural fire suppression incidents. For example, the incident commander is to have all of the collected PAS tags at the Command Post: in Metro incidents the several units are at alternate entry points too far from the Command Post. Hazmat and other incidents which cover a large geographic area where the PAS tags cannot be reasonably collected at the main Command Post should be assembled at the Branch, Group, or Division level.

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Recommendation: Revise Fire and Rescue Commission Policy and Procedure 26-04 dated 1/1/2009 to correct the terminology to conform to NIMS terminology. Add provisions to allow PAS tags to be collected at Group, Branch, or Division Level at the discretion of the incident commander as appropriate. Assure that all foreseeable incidents are adequately covered by an accountability system.

Montgomery County Fire and Rescue Service Policy and Procedure 24-07 SOP for Safe Structural Firefighting Operations (SSSFFO)

The SSSFFO was enacted 12/1/2005. This policy redefines an Immediately Dangerous to Life and Health (IDLH) area as

“An atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual’s ability to escape from a dangerous environment.”

and adds new accountability requirements to Executive Regulation 26-04 *Personnel and Unit Accountability Systems*. It also defines that an entry team have one member who is at least the rank of Fire fighter III. The requirement for all team members to remain in visual or voice contact with the other entry team members is added here in order to comply with MOSH and 29 CFR 1910.134 requirements. The Standard Operating Procedure for Basement Fires is found in this policy.

NFPA 1500

NFPA 1500 is a nationally recognized set of recommendations and procedures that specify minimum safety requirements for personnel involved in rescue, fire suppression, emergency medical services, hazardous materials operations, special operations and related activities. NFPA 1500, as with other NFPA standards, applies when adopted, all or in part, by a locality or entity, also known as the “authority having jurisdiction” (AHJ).

NFPA 1500 was developed as a model consensus safety and health document in the middle 1990’s as a means to improve fire fighter safety and to reduce the number of fire fighter deaths and injuries that were occurring nationwide. The standard is organized into several chapters which outline “best practices” for managing fire department operations. It covers the broad range of operations, to include training, incident management, personnel protective clothing, apparatus design, facility safety and medical and physical requirements for fire fighting personnel.

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Personnel Accountability is defined in Chapter 3 of NFPA 1500 as “a system that readily identifies both the location and function of all members operating at an incident scene.” Chapter 8 of NFPA 1500 is entitled “Emergency Operations.” Section 8.1 outlines requirements for “Incident Management” and stipulates that operations are to be carried out in a manner that recognizes hazards and prevents accidents and injuries. Section 8.4 outlines requirements for “Personnel Accountability During Emergency Operations.” The following are recommendations from NFPA 1500 Section 8.4 for implementing personnel accountability during emergency operations:

- 8.4 Personnel Accountability During Emergency Operations.
 - 8.4.1 The fire department shall establish written standard operating procedures for a personnel accountability system that is in accordance with NFPA 1561*.
 - 8.4.2 The fire department shall consider local conditions and characteristics in establishing the requirements of the personnel accountability system.
 - 8.4.3 It shall be the responsibility of all members operating at an emergency incident to actively participate in the personnel accountability system.
 - 8.4.4 The incident commander shall maintain an awareness of the location and function of all companies or crews at the scene of the incident.
 - 8.4.5 Officers assigned the responsibility for a specific tactical level management component at an incident shall directly supervise and account for the companies and/or crews operating in their specific area of responsibility.
 - 8.4.6 Company officers shall maintain an ongoing awareness of the location and condition of all company members.
 - 8.4.7 Where assigned as a company, members shall be responsible to remain under the supervision of their assigned company officer.
 - 8.4.8 Members shall be responsible for following personnel accountability system procedures.
 - 8.4.9 The personnel accountability system shall be used at all incidents.

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8.4.10 The fire department shall develop, implement, and utilize the system components required to make the personnel accountability system effective.

8.4.11 The standard operating procedures shall provide the use of additional accountability officers based on the size, complexity, or needs of the incident.

8.4.12 The incident commander and members who are assigned a supervisory responsibility for a tactical level management component that involves multiple companies or crews under their command shall have assigned a member(s) to facilitate the ongoing tracking and accountability of assigned companies and crews.

Montgomery County Fire Rescue Service Policy 26-04 Personnel and Unit Accountability Systems

On January 1, 1998, Montgomery County Executive Regulation 26-04 *Personnel and Unit Accountability System* was issued. This was an update to a previous version of procedure from February 1, 1994. Section 6 of the procedure states that “all fire and rescue officers and personnel must follow established procedures regarding personnel and unit accountability, fire ground SOPs, and fire fighter safety.”

Whereas MCFRS has not formally adopted NFPA 1500, the procedure in use is generally consistent with the recommendations of this standard.

Figure 42: Comparison of NFPA 1500 and MCFRS Procedure 26-04

NFPA 1500 SECTION	NFPA 1500 SECTION REQUIREMENT	MCFRS PROCEDURE 26-04
8.4.1	The fire department shall establish written standard operating procedures for a personnel accountability system that is in accordance with NFPA 1561.	Written procedure enacted on 2/1/1994 by Montgomery County Fire and Rescue Commission, updated 1/1/1998.
8.4.2	The fire department shall consider local conditions and characteristics in establishing the requirements of the personnel accountability system.	The procedure uses methods, terminology and resources specific to operations of MCFRS.

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NFPA 1500 SECTION	NFPA 1500 SECTION REQUIREMENT	MCFRS PROCEDURE 26-04
8.4.3	It shall be the responsibility of all members operating at an emergency incident to actively participate in the personnel accountability system.	The procedure specifies applicability to all fire and rescue personnel operating at the scene of an emergency incident.
8.4.4	The incident commander shall maintain an awareness of the location and function of all companies or crews at the scene of the incident.	The procedure is designed to enable the Incident Commander to identify, locate, and account for the function of all fire, rescue, and emergency services personnel operating on the scene of an emergency incident. Numerous tasks are identified in the procedure toward the Incident Commander accomplishing this goal.
8.4.5	Officers assigned the responsibility for a specific tactical level management component at an incident shall directly supervise and account for the companies and/or crews operating in their specific area of responsibility.	The procedure requires unit (tactical) officers to maintain constant supervision and control over all personnel assigned to their units.
8.4.6	Company officers shall maintain an ongoing awareness of the location and condition of all company members.	Officers are required to provide regular reports to the Incident Commander as to personnel location and crew integrity.
8.4.7	Where assigned as a company, members shall be responsible to remain under the supervision of their assigned company officer.	The procedure defines individual actions as to establishing initial accountability and requires unit officers to maintain this accountability; however there is no requirement for individual responders to remain under the control of their assigned company (unit) officer.
8.4.8	Members shall be responsible for	The procedure states that all fire

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NFPA 1500 SECTION	NFPA 1500 SECTION REQUIREMENT	MCFRS PROCEDURE 26-04
	following personnel accountability system procedures.	and rescue officers and personnel must follow established procedures regarding personnel and unit accountability, fire ground SOPs, and fire ground safety.
8.4.9	The personnel accountability system shall be used at all incidents.	The procedure applies to all fire and rescue personnel operating at the scene of an emergency incident.
8.4.10	The fire department shall develop, implement, and utilize the system components required to make the personnel accountability system effective.	The procedure specifies uniform personnel accountability identifiers (tags), drop off requirements, entry requirements, accountability checks and procedures for task assignment/completion and maintenance of crew integrity.
8.4.11	The standard operating procedures shall provide the use of additional accountability officers based on the size, complexity, or needs of the incident.	The procedure identifies "Sector Officer" and "Entry Control Officer" as additional command positions with responsibility for crew operation and supervision.
8.4.12	The incident commander and members who are assigned a supervisory responsibility for a tactical level management component that involves multiple companies or crews under their command shall have assigned a member(s) to facilitate the ongoing tracking and accountability of assigned companies and crews.	The procedure does not specify the use of command aides or other personnel to assist the Incident Commander or other command positions with tracking and accountability of assigned companies and crews.

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NFPA 1500 Section 8.4.7 requires “Where assigned as a company, members shall be responsible to remain under the supervision of their assigned company officer” but MCFRS Policy 26-04 does not include a requirement for individual responders to remain under the control of their assigned company (unit) officer.

RECOMMENDATION: Amend Executive Regulation 26-04 *Personnel and Unit Accountability Systems* to state that individual responders are responsible to be accountable to the company (unit) officer.

Personnel and Unit Accountability Systems Section 4. Policy.

To ensure personnel and unit safety during emergency operations, all personnel and units must be identified, located, and accounted for at all times on the scene of an emergency incident.

Personnel and Unit Accountability Systems Section 5.A. Procedures for Personnel Accountability.

- C Personnel who respond to an emergency incident on a fire/rescue unit must place their personnel accountability tag on either the secondary or primary ring. A unit identification tag must be attached to all primary collector rings.
 - 1 When personnel exit the unit on arrival at the incident, the driver will collect their personnel accountability tags and place them on the primary collector ring in the vehicle’s cab.
 - 2 Personnel Accountability Tags may be added or removed from the primary collector ring only with the approval of the Incident Commander
- H As soon as possible after establishing command, the incident commander will have the primary collector rings collected and assemble at the command post to monitor personnel and unit accountability

Personnel and Unit Accountability Systems Section 5.B. Procedures for Unit Accountability.

- B. Unit officers should maintain constant supervision and control

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over all personnel assigned to their units

- C Unit officers must ensure that personnel under their supervision operate in teams of at least two when ever entering a hazardous area

ASSIGNED RIDING POSITIONS

The policy regarding riding assignments at station 3, Rockville Volunteer Fire Department (RVFD) was clarified in a memorandum issued by the MCFRS Operations Chief on July 30, 2008 and amended August 28, 2008 see Appendix 5 – Decision Memorandum Riding Assignments at FS3. The policy was adopted based upon a series of meeting between representatives from RVFD and MCFRS Operations Division.

The policy established that during weekday hours (Monday-Friday 0700-1700) the ranking career officer has the sole authority to make riding assignments for all personnel including volunteers.

During nights and weekends (Monday – Friday 1700-0700 and 24 hrs on Saturday and Sunday) the RVFD Crew Leader or their designee will assign RVFD personnel. Final staffing assignments must be completed by 2300 hours each night and no movement should occur after that unless agreed upon by the affected individuals.

Prior to the August 28, 2008 memorandum, it had been RVFD policy that all volunteers wishing to ride must check in with the ranking volunteer or career officer for an assignment. Upon receiving that assignment, they must then inform the Office in Charge of the unit to which they have been assigned of that assignment.

On this dispatch of this call a fire fighter who was not assigned to apparatus that evening jumped into the RS703 5th position without having been assigned to that unit by the night crew officer, without the knowledge of the RS703 Officer, and failed to advise RS703 Officer the member had joined the crew.

Upon arrival RS703 5th entered the IDLH independently; still without the knowledge of the RS703 Officer, and reportedly operated the second hose line that had been pulled to Division 1 by E703 Left. RS703 5th continued to operate during the incident without direct supervision.

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It was not until after the incident and all fire fighters had exited the structure that RS703 5th informed RS703 Officer that the member had joined the crew upon leaving station 3.

RECOMMENDATION: All personnel must follow Personnel and Unit Accountability Policy #26-04 and be assigned to apparatus by either the volunteer officer or career officer. Upon receiving that assignment, said crew member must check in with the unit officer of the apparatus to which they were assigned.

PAS TAGS

As stated previously, MCFRS Executive Regulation 26-04 section 5a, dictates that all personnel who respond to an emergency incident on a fire/rescue unit must place their Personnel Accountability Tag on that unit. It is the responsibility of the unit drivers to collect the Personnel Accountability Tags and place them on the primary collector ring which is located in the vehicle cab. It is the Incident Commander's responsibility to gather the collector rings and assemble them at the incident command post in order to monitor personnel and unit accountability.

In a post-incident interview, the Incident Commander never stated the Personnel Accountability Tags were collected nor was it heard on radio transmissions that any one was assigned to do so. During interviews, some personnel did not definitively state if their PAS Tags were either (1) on the unit or, (2) could not confirm where on the unit they were placed.

RECOMMENDATION: Enforce the existing Executive Regulation # 26-04 *Personnel and Unit Accountability* section 5.a. It is recommended that the Personnel and Unit Accountability regulation be reviewed for possible updating and consider implementation of the Washington COG PASSPORT standard accountability system.

CREW INTEGRITY

During the incident personnel accountability did not comply with Executive Regulation 26-04. This was particularly significant for the first arriving units who were in the area where the floor collapse and ensuing Mayday occurred. For the

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purpose of the *Reports* discussion, the analysis of personnel accountability will be limited to the actions of E703, RS703, T703 and Incident Command. The major concerns are summarized as follows and will be expanded upon further:

- The crew of E703 was assigned to specific tasks upon arrival by the unit officer; however, once fire attack commenced, personnel did not remain together as a team.
- A member from Station 3 had boarded RS703 upon dispatch without notifying the RS703 Officer. RS703 Officer was unaware and, did not have initial accountability of the member.
- RS703 Driver entered the building (IDLH) alone and operated independently.
- The crew of T703 immediately split up on arrival and performed tasks without any specific assignment from the unit officer.
- T703 Officer, Driver, Left and Right entered the building (IDLH) by themselves and operated independently.
- The Drivers of E703, T703 and RS703 did not collect PAS Tags for their unit personnel.
- The Incident Commander was not in possession of PAS Tags for all personnel operating on the fire ground, in particular the personnel from E703, T703, nor RS703.
- When the “Mayday” occurred, there was a delay in verifying the identity and location of the missing fire fighter. A Personnel Accountability Report (PAR) was not completed until approximately 10 minutes after the Mayday occurred.

Engine 703

When E703 arrived, E703 Officer quickly realized that the “transformer” incident was actually a working structure fire at a different location and appropriately requested ECC upgrade the incident.

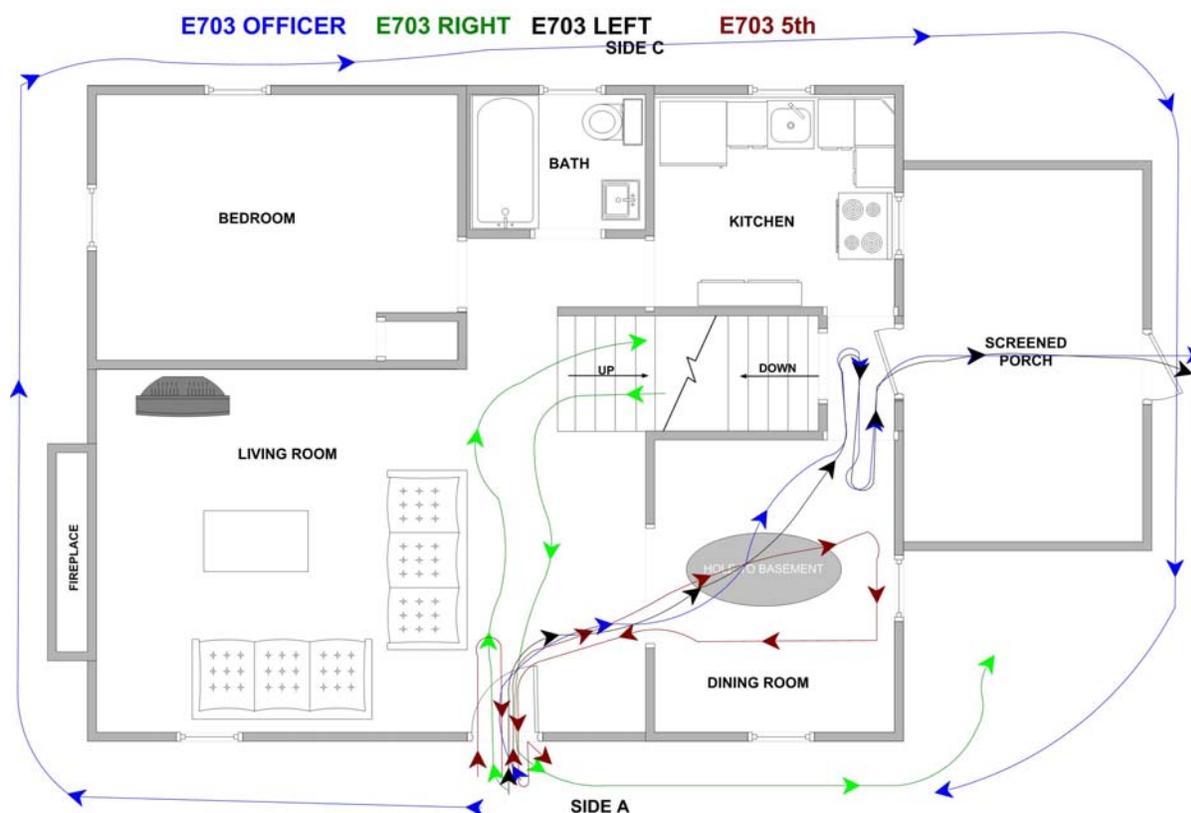
E703 Officer delegated tasks to the crew to ensure a water supply was established and a hose line was advanced for initial fire attack. E703 Officer completed a circle check of the building and returned to SIDE ALPHA to begin fire attack operations. E703 Officer radioed to inform ECC that fire attack was proceeding in a reported “vacant” house and assigned T703 as the two-out. E703 Officer and E703 Left, operating as a team of two, advanced a pre-connected 1 ¾ inch hose line into the SIDE ALPHA entrance and proceeded across the first floor dining room, Quadrant Delta, with members of RS703 immediately ahead of them. RS703 Officer found the top of the basement stairs and directed E703 Officer to that location. The crew of E703 held that position. E703 Officer and E703 Left remained in contact at all times.

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After establishing a water supply and charging the hose lines, E703 Driver remained outside to conduct support activities.

After assisting with the water supply operation, E703 Right entered the building (IDLH) at SIDE ALPHA alone and without assignment from E703 Officer. E703 Right met up with T703 Left, who had also entered the building (IDLH) alone and without assignment, and they proceeded to the 2nd floor as a team and performed a search operation. During the search operation, they spilt up, but remained in voice contact with each other. Upon completion of the search operation, they exited the 2nd floor as a team. E703 Officer was not aware of the location of E703 Right during this period of time.

Figure 43: Combined Path of E703 Crew on First Floor



After assisting with the water supply operation, E703 5th entered the building (IDLH) at SIDE ALPHA alone and without assignment from E703 Officer. E703 5th reported that “someone” gave direction to advance a second hose line, which had been pulled to the SIDE ALPHA entrance, into the building. E703 5th attempted to complete the assignment and was able to advance the hose line a few feet into the building. The hose line then appeared to catch on something, so E703 5th retreated

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to the SIDE ALPHA entrance. After freeing up the hose line so it could advanced, E703 5th repositioned to the initial hose line, assisting its advancement toward the interior basement stairs position occupied by E703 Officer and E703 Left. E703 5th recalls advancing the hose line across the dining room floor and stopping at the dining room, Quadrant Delta, wall. E703 Officer was not aware of the location of E703 Right during this period of time.

E703 6th (Observer) assigned to E703 remained outside and was not involved in the operation.

Truck 703

T703 was the third arriving unit to arrive on the scene.

Before detailing the actions of the crew from T703, three additional facts should be considered:

- T703 Officer was a detail officer who was not totally familiar with Station 3 personnel, in particular the volunteer members who were assigned to the apparatus that shift.
- Station 3 was using a reserve aerial truck at the time of the incident. The normal AT703 was out of the station for maintenance.
- The replacement aerial truck was equipped with six riding positions and four Self Contained Breathing Apparatus (SCBA), however six personnel were assigned to the unit that shift. This required the T703 5th to dismount T703 and locate a SCBA from another unit, which temporarily removed that member from the crew. Further, the SCBA unit for the officer position was situated such that it did not allow donning while en route. T703 Officer was required to wait until the unit arrived and was stationary so that the SCBA could be donned. While T703 Officer was donning the SCBA the T703 crew advanced ahead of the officer.

When T703 arrived on the scene, the crew from E703 was preparing to advance the hose line into the SIDE ALPHA entrance. T703 had not acknowledged the previous radio transmission from E703 Officer requesting that T703 handle the “2 out” assignment. Conversely, E703’s Officer did not confirm the establishment of “2 out” and entered the building (IDLH) without that resource in position.

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The crew from T703 dismounted and began to perform fire ground tasks in support of suppression and rescue operations; however, these were not assigned by T703 Officer.

T703 Driver positioned ladders with the assistance of T703 5th. Upon completion, T703 Driver entered the building (IDLH) alone and without assignment. T703 Driver was attempting to meet up with T703 Officer. While inside, T703 Driver received a radio order to place lights on SIDE CHARLIE and exited the building from the SIDE ALPHA entrance to complete that assignment. T703 Officer was not aware of the inside location of the T703 Driver during this period of time.

After donning a SCBA, entered the structure via the SIDE ALPHA entrance. T703 Officer advanced through the living room area, Quadrant Delta, along the hose line and positioned near E703's crew. T703 Officer did make contact with E703 Officer. T703 Officer and E703 Officer had verbal communication that the floor in the living room, Quadrant Delta, was beginning to sag and that it was time to exit the building.

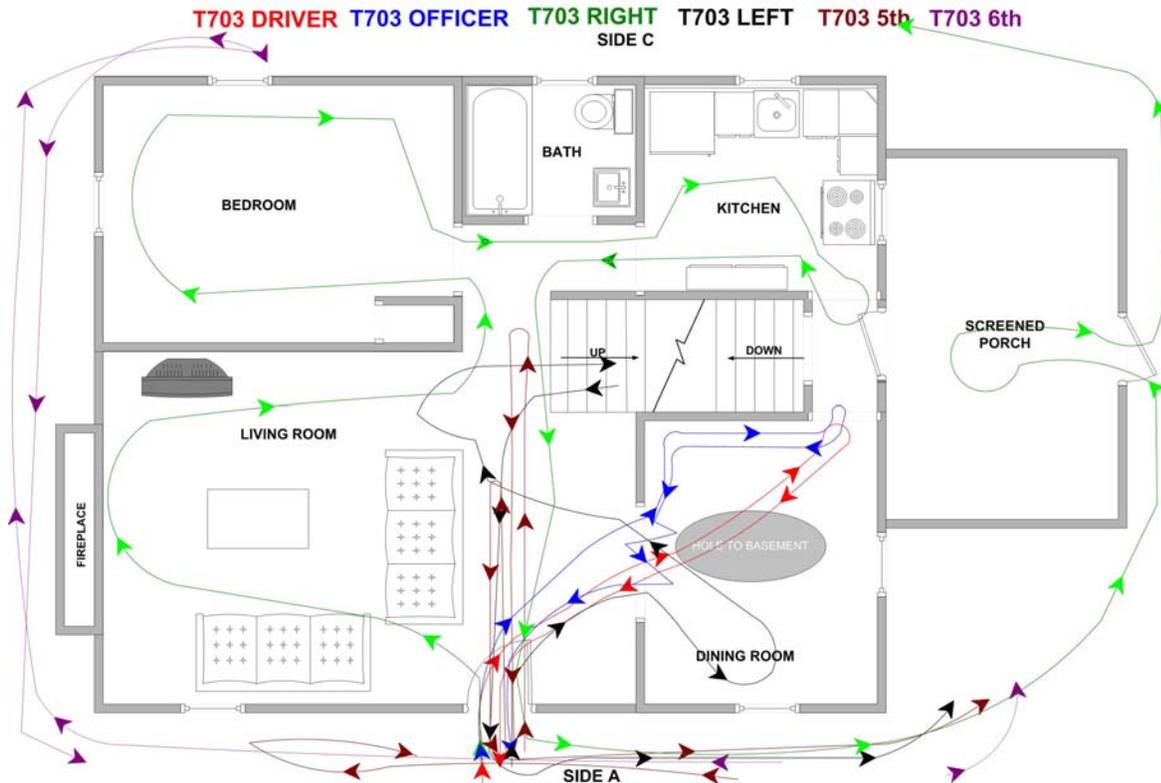
While exiting the dining room, T703 Officer felt the floor collapse and subsequently transmitted a Mayday on talk group 7-Charlie. The transmission was acknowledged by Command, as a unit calling, but not comprehended as a Mayday. A second Mayday was transmitted by T703 Officer, after depressing the emergency button on the portable radio, with information that personnel had fallen through the floor into the basement.

T703 Officer exited the building from the SIDE ALPHA entrance and proceeded to the front yard near the fence and accounted for all crew members that returned to this location. T703 Officer relayed the crew's accountability to Command.

T703 Right entered the building (IDLH) alone and without assignment, performed a left hand search of the first floor, then exited the building via the SIDE ALPHA entrance to assist E723 with forcible entry at SIDE CHARLIE basement entrance. T703 Officer was not aware of the location of the T703 Right during this period of time.

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Figure 44: Combined Path of T703 Crew on First Floor



T703 Left entered the building (IDLH) alone and without assignment and then met up with the E703 Right in the downstairs hallway. They proceeded to the 2nd floor as a team where they performed a search operation. During the search operation, they spilt up, but remained in voice contact with each other. Upon completion of the search operation, they exited the second floor as a team. T703 Officer was not aware of the location of T703 Left during this period of time.

T703 5th assisted T703 Driver with exterior ladder placement and then entered the building (IDLH) at the SIDE ALPHA entrance alone and without assignment. T703 5th proceeded through the 1st floor hallway along the second hose line that had been advanced into the building from the SIDE ALPHA entrance. T703 5th remained at that location for approximately five minutes and then exited the building from the SIDE ALPHA entrance. T703 Officer was not aware of the location of the T703 5th during this period of time.

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T703 6th assisted T703 Driver with exterior ladder placement and then was ordered by T703 Driver to position lights to SIDE CHARLIE to assist operations. T703 Officer was not aware of the location and movement of the T703 6th during this period of time.

Rescue Squad 703

When RS703 was dispatched, a RVFD member boarded RS703 and took the 5th position. The member did not communicate this to RS703 Officer. RS703 Officer did not know about the 5th until a unit accountability check was performed after the Mayday.

RS703 was the second arriving unit to arrive on the scene.

Upon RS703's arrival on the scene, the crew from E703 was preparing to advance the hose line into the SIDE ALPHA entrance.

The crew from RS703 dismounted and began to perform standard fire ground tasks in support of the suppression and rescue operations. RS703 Officer ordered RS703 Left and RS703 Right to remain at SIDE ALPHA of the building while completing a circle check of the building, removing first floor exterior windows on sides Alpha, Bravo, and Charlie, then returning to SIDE ALPHA.

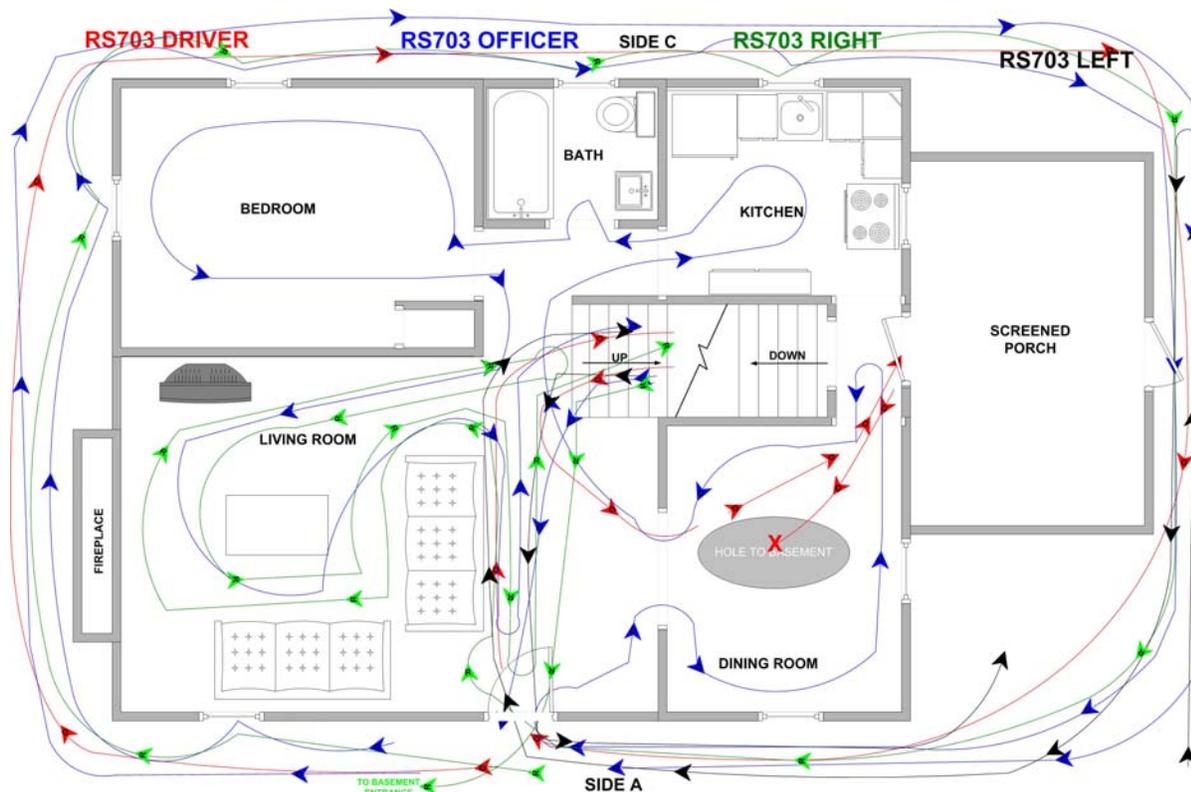
RS703 Officer, RS703 Left and RS703 Right entered the building (IDLH) at SIDE ALPHA, immediately behind E703's crew. Due to delays in hose line advancement RS703 Officer passed the engine crew and conducted a right hand search and located the basement stairs. RS703 Officer directed E703 Officer and E703 5th to the stairs position.

RS703 Officer remained at this location for a short period of time and communicated verbally with the RS703 Driver, who had arrived there after completing an independent search of the 2nd floor. RS703 Officer then proceeded to the 2nd floor for a search with RS703 Left and RS703 Right.

After completing the search on the 2nd floor RS703 Officer instructs RS703 Left and RS703 Right to exit the structure and to proceed to the basement. RS703 Right follows RS703 Officer but RS703 Left does not as a door closed blocking the exit path. RS703 Officer is un-aware that RS703 Left is not following RS703 Right and RS703 Officer to the basement.

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Figure 45: Combined Path of RS703 Crew on First Floor

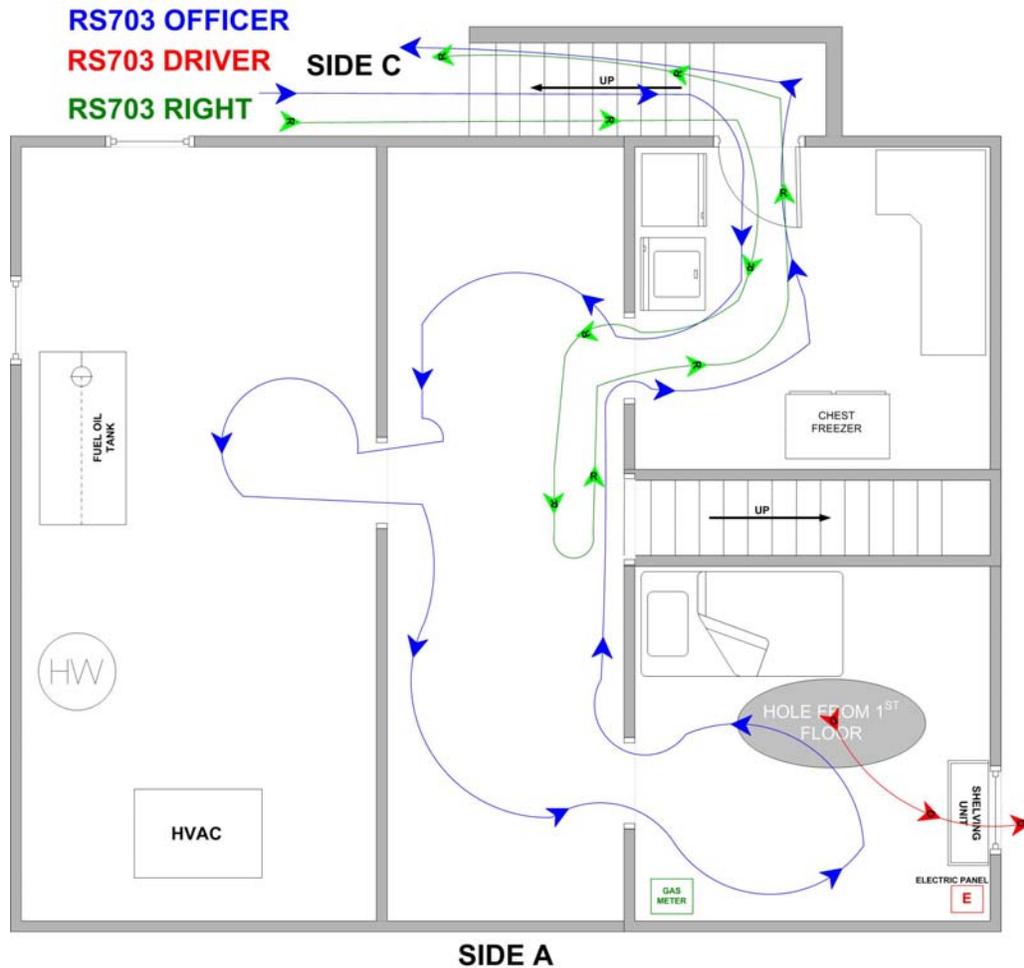


Upon arriving at SIDE CHARLIE, RS703 Officer and RS703 Right enter the basement behind E723's crew and assist with searching the basement.

RS703 Driver did not collect the PAS Tags and place them on the primary collector ring in the cab of RS703. RS703 Driver entered the building (IDLH) at SIDE ALPHA alone after doing a circle check looking for the building utilities. RS703 Driver had not been given a specific assignment by RS703 Officer, however they had an "normal" working doctrine of performing opposite searches.

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Figure 46: Combined Path of RS703 Crew in Basement



RS703 Driver entered the 1st floor and proceeded to the 2nd floor to conduct a search. After completing the search RS703 Driver returned to the 1st floor and met up with RS703 Left, RS703 Right, and RS703 Officer. After this RS703 Driver remained with the crew of E703 at the basement stairs entrance.

RS703 5th is believed to have entered the building (IDLH) alone and without assignment and was seen operating an attack line. The member then left the building after an unspecified period of time. This member was unavailable post incident for interviews.

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RECOMMENDATION: Enhance crew/unit accountability crew integrity and operational discipline by

- Crew/team leaders are responsible to ensure accountability of personnel.
- It is mandated per OSHA/MOSH 1910.134 that crews/teams must be minimum of 2 qualified personnel and they must maintain visual or verbal contact. (radio contact does not meet the standard)
- Enforcing SSSFFO, Section I Definitions x. Team, requiring that each crew/team must be lead by a minimum of a Fire fighter/Rescuer III
- No one enters IDLH structures as an individual.
- All crews/teams must have at least 1 portable radio.

COMMAND OFFICERS IN IDLH

Command level officers are typically single person units and are assigned by Command as part of ICS to supervise divisions, sectors, groups or branches. Being single person units, command officers enter IDLH environments as an individual.

Upon arrival, C703F was assigned by Command as the Division 1 supervisor. C703F was a single person unit entered Division 1 as an individual. While in the IDLH, C703F was in contact with multiple personnel and exited and re-entered the structure at least once to observe the fire conditions. C703F did not have an aid and was assigned to supervise Division 1 units which included T703 and E703.

BC703 was also a single person unit. Upon arrival, BC703 was assigned by Command to be Basement Division. BC703 entered the Basement Division as an individual.

Recommendation: Command officers and any person entering the IDLH must operate as a team, as outlined in OSHA 1910.134 and Executive Regulation 26-04 *Personnel and Unit Accountability*. Single persons must be married with a partner or crew before entering the IDLH. Assigning command aids to all command officers will provide a solution.

Mayday

MAYDAY, as defined by SSSFFO, is

“an emergency distress signal indicating that one or more fire/rescue personnel need emergency assistance to escape an IDLH atmosphere, or other life threatening situation.”

Mayday situations that have occurred in recent years include fire fighters becoming disoriented, trapped or entangled due to collapse of structural members, escape routes are blocked by fire or collapse, or fire fighter air supply has become low or completely exhausted. Regardless, a Mayday situation requires a strategic change in the Incident Action Plan as the Incident Commander has a known fire fighter rescue situation.

A Mayday situation requires a number of rapid disciplined operations from those involved in the Mayday itself, the Incident Commander, the rescuers assigned to locate and remove the endangered personnel and the remaining personnel who must continue to be focused on the original fire ground mission. Individual fire fighters must not delay reporting their need for assistance and officers must not delay reporting the fact that they cannot account for members of their crew.

FREDERICK AVENUE MAYDAY OPERATIONS

During the initial scene size up, E703 Officer reported a working basement fire and requested a full structural dispatch assignment for a house fire from ECC. During the circle check, E703 Officer did not observe that the house had a basement entrance on SIDE CHARLIE.

Following the SSSFFO, E703 Officer established command and directed the advancement of a 200' 1 ¾" pre-connected hose line into the 1st floor SIDE ALPHA entrance and across the dining room, Quadrant DELTA, floor to the top of the basement stairs. E703 Officer directed that T703 assume two-out, but this order was not acknowledged by the T703 Officer. The initial strategy was to attack the basement fire by advancing the hose line down the interior basement stairs.

The crews from RS703 and T703 arrived next and began operations including ventilation, search and rescue, and positioning of scene lighting. Chief 703C arrived

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on the scene and established "Frederick Avenue Command." Chief 703 and Chief 703F arrived shortly thereafter. Chief 703 was assigned Charlie Division and Chief 703F was assigned Division 1.

Command attempted to confirm the presence of an exterior basement entrance. Several unsuccessful radio transmissions took place. RS703 Officer radioed to Command that the attack was being readied from the top of the interior basement stairs.

Almost immediately following this transmission, Chief 703 advised Command that the building had an exterior basement entrance. Command ordered E703's crew to "hold up," and directed E723 to advance a hose line to SIDE CHARLIE to attack the basement fire. E703 maintained a position at the top of the interior basement stairwell to hold the fire in check.

RS703 Officer, RS703 Left, RS703 Right and T703 Right re-located to SIDE CHARLIE of the building to assist E723 with the basement fire attack. RS703 Driver remained on the 1st floor with the crew from E703. RS703 Driver was in a standing position, located slightly more toward the top of the basement stairs than E703's crew, who were in a kneeling position. At approximately 0150 hours, T703 Officer and E703 Officers had verbal communication that the floor in the dining room, Quadrant Delta, was losing its integrity and it was time to exit the building. As this was occurring, the RS703 Driver began to exit the building, moving toward the SIDE ALPHA entrance and past the location of E703 Officer. E703 Officer does not recall this movement.

At approximately 0152 hours, just as RS703 Driver was crossing the dining room floor toward the SIDE ALPHA entrance, the floor of the dining room collapsed. RS703 Driver fell through the floor, becoming momentarily suspended at the armpit level by the flooring that was left intact. RS703 Driver dropped into the room below, which was the room where the main body of fire had been located. The fire had been extinguished just prior to the collapse; however, the room was still very hot with steam and minor spots of residual fire.

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Figure 47: Dining Room Floor - from Front Entrance Way(SIDE ALPHA)



At 0152 hours, a Mayday transmission was made on 7-Charlie. The transmission was acknowledged by Command but not comprehended as a Mayday. At 0153 hours, a second Mayday was transmitted by T703 Officer after depressing the emergency button, with information that personnel had fallen through the floor into the basement.

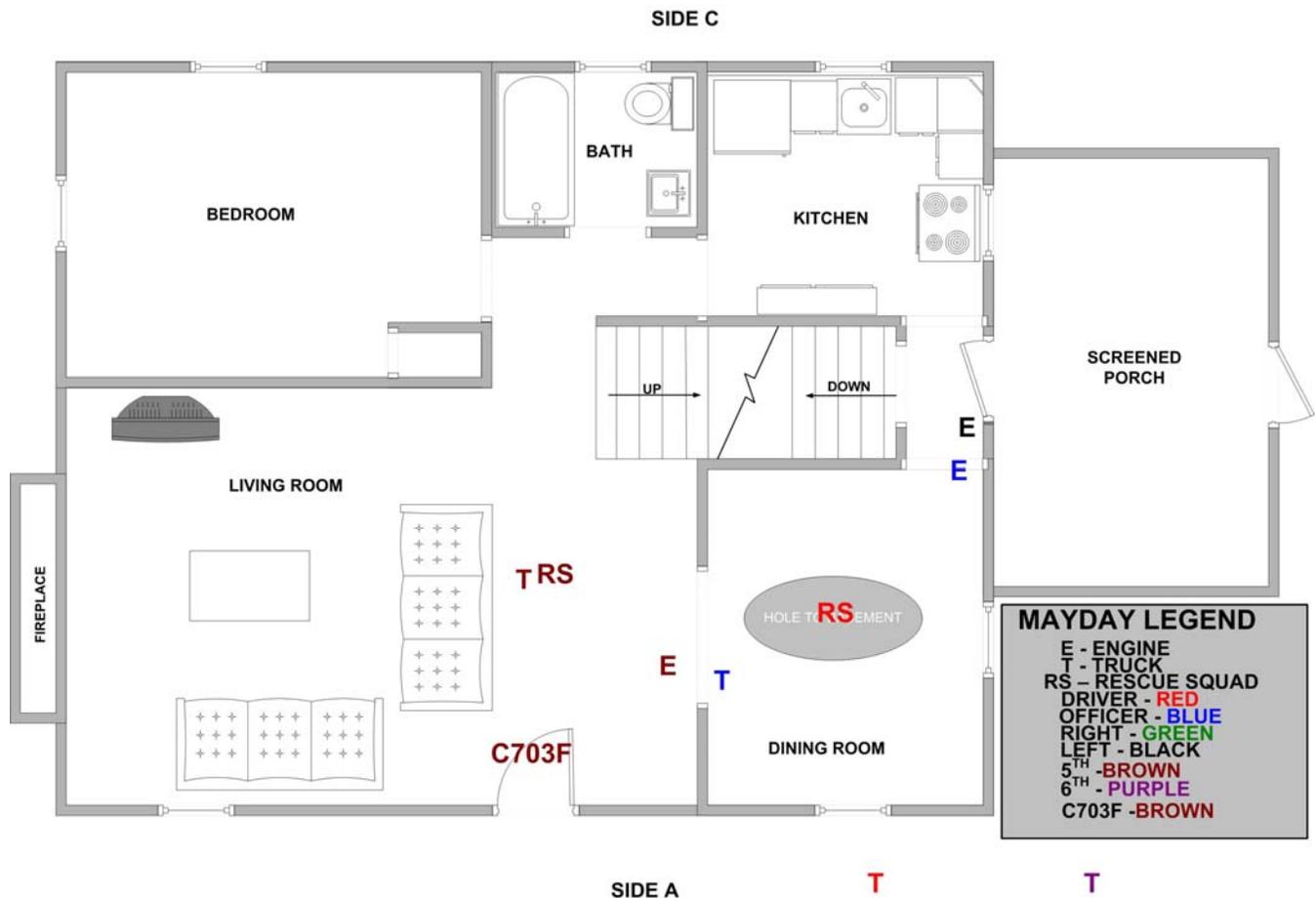
RS703 Driver was able to locate a basement window on SIDE DELTA and, after several attempts, was able to partially climb out. T703 6th was outside in the vicinity of this window, saw RS703 Driver partially out of the window, and assisted with extricating the member fully.

Upon hearing the Mayday, RS703 Officer, operating in the basement, moved into the fire room as a faint sound resembling a PASS device was heard in that direction. A search of the was negative. RS703 Officer attempted unsuccessfully to communicate the findings of the search due to excessive radio traffic. RS703 Officer

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and RS703 Right ultimately exited from SIDE CHARLIE and returned to SIDE ALPHA of the building where it was learned the Mayday was for RS703 Driver.

Figure 48: Location of Personnel on First Floor at Time of Mayday



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Figure 49: Location of Personnel in Basement at Time of Mayday

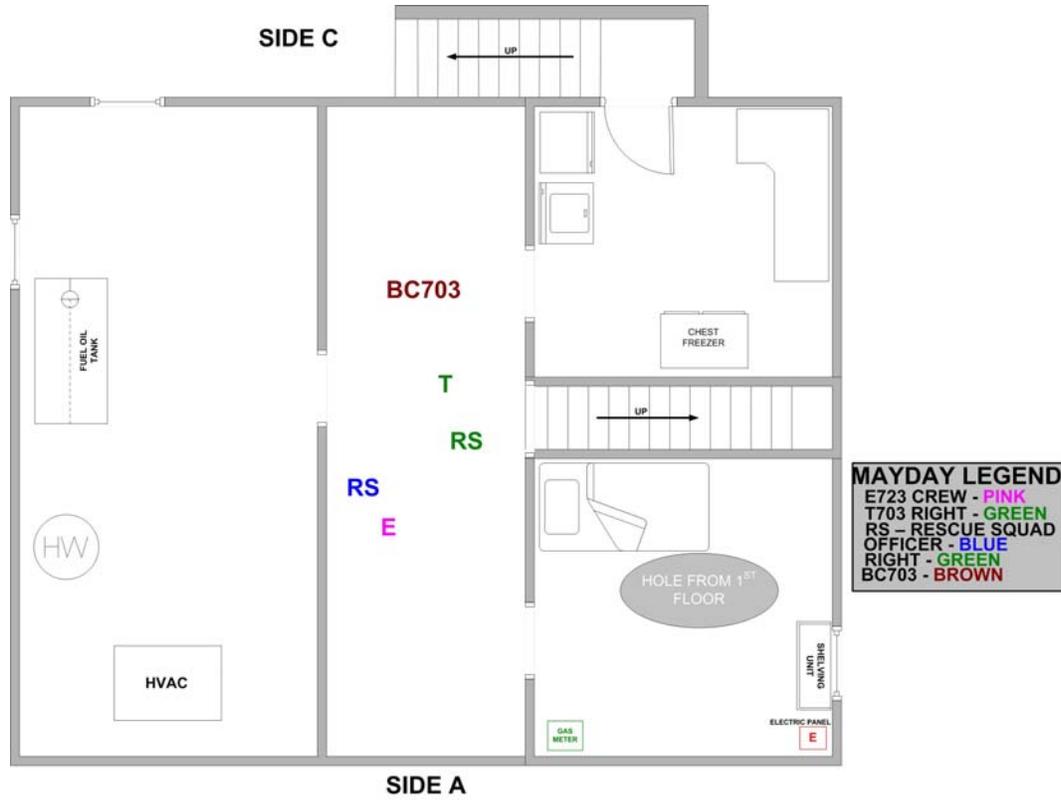
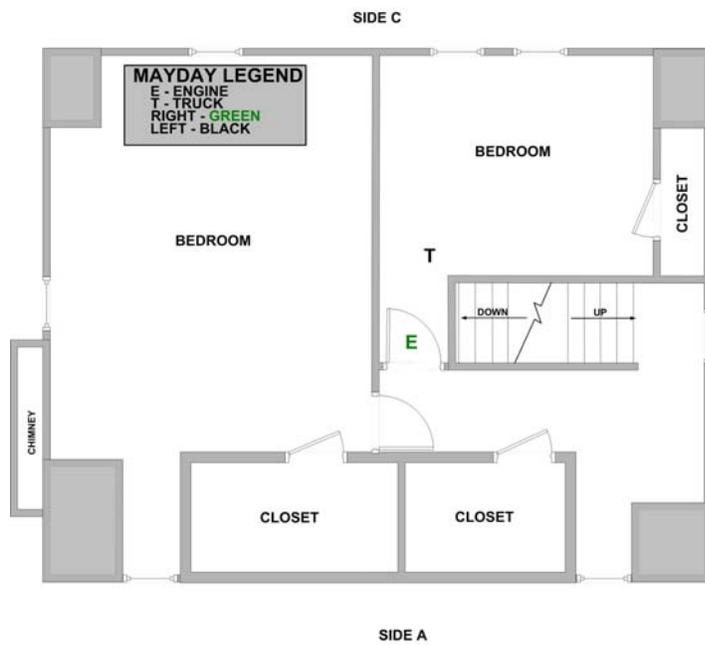


Figure 50: Location of Personnel on Second Floor at Time of Mayday



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Mayday Timeline (as transcribed from 7-Charlie)

01:49:32 SIDE CHARLIE

Chief 703 to Command I am on SIDE CHARLIE, Company 23 units are preparing to enter the basement, we've confirmed with units on the first floor that they are holding at the stairs.

01:49:45 Command

Command's direct.

NOTE: From 01:45:48 to 01:52:31 there are 26 radio transmissions on talk group 7-Charlie regarding incoming units and assignments on the fire ground.

01:52:41 T703 Officer

Mayday, Mayday, Mayday.

01:52:47 Command

Command to the last (unknown) message, repeat?

01:52:52 Division 1

Division 1 to Command. The floor has given way on the first floor; I'm backing the guys out of Division 1 at this point.

01:53:01 Command

Command's direct.

01:53:09 Rescue Squad 742

Rescue Squad 742's on the scene.

01:53:18 Tower 725

Tower 725's on the scene.

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01:53:22 T703 Officer

Mayday, Mayday, Mayday this is Truck Company 703.

01:53:32 Command

Command to Truck 703, go ahead with your Mayday.

01:53:37 T703 Officer

Through the floor, at this time all I can tell you is we have several unaccounted for.

01:53:50 Division 1

Division 1, Division 1, all units in Division 1, I need to you to back out now!

01:53:57 Command

Units on the fire ground, all units on the fire ground, switch to 7-Delta.

01:54:06 Command

Chief 703 Bravo will be on Delta.

01:54:15 E703

Engine 703 to Command.

01:54:20 Command

Go ahead 703.

01:54:24 Basement Division

Battalion 703 to Command, your Mayday is occurring in the Delta Quadrant of the first floor. Have one fire fighter that has come out of window, being taken for medical treatment. Have crews opening, entering Division 1 SIDE DELTA for the Mayday.

01:54:43 Command

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Command to Montgomery, let me have two medic units on the scene. All EMS units to SIDE DELTA, SIDE DELTA at this time.

01:54:51 ECC

Montgomery's direct.

01:54:53 Medic 723:

Medic 723 on the RID going to SIDE DELTA.

01:54:58 Rescue Squad 742:

Squad 742 to Command, I'm on the scene, I'll be approaching the house for the RIG.

01:55:05 Command

Command to the Mayday unit, do you copy me, Command to the Mayday unit.

01:55:14 T703 Officer:

This is Truck Company number 703.

01:55:23 Command

Can you give me your LUNAR?

NOTE: From this point in the incident, there was no further radio traffic with T703. From 01:55:28 until 01:59:11 (3 minutes, 43 seconds) there were 22 radio transmissions by other operational units. T703 was declared "PAR" at this time by way of a verbal transmission on 7-Charlie from Unit 2 to Command after face-to-face dialogue with T703 Officer.

From 01:59:11 to 02:03:36, 25 additional radio transmissions occurred. At 02:03:36 Command advises Montgomery that a PAR is complete.

02:03:36 Command

Standby Montgomery um, as far I am being told at this time I just wanted to give you a heads up that we have a PAR, on all of the initial units, uh, as far as

the injured fire fighter give me a couple of minutes and I'll get you the information.

MAYDAY PROTOCOL

The SSSFFO prescribes actions to be taken during a Mayday operation. The procedure describes conditions that warrant a Mayday declaration, how to declare a Mayday, and the actions to be taken by the Incident Commander after a Mayday is declared.

The SSSFFO requires that all personnel must be able to recognize dangerous situations where they, or their crew may be in trouble. These situations include:

- When a fire fighter has become entangled, trapped or pinned;
- When personnel have fallen through a roof or floor and cannot be accounted for or have become injured;
- When personnel are caught in a flashover;
- When personnel are off a hose line or tag line in a large/open area with zero visibility;
- When a low air alert activated and personnel cannot immediately find an exit, or;
- A fire fighter believes the safety of a crew or a crew member may be at risk.

Upon arrival, E703 Officer confirmed a working basement fire. During E703 Officer's circle check, the SIDE CHARLIE basement entrance was missed. The SSSFFO provides that, where no basement entrance is present, fire attack via descent down the interior basement stairs is allowed, but only with due regard for personnel safety.

The crew from E703 advanced the hose line to the top of the interior basement stairwell and prepared to attack the fire. However, on-going scene size up resulted in discovery of the exterior basement stairs, and this led the Incident Commander to make a decision to have E723 deploy an attack line to the SIDE CHARLIE exterior basement entrance. This resulted in a time delay on the fire attack of at least five minutes, which provided additional burn time for the fire that was impinging directly on the floor joists below the location of the E703 crew.

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Recommendation: Revise the SSSFO to permit the basement fire attack by the first due engine to begin, in certain cases, before establishing an attack line to hold the basement stairs. For example, an immediate attack could occur if the Incident Commander believes the fire can be knocked down before a search team is in place to operate on the floors above.

Policy should also allow the Incident Commander to begin a basement fire attack, without a hose line holding the basement stairs, in a building that is believed to be unoccupied where the suppression benefits would outweigh the search benefits. This will prevent units from being in place and dangerously waiting above an unchecked fire when the reasons for occupying that high risk position are dubious and attacking the fire immediately would be the most prudent action.

The SSSFFO defines procedures to be taken when recognizing a Mayday situation. These include activation of the radio emergency button (EB), transmission of “Mayday, Mayday, Mayday”, activation of the PASS device and the use of the acronym “LUNAR.” LUNAR stands for:

- Location and situation of Mayday personnel;
- Unit number and the personnel position indicator
- Name of the fire fighter
- Air supply situation
- Resources needed

During the Mayday at the Frederick Avenue incident, the initial radio transmission was garbled and unrecognizable by Incident Command. The EB was not activated. Within a minute of the initial Mayday declaration, the T703 Officer declared “Mayday, Mayday, Mayday,” and indicated that personnel had fallen through the floor. The location of the floor collapse was provided by Division 1, however details as to which personnel were missing were not able to be provided.

During the post incident interviews, several personnel had difficulty reciting the SSSFFO protocol for declaring a Mayday situation. Further the interviews indicated there is very little training in place on the Mayday protocol, formal or otherwise.

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Recommendation: A training program needs to be implemented for the Mayday protocol. This training should be delivered in as many forms and formats as possible from quick daily/shift recitations of the basic steps in declaring a Mayday, to periodic practical, hands on evolutions where personnel act as victims and rescuers. This training should be required for all ranks, from recruits to command officers and at all advancement ranks in between.

The SSSFFO prescribes that the Incident Commander take specific actions when a Mayday is declared. ECC is to be requested to sound a pre-alert tone and switch all units, except the Mayday personnel and the Rescue Intervention Group (RIG) to an alternate talk group. The intent is to isolate the location of the Mayday so as to be able to quickly direct RIG resources to that location.

Recommendation: An analysis of high risk low frequency fire ground situations, such as a Mayday situation, should occur. Where practical, required action steps should be reduced to quick action reference cards which are then placed for rapid retrieval on Command vehicles.

During the Frederick Avenue Mayday, the Incident Commander attempted to move units not involved in the Mayday from talk group 7-Charlie to talk group 7-Delta, according to policy. This action was of no value in the operation as most units continued transmitting on talk group 7-Charlie. This was compounded by the fact that the Rescue Squad 703 Driver was not in possession of a radio, thus could not have remained on talk group 7-Charlie for the accountability check.

Recommendation: A thorough evaluation of the SSSFFO Mayday Incident Command procedures should occur. This should include consideration to immediately order radio silence so that a rapid personnel accountability check can occur. Consideration should be given to eliminating the radio channel change over.

NOVA MAYDAY INCIDENT COMMAND PROTOCOL

The Incident Command procedures used in Northern Virginia provide a model that could be considered if changes to the to the SSSFFO are approved. These are highlighted below:

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Following a MAYDAY, the *NOVA Rapid Intervention Team Command and Operational Procedures Manual (NOVA RIT Manual)* requires the Incident Commander to do the following:

- Perform a Personnel Accountability Report (PAR) check.
- Have the dispatch center initiate an emergency fire ground announcement that a MAYDAY event has occurred.
- Redirect the Incident Action Plan and incident priorities to a high priority search & rescue operation.
- Have the ECC and/or command post monitor all radio channels.
- Assign the RIT to search and rescue operations in the known area or last known area where fire fighters need assistance.
- Assign relief crews to the RIT Group.
- Immediately request additional appropriate resources.
- Initiate and/or maintain fire attack positions and reinforce with extra alarm companies as needed.
- Expand the command organization.
- Withdraw and control unassigned resources from the search and rescue area.
- Maintain strong supervision in all work areas.
- Maintain an ALS capability for ready treatment of the trapped fire fighter.

Recommendation: MCFRS should incorporate the tenets of the NOVA RIT Manual into the SSSFFO or stand alone Mayday policy. Additionally MCFRS should work with MWCOG Fire Chief Committee to develop a standardized Mayday/Rapid Intervention procedure for the region to include radio silence.

LACK OF MAYDAY PROCEDURES FOR NON-STRUCTURE FIRE INCIDENTS

Although this was a structural fire incident, the SIIG noted a policy problem in that the MAYDAY policy is embedded in the Safe Structural Firefighting Policy. MAYDAYs are only covered in terms of structural firefighting. There are other non-fire involved MAYDAYs possible without any appropriate policy in place.

RECOMMENDATION: MCFRS should create a separate comprehensive MAYDAY Policy for all non structure fire incidents. For example, the MAYDAY policy does not cover the following potential incidents where a MAYDAY could be declared; a chemical terrorist incident, a HAZMAT incident, a confined space incident, etc.

Communications

The MCFRS Emergency Communications Center (ECC) is staffed with uniform fire rescue personnel. The center is staffed daily with nine call taker dispatchers and operates at a minimum staffing level of eight from the hours of 0700 to 1900 and five from the hours of 1900 to 0700. During the hours of 1900 to 0700 at least four personnel at a time are assigned to rest period and are off the dispatch floor. The personnel can be recalled to the dispatch floor as needed.

MAYDAY PRE-ALERT TONE

The SSSFFO section 4 Procedures III Mayday Bullet B outlines what an incident commander must do once a mayday is declared.

When a MAYDAY has been declared, the IC will request ECC to sound the pre-alert tone and switch all units, except the MAYDAY personnel, the IC or the IC's designee, and the RIG, to an alternate talk group. If the IC does not acknowledge a MAYDAY, any unit hearing the call must alert the IC of the MAYDAY. The IC will try to determine the exact location of the MAYDAY personnel, and order the RIG to intervene as necessary.

This states that the incident commander will request ECC to sound the "pre-alert tone." When the SIIG asked ECC to test the "pre-alert tone" the tone transmitted consisted of a seven cycle high low high low fluctuating noise lasting six seconds that is used for the dispatch of full assignments on 7-Alpha. The "alert tone" consists of a constant tone for 5 seconds.

Recommendation: Amend the SSSFFO to change the "pre-alert tone" to "alert tone." Additionally the Safe Structural Firefighting Policy must be change to allow the incident commander to use the tone as needed during a Mayday and on any event/incident.

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Bullet B of the SSSFFO goes on state that the incident commander will request ECC to switch all units not involved in the mayday to an alternate talk group. On this event the command post was staffed with Chief 703C and Chief 703B at the time of the mayday. This allowed the incident commander to move units not involved in the mayday to 7-Delta and have Chief 703B operate on 7-Delta.

Had Chief 703C been operating singularly at the command post, Command would have been expected to:

- Directing incident operations on 7-Delta.
- Maintaining personnel accountability.
- Monitoring radio transmissions on
 - 7-November (Vehicle Repeater System)
 - 7-Oscar (simplex talk around)
- Managing a MAYDAY on 7-Charlie
- Assigning and activating the RIT.

As a sole commander officer managing all of these tasks and two tactical talks groups would have been near impossible.

Recommendation: Amend the SSSFFO to allow the incident commander to determine if they will switch all units not involved in the mayday to an alternate tactical talk group. Considerations to switching talk groups should include:

- Sufficient staffing at the command post to properly monitor/operate multiple talk groups.
- Sufficient voice radio hardware to support multiple talk group operations.
- If not switching talk groups – all units on the tactical talk group, not involved in the mayday, should be instructed to maintain radio silence and to continue their tactical assignments.

CHANGING TALK GROUPS IN A MAYDAY SITUATION

When the MAYDAY was declared on Frederick Avenue it lasted for just about 1 minute before Basement Division radioed to command that the missing fire fighter had been removed from the basement window. About 40 seconds in to the MAYDAY, command radioed an instruction:

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01:53:57

Command

Units on the fire ground, all units on the fire ground, switch to 7-Delta.

Obviously a MAYDAY situation puts an Incident Commander under severe stress. Incident Command incorrectly called for all units to switch to the alternate talk group, but the intent was to comply with policy where the RIG, the Incident Command, and the MAYDAY individual would remain on the original operational talk group. The SSSFFO contains direction for the Incident Commander to make an announcement to all units when a MAYDAY occurs. The policy reads as follows:

“When a MAYDAY has been declared, the IC will request ECC to sound the pre-alert tone and switch all units, except the MAYDAY personnel, the IC or the IC s designee, and the RIG, to an alternate talk group. If the IC does not acknowledge a MAYDAY, any unit hearing the call must alert the IC of the MAYDAY. The IC will try to determine the exact location of the MAYDAY personnel, and order the RIG to intervene as necessary.”

This policy imprudently ties the hands of the incident commander by requiring that the fire ground operations be immediately switched to an alternate talk group. For example: An early arriving suppression unit or command officer has command and a MAYDAY is declared. Command has no help yet at the command post to run the fire ground operations on an alternate talk group. Moving units to an alternate talk group will leave those other units operating on the fire ground without command.

When a MAYDAY is called, a unit already inside of the building is in a position to make the rescue. By policy, the Incident Commander would switch that and most other units to an alternate talk group. The RIG may take several minutes just to get to the position where an operating unit was already operating when the MAYDAY was declared. That unit near the MAYDAY may have been able to make the rescue immediately. (E723 was within about 10 feet of the fire fighter when he fell through the floor in this incident).

Recommendation: Amend the SSSFFO to allow the Incident Commander to have the option of determining whether units are to be switched to an alternate talk group, and to allow units in the vicinity of the MAYDAY to remain on the MAYDAY operations talk group.

RADIO SILENCE

E723 was very close to the fire fighter when the fire fighter fell through the floor. E723 did not hear about the MAYDAY immediately when it happened. Had they heard it, they still would have been directed to switch talk groups even though they were probably 10 feet from the injured fire fighter. Had radio silence been declared instead of switching units off of the MAYDAY operations talk group, E723 would have picked up on the MAYDAY radioed information and could have assisted long before a RIG could have reached the position E723 was already occupying at the time of the MAYDAY.

When a MAYDAY occurs, and the Incident Commander does not have capacity to operate multiple talk groups, the Incident Commander should have the option of declaring radio silence. A viable option is to retain MAYDAY control, maintaining safe operations, and conducting a PAR when the Incident Commander is alone at the Command Post. This should also be a tool available to the Incident Commander whenever he or she sees it to serve the best advantage.

If the Incident Commander announces there is to be radio silence on the talk group instead of switching all non-SOP required units to an alternate talk group, there are several benefits to safety.

- If no second command officer is available, the uninvolved units will not be sent to a talk group without a command officer.
- Units in the area of the rescue can notify Command if they are in a position to be critically beneficial to the rescue.
- When a second command officer is in place, units may safely be switched to an alternate talk group at one time if needed.

Recommendation: Amend the SSSFFO to allow the Incident Commander to declare RADIO SILENCE instead of switching units to an alternate talk group when a MAYDAY is declared. The use of the alternate talk group should still remain the preferred option when conditions are ideal, but the Incident Commander should have the option to use radio silence.

There are crucial tasks to be performed that may be more difficult when the units are not immediately switched to another talk group. Perhaps the most crucial task is the PAR. However, if there is not a second command officer to control the alternate talk group, a PAR could not be conducted anyway. The other crucial task is command of

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the remaining units in firefighting operations. Again, lacking a second command officer to safely carry out the action plan would not be possible.

BATTALION AIDES FOR MAYDAYS

The addition of a Command Aide would be a tremendous asset to an Incident Command during a MAYDAY. A Command Aide would be able to continue to run the operational chart and provide details about the action plan to the second command officer when that officer becomes available.

Recommendation: Add Command Aide positions to each on duty career Battalion Chief. In addition to augmenting normal battalion operations, this would provide invaluable help in transferring command and the action plan to the any chief thrust into operational command when the original Incident Commander is occupied with MAYDAY operations. This would allow the command chart to be maintained and transferred without interruption. Encourage the use of volunteer Battalion Aides for volunteer duty chiefs to attain a similar benefit.

MAYDAY TASK FORCE

During this event the Incident Commander asked for the Rapid Intervention Dispatch as well as a task force. Upon the fire fighter mayday the incident commander requested two additional medic units.

Upon receiving this request ECC dispatched Medic 703 and Medic 725 at 01:56:50.

ECC personnel queried CAD for the suggestions for a mayday task force (TF) at 01:56:59. CAD recommended A703, M708, M708B, RS741, and E740. At 01:59:04 ECC then dispatched RS741 and A703 at 01:59:54, which had not been requested by the Incident Commander. The dispatch of RS741 and A703 combined with M703 and M725 comprised of the “Mayday Task Force.”

At 02:11 hours when Duty Chief 700 called ECC via cell phone to get a run down of units, the use of “Mayday Task Force” created significant confusion.

The ECC Operations Supervisor was requested to perform an ECC specific review of the event and the summary below was provided. Regarding the “Mayday Task Force.”

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- The ECC supervisor reacted to the Mayday by initiating a Mayday TF, an assignment that exists in CAD. However, dispatching this assignment was complicated by Command's request for additional medic units.
- The dispatchers/talk group operators' computer screen contains an option for additional resources called "Mayday Task Force." This Mayday Task Force was programmed into CAD in response to the January 1st, 2001 version of the Standard Operating Procedure for Safe Structural Fire Fighting Operations-Amended, Section 5, Procedures III, Mayday Signal Bullet a.

"ECC will automatically add an EMS Task Force and the closest unit equipped with a thermal imaging camera to the incident."

This requirement of the SOP was removed when the current version was issued in December 2005.

Recommendation: Remove the Mayday Task Force selection from CAD and provide communication to the personnel at ECC about its removal.

TACTICAL TALK GROUP COMMUNICATIONS

With the conversion from the VHF radio system to 800 MHz in 2003 the reliability of radio system coverage has increased exponentially while at the same time increasing the amount of non-critical radio transmissions

While operating on the VHF system a single portable radio was provided to each engine and EMS unit and usually two portables to each special service, truck/tower or rescue squad. With the 800 MHz system multiple portable radios were provided to each unit, as discussed before, while these additional portables brought on in increase in fire fighter safety they also have increased the amount of "non-critical" radio transmissions on the tactical talk group.

This issue starts at the beginning of the event were units without working mobile data computers (MDC) announce verbally they are responding and continues till the end of the event. As the reliability of the MDC's has decreased the number of

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primary units and staff/chief/support personnel having to utilize verbal unit status has increased.

Additionally one of the design features of a trunked radio system is the inability for one subscriber, users, to transmit with another subscriber is transmitting. Naturally this is a desirable safety feature but can limit the availability for a user to transmit. If a subscriber, user, presses their push to talk (PTT) button and is unable to transmit due to the talk group being busy they will receive an audible radio prohibit signal, referred to a “bonk.”

On this event there were 73 transmissions on the tactical talk group, 7-Charlie, between 01:52:00, and the conclusion of the mayday at 02:03:36.

While an average of eight transmissions per minute may not appear excessive, consider that each transmission must be heard and processed by personnel on the scene most specifically the Incident Commander. During multiple interviews personnel commented that they could not get radio air time to make a transmission or that they tried multiple times to make a transmission. This situation has become very common on the fire ground and many personnel feel the reliability of the 800 MHz system is poor because of it.

Recommendation: Issue a Fire Chief General Order that significantly reduces the amount of communication on the tactical channel. The limits should include:

During the initial phases of the event, no radio transmissions will be made on the Tactical Talk Group with the exception of:

- Water supply instructions
- Initial on scene reports
- Establishing or assumption of Command
- Communications critical to the event (e.g. SIDE CHARLIE and basement reports, any unexpected hazards, occupant information, deviations from SOP, etc. from field units or ECC.)
- Arrival of the first certified chief officer

The SIIG felt this issue was of critical life safety and presented its findings to the Operations Division Chief. At this presentation, the Operations Division Chief agreed that there needed to be a limit to tactical talk group communication and the SIIG was tasked with the development of Fire Chiefs General Order. See Appendix 6 – Fire Chief’s General Order 08-19.

Personnel Training and Certification

E703 STAFFING

With the implementation of 4-person staffing at station 3 in September 2007, Engine 703's normal staffing increased from 3 to 4 career personnel, one being an ALS provider, during weekday staffing periods. At nights and weekend due to the fluctuating staffing at station 3 the Operations Division Chief provided direction on staffing the apparatus. See Appendix 5 – Decision Memorandum Riding Assignments at FS3.

In an August 28th 2008 memo from Division Chiefs Guercio and Bowers to both Rockville LFRD and career command officers the expectation that E703 would be staffed the same nights and weekend as weekdays was transmitted. This communication stated that the career personnel's first priority would be to ensure the engine and medic unit. Additionally the memo goes on to state that Engine 703 would have 4-person staff utilizing a combination of career and volunteer personnel.

MCFRS Certification and Training Standard state that the minimum rank to be considered minimum staffing on primary fire apparatus is a Fire Fighter II. The list of rank is maintained in the Integrated Emergency Command Structure list as posted by the Fire Chief Office.

At the time of the fire Engine 703's staffing consisted of:

Position	Rank
Driver	Career FF3
Officer	Career MFF
Right	LFRD F/R Candidate
Left	LFRD F/R Candidate
5 th	LFRD FF2
6 th	LFRD Observer

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This crew composition provided only 3 personnel that meet minimum staffing level. While the staffing of 3 personnel is not a violation of Montgomery County Executive Regulation 25-08 *Apparatus Staffing Policy* it is a violation of direction provided to station 3 personnel by the Operations Division Chief.

Recommendation: Ensure that E703 is staffed at all times with a minimum of four qualified personnel, with a certification of Fire Fighter II or greater.

FIRE RESCUE CANDIDATES ENTERING IDLH

Montgomery County Executive Regulation 21-06AM, ***Certification Standards for Training, Experience, and Credentialing Requirements***, Section 4 Policy bullet d 3. A. outlines that personnel at the rank of Fire fighter/Rescue Candidate may only enter an IDLH atmosphere in supervised training sessions;

3. Personnel in the Fire fighter/Rescuer category who successfully complete the orientation training are considered Fire fighter/Rescuer candidates/recruits until they have met the training and/or certification and age requirement for Fire fighter/Rescuer I.
 - A. A Fire fighter/Rescuer candidate/recruit may ride fire suppression apparatus as an observer, and may assist qualified personnel *only if* proper supervision is provided by a Unit Officer. A Fire fighter/Rescuer candidate/recruit may do the following *only* during supervised training sessions: enter Immediate Danger to Life or Health (IDLH) environments; enter burning buildings; participate in activities requiring advanced training; or be subjected to hazardous environments

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The unit staffing on E703, T703, and RS703 included

E703	
<i>Position</i>	<i>Rank</i>
Driver	Career FF3
Officer	Career MFF
Right	LFRD F/R Candidate
Left	LFRD F/R Candidate
5 th	LFRD FF2
6 th	LFRD Observer

T703	
<i>Position</i>	<i>Rank</i>
Driver	Career MFF
Officer	Career Lieutenant
Right	LFRD FF2
Left	LFRD FF2
5 th	LFRD FF2
6 th	LFRD FF1

RS703	
<i>Position</i>	<i>Rank</i>
Driver	LFRD FF3
Officer	LFRD MFF
Right	LFRD FF3
Left	LFRD F/F2
5 th	LFRD F/R Candidate

As outlined in the sequence of operations all personnel from station 3 units went inside the IDLH of the structure except for the driver of E703.

The three F/R Candidates on the units from station 3 all entered the structure and together with other fire fighters at times and at times by themselves. These three personnel violated Executive Regulation 21-06AM when they entered the structure.

Recommendation: It is recommended that all personnel understand and follow the limitations of Executive Regulation 21-06AM, Certification Standards for Training, Experience, and Credentialing Requirements as it relates to Fire Rescue Candidates entering IDLH atmospheres during emergency response.

Recommendation: Amend the Apparatus Staffing Policy to limit the number of candidates and observers allowed to ride apparatus.

HELMET COLORS

Helmet colors for MCFRS personnel are outlined in FCGO 05-10.

Personnel are permitted to wear the following helmets:

IECS Rank	Color	NFPA Standard
Medical Attendant	Blue	1971 or 1999
F/F Candidate (non-2-out qualified)	Red	1971
Fire Fighter	Yellow	1971
Lieutenant and Above	White	1971

The FCGO specifies that red helmets are to be used for F/F Candidate while yellow is to be used for Fire Fighter. Additionally the red helmet is to specify that the F/F Candidate is not two-out qualified.

This FCGO does not account for the Recruit rank as outlined in Executive Regulation 21-06AM, **Certification Standards for Training, Experience, and Credentialing Requirements**. Additionally during the interview process the SIIG determined the understood limitation of a red helmet is “layout and stay out.” This is not the current practice at all LFRD’s as the red helmet is utilized for fire fighter personnel below the rank of Fire Fighter II. The develops a direct conflict for Fire Fighter I’s with Essentials of Fire Fighting as they are permitted to enter an IDLH but may not be counted as minimum staffing.

Recommendation: Amend FCGO 05-10 to specify the abilities of all IECS certified personnel and their abilities operation in an IDLH

Equipment

MDC

The current state of the MCFRS fleet has most primary engines, trucks, rescue squads, EMS units and battalion vehicles equipped with MDC's. However most of the reserve fleet, command vehicles and support units are not equipped. Operational MDC's decrease the amount of voice radio traffic on tactical talk groups, allow units to have the address, unit response order and receive critical information. On the morning of the incident, T703 as well as many other units assigned to this incident were either not equipped with or had functional MDC's. During the time the "Mayday" was going on many units on additional assignments were using verbal communications to go on-scene and other transmissions on the tactical talk-group causing more confusion and blocking the initial attempt by T703's Officer to declare a "Mayday" when the RS703's driver fell through the floor.

Recommendation: It is recommended that all MCFRS vehicles be equipped with a MDC and reserve units must either have a MDC or have a docking mount installed to allow movement of the MDC from the primary to the reserve unit.

CAD SELF DISPATCH FUNCTION

The current CAD System does not allow Command and specialty units not dispatched on an event to be added without transmitting via a radio talk group. This verbal communications was done on the tactical talk-group prior to the issuance of Fire Chiefs General Order (FCGO) 08-19. The verbal unit responses take up air time needed by units operating at an incident scene and in the case of the Frederick Ave, were being done on 7-Charlie while the "Mayday" was going on.

Recommendation: It is recommended that a new functionality be added to CAD to allow units not dispatched on an event to add themselves to an active event.

HEADSETS

All engines, trucks and rescue squads are purchased with radio headset communications; however a vast majority of the reserve fleet is not equipped with headsets. Radio headsets allow for clear communications between responding units, command and ECC during incident response. Headsets also allow the unit officer to provide direction to personnel en-route and assist in personnel accountability on the unit. On the morning of the incident, T703 did not have radio headsets. T703 Officer stated that it was hard to hear the radio transmissions. Radio headsets would have allowed T703's Officer to issue orders to personnel, facilitated the accountability of personnel on the unit, and assisting in hearing pertinent information from Command while responding.

Recommendation: It is recommended that all MCFRS engines, trucks and rescue squads will be equipped with radio/intercom headsets for each riding position.

SUFFICIENT SCBA PER RIDING POSITION

On the night of the incident the normally assigned apparatus, AT703, was out of service and a truck from the reserve fleet was running as T703. The SCBA configuration for AT703 is five which coincide with the number of riding positions. The reserve truck has six riding positions.

The four assigned SCBA were transferred from the tower to the reserve truck. When T703 responded on the incident they had six personnel on-board and not enough SCBA for the crew. SCBA units were taken from another units for all six of T703's members to be able to enter the structure..

Recommendation: It is recommended each unit will have the required amount of SCBA on it at all times. If a unit goes down for maintenance then a spare unit will be put in place of the unit that is OOS. If insufficient spares are available in the station then arrangements will be made with the SCBA Shop for a loaner unit. This recommendation complies with NFPA 1901 5.8.3 requiring each assigned seating position to have an SCBA.

FLOW TESTING SWAP OF SCBA

The MCFRS SCBA Shop has developed a matrix for annual SCBA flow testing based on the numerical ID assigned and stamped on the unit. The last number in the ID designates the month in which the unit goes for testing. On the October 1, 2008, all SCBA's ending in zero (0) are due for testing and FS703 had five SCBA's due to the SCBA Shop for annual flow testing. Three units were delivered to the shop on 10/1/08 for testing and the two reserve units were placed in service to cover two of the three units sent out. This left FS703 negative one SCBA. Each MCFRS station has two spare units assigned to cover flow testing and units out for maintenance.

Recommendation: It is recommend when sending SCBA out for its annual flow testing, if more units need to go then spare SCBA's are available then they must be spaced out over the required month to prevent a shortage or arrangements should be made to acquire a loaner unit from the SCBA Shop.

PORTABLE RADIO PER RIDING POSITION

MCFRS units currently have one portable radio assigned per minimum staffing for that unit. Engines that have 4-person staffing will have four portable radios and engines, trucks, rescue squads with three person staffing will have three portables. EMS units are equipped with two. Several of the LFRD's have purchased portable radios to supplement the inventory of units in their stations.

E703		T703		RS703	
Position	Radio	Position	Radio	Position	Radio
Driver	Yes	Driver	Yes	Driver	Yes *
Officer	Yes	Officer	Yes	Officer	Yes
Right	Yes	Right	Yes	Right	Yes
Left	Yes	Left	No	Left	No
5 th	No	5 th	No	5 th	No
6 th	No	6 th	No		

Note: RS703 Driver position has a radio assigned but the radio was not included in RS703's Driver PPE on this event.

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On the morning of the incident E703 was staffed with five personnel and four portables; T703 had six personnel and three portables; RS703 had five personnel and three portables. At several times during the incident there were personnel/teams from these units operating in an IDLH atmosphere without radio communications. These personnel/teams would not be able to call a “Mayday” or know if a “Mayday” or emergency was taking place. NFPA 1561 Standard on Emergency Services Incident Management only requires at least one portable radio per crew or company. Personnel safety is our top priority and a portable assigned to each riding position will allow for any crew member to call a mayday in the event of an emergency.

Recommendation: It is recommended that all primary MCFRS units be equipped with one portable radio per SCBA equipped riding position.

PORTABLE RADIO MAINTENANCE

On the morning of the incident Station 3 had 16 personnel assigned between E703, RS703 and T703 with only 10 portable radios total. Driver of RS703 had a portable radio to his assigned position and did not have it with him at the time of the event. It was later determined during the Safety Sections investigation that the battery was dead on RS703 Driver portable.

Recommendation: It is recommended that all portable radios be checked when assuming a riding position and the personnel must have the radio when on incidents.

USE OF THERMAL IMAGING CAMERAS'

T703 and RS703 are equipped with Thermal Imaging Cameras (TIC's) however; neither of those units deployed their TIC's. TIC's translate infrared energy into images visible to the human eye. TIC's are valuable tools that allow fire and rescue personnel to quickly locate trapped victims, the fire, exits and hazards that may exist in limited visibility environments.

Recommendation: It is recommended that all crews equipped with Thermal Imaging Cameras bring and use them in any limited visibility environments. Additionally equip all primary units, engines/aerials/rescue squads, are equipped with Thermal Imaging Cameras.

HAND LIGHTS

Upon arrival several personnel performed a circle check of the structure including RS703 Officer and E703 Officer however; they all stated that SIDE CHARLIE of the structure was dark and that they did not observe an exterior entrance to the basement of the structure.

Currently the SSSFFO does not include a hand light as part of the required equipment for crew members. Having hand lights would have enhanced the personnel's ability to locate the exterior stairs during the circle check.

Recommendation: Amend the SSSFFO to require that all personnel carry a hand light as part of their PPE. Ensure all riding positions are equipped with rechargeable hand lights.

Injured Fire fighter PPE and SCBA

This section addresses the injured fire fighters Personal Protective Equipment (PPE), Self Contained Breathing Apparatus (SCBA), uniform, and patient care. On scene of the incident the on-duty MCFRS Shift Safety Officer started the formal investigation by impounding all the PPE, SCBA, and uniform from RS703 Driver. The gear involved was kept in possession of the Safety Section until it was turned over to the investigation team for further evaluation.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

There is no system wide policy for PPE. All Montgomery County Fire and Rescue PPE meet or exceed NFPA 1971: Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting. Currently, the LFRD's purchase PPE for its members and may use any manufactures gear as long as it complies with the current issue of NFPA 1971 for the year that it was manufactured. In 2006, PPE was issued to the majority of MCFRS personnel (career and volunteer) through an Urban Area Security Initiative (UASI) grant and Fire Chief General Order (FCGO) 06-04, Urban Area Security Initiative – UASI PPE dictates its use and care.

There are three FCGO's 05-03 Mandatory Use of Turnout Pant Suspenders, 05-10 Helmets and 06-04 Urban Area Security Initiative – UASI PPE provide direction to all MCFRS personnel and DFRS Policy & Procedure #804 Protective Clothing and Equipment that provides direction to career personnel. The LFRD's may have their own PPE policy.

Recommendation: It is recommended that a MCFRS Policy and Procedure be developed to encompass all PPE specifications, purchasing, use, care & cleaning.

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On the date of the incident RS703 Driver was wearing the following:

	Coat	Pants
Make:	Cairns	Cairns
Model:	RS1	RS1
S/N:	2714458	2714471
NFPA Standard	1971-2000	1971-2000
Outer	7.5 oz PBI Kevlar Gold	7.5 oz PBI Kevlar Gold
Thermal	Caldura Aralite Quilt	Caldura Aralite Quilt
Moisture barrier:	Crosstech on BJ	Crosstech on BJ
Size	46 x 36	36 B3 B3
Length	32	34
Date Manufactured	4/04	4/04
Date Last Cleaned	7/3/08	7/3/08

Note – coat and pants were made for the fire fighter as RS703 Driver's name was printed/stamped on the coat and pant data sheet

	Helmet	Hood
Make:	Cairns	Life Liners
Model:	Sam Houston	9723ES
Order/Lot #	B-Lth	218
NFPA Standard	1971-2000	1971-2000
Size	79E495_	One Size
Eye protection	Adj	
Misc	S905	
Shop Order #	100380135	
Date Manufactured		8/05

	Boots	Gloves
Make:	Warrington	American Firewear
Model:	Pro XX	
Order	B-Lth	
NFPA Standard	1971-2000	
Size	undetermined	

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	Station Shirt	Station Pant
Make:	Excalibur	Excalibur
Model:	--	--
Description	Short Sleeve	Station Pant
Size	15 18 ½	36
NFPA Standard	Non-compliant	Non-compliant
Composition	65% polyester 35% cotton	65% polyester 35% cotton

	Tee Shirt
Make:	Haines
Model:	--
Size	XLG
NFPA Standard	Non-compliant
Composition	100% cotton

Based on the interviews of the injured fire fighter and other personnel on the scene it was determined that the injured fire fighter had all PPE on and was wearing it with exception of the ear flaps on the helmet.

PPE INSPECTION AND CLEANING

There is currently no policy or procedure for all MCFRS concerning PPE Inspection and cleaning. MCFRS Policy & Procedure #804 Protective Clothing and Equipment and #812 Station Safety Inspections and FCGO 06-04 cover career personnel and UASI PPE. Many of the LFRD's have their own policies.

The PPE Coat and Pant worn by the injured fire fighter was cleaned and repaired in July 2008 by Maryland Fire Equipment Corporation.

Recommendation: It is recommended that a MCFRS Policy & Procedure be developed for the inspection and cleaning in accordance with the NFPA 1851 *Standard on Selection, Care and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting* and quarterly inspection of PPE as part of the Station Safety Inspection program

PPE ANALYSIS

The injured fire fighter's PPE coat and pant was sent to International Personnel Protection, Inc. in Austin, Texas for analysis. A comprehensive report was provided to the SIIG, detailing their findings and conclusions, which correlate the fire fighter's injuries with physical evidence found on the PPE. A copy of the report can be found in Appendix 8 – PPE Report.

“This report describes my examination of the protective clothing worn by during a fire on October 2, 2008. This protective clothing included both a protective coat and pair of protective pants. There was no evidence of thermal damage that would have compromised the protective properties of the clothing and contributed to the fire fighters' burn injuries.

Due to the observation of only the mildest thermal damage and moderate soiling for the clothing items examined, it is my opinion that the fire fighter sustained burn injuries due to his extended exposure in a fire room where high levels of heat existed. These conditions were in excess of the protective qualities of this clothing. It is believed that the burn injuries occurred as the result of stored energy that was transferred to the skin when the fire fighter fell into the basement. It is also believed that some flame contact may have occurred in the basement room further increasing the heat transfer to lesser protected areas of the fire fighter's body.

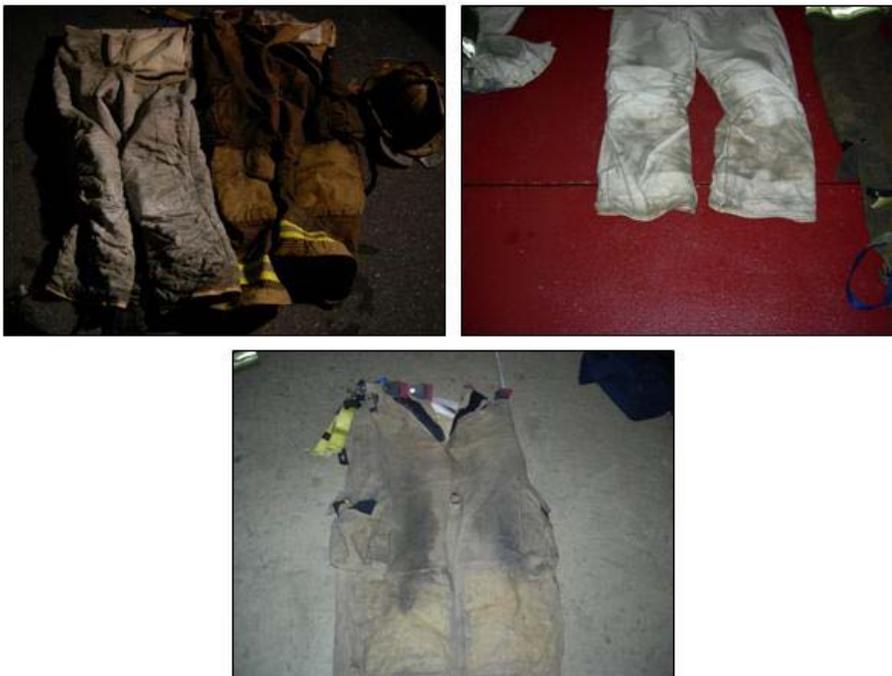
There were no apparent deficiencies or defects found in any of the clothing items that were examined.”

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Figure 51: Turnout Coat



Figure 52: Turnout Pants



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Figure 53: Helmet

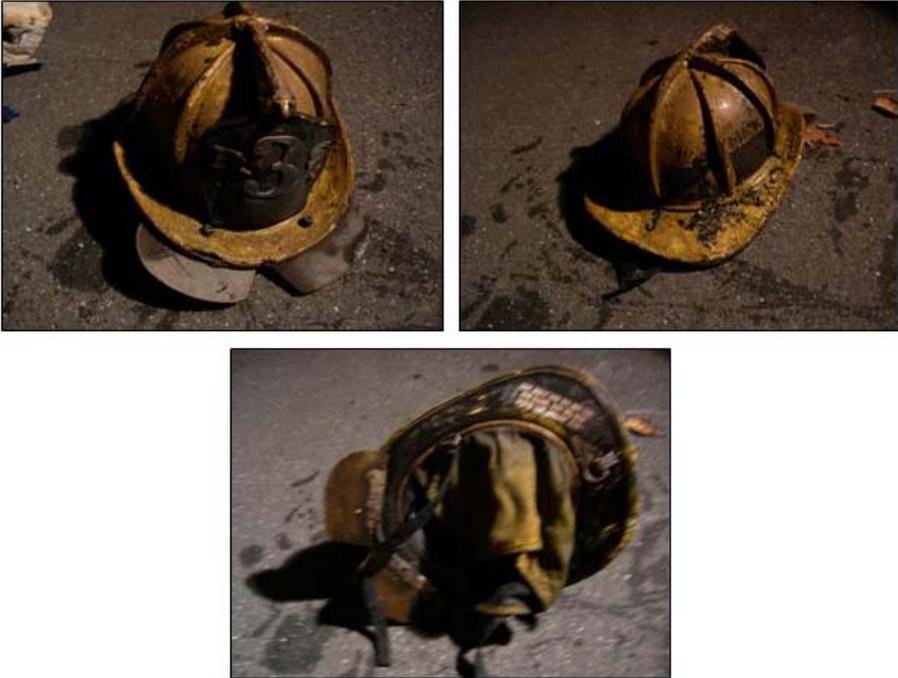


Figure 54: Gloves



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Figure 55: Boots and Hood



UNIFORMS

Each LFRD develops its own policies and procedures and purchases its own uniforms for its members. There is no standard followed for what LFRD personnel are required to wear. The station uniform is not considered in the Total Heat Loss (THL) and Thermal Protection Performance (TPP) of MCFRS gear.

On the date of the incident the injured fire fighter was wearing a uniform issued by the RVFD. The shirt was a short sleeved button down shirt by Excalibur and made of a 65% polyester and 35% cotton blend. The pants were also by Excalibur and made of a 65% polyester and 35% cotton blend. The fire fighter was wearing a 100% cotton T-shirt made by Hanes. The injured fire fighters socks and the rest of the under garments were discarded before the investigation group could review.

The fire fighter's uniform did not play a role in the sustained injuries.

SELF CONTAINED BREATHING APPARATUS (SCBA)

MCFRS uses the Scott Health and Safety Air Pack 50 4.5 with 45 minute cylinder and the AV3000 face piece. These units were placed in service February 2005.

The MCFRS Respiratory Protection Policy #26-06AM was revised in April 2005 and includes requirements consistent with the provisions established in OSHA Regulation 29 CFR 1910.134. The policy outlines provisions for the selection, fit testing, maintenance, repair, and safe use of all components of respiratory protection equipment, and the medical evaluations, training certifications, and record keeping required for the fire and rescue service personnel who use them. Certain requirements of this policy also establish safety procedures for use when these

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personnel perform operations in atmospheres that are immediately dangerous to life and health.

SCBA Use on the Incident

RS703 Driver was using MCFRS SCBA #0392 with an issued AV3000 face piece. The SCBA was assigned to E703/1 and it is unknown why this unit was on RS703.

RS703 Driver stated the SCBA used came from the drivers SCBA location on RS703. The SCBA backpack and cylinder assembly was removed to allow extrication from the basement via the window on SIDE DELTA of the structure.

The initial inspection on the scene by the Safety Officer found waist and shoulder straps were pulled tight and the straps on the face piece were pulled tight. The face piece showed noticeable heat cracks. The SCBA was impounded by the Safety Officer and transferred to the MCFRS SCBA Shop. The MCFRS SCBA Shop transferred the SCBA to the Fairfax County Fire and Rescue Department SCBA Technical Services Shop for analysis.

SCBA 0392 Service History

The unit was placed in-service with MCFRS on March 17, 2005 and assigned to Fire Station 3 and assigned to E703/1 (driver) position. The unit was manufactured by Scott Health and Safety: Model Air-Pak 4.5; Regulator Number REG0502009944AF; Reducer Number RED0502008441AB.

The unit received its annual flow test in 2006, 2007 and 2008. The last time the unit was in the MCFRS SCBA Shop was on February 4, 2008 for its annual flow testing. The unit has only required its annual testing and maintenance with minor repair issues found.

Fairfax SCBA Shop Analysis

MCFRS SCBA 0392 was received at the Fairfax SCBA facility on October 3, 2008 and secured until it was tested on October 6, 2008. The SCBA Inspection report can be found in Appendix 7.

The following is a brief summary of their findings:

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The SCBA cylinder was in good condition with minor smoke stains. The gauge cover was broken and the cylinder bumper and guard assembly plate were bent. The cylinder was estimated to have 200 PSI remaining.

Hoses were in good condition with no obvious defects. HUD hose found turned 180 degrees.

Regulator was in fair condition. Torn air saver boot and cracked on right side of cover

Back frame and straps in fair condition

Mask appears in good condition. Scratches found on lens.

Pak-Alert, console & gauge lines appear good.

The SCBA Shop performed a number of tests:

Mask Test with injured fire fighters mask. The mask passed all tests.

Regulator test with REG 0392. The regulator passed all tests.

Functional Test with RED 0392. . The reducer passed all tests.

All parts from SCBA 03921 were tested together. All parts passed.

During the post test evaluation the SCBA Shop tore the unit down and found some parts that needed maintenance and cleaning. The facility made repairs as noted and returned the SCBA to the MCFRS SCBA Shop.

The evaluation report noted:

“Nothing remarkable concerning the condition of SCBA 0392. As stated previously, there was no evidence any of the equipment evaluated was exposed to extreme conditions. Scuff marks on bottom of cylinder may indicate SCBA was damaged from drop or fall. All equipment had some debris when received cylinder, reducer, regulator and mask cleaned up prior to returning.”

SCBA 0392 Disposition

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SCBA 0392 was returned to the MCFRS SCBA Shop on 10/10/2008 where it was inspected and returned to Fire Station 3 to be placed back in-service.

Face Piece Fit Test

Records provided from the MCFRS SCBA Shop showed that RS703 Driver completed the required annual fit tests for the AV3000 face piece size large on August 18, 2008.

RS703 Driver was wearing the issued face piece at the time of the incident.

PATIENT CARE

RS703 Driver was treated and transported to the Burn Center at The Washington Hospital Center by Medic 723.

The SIIG asked the EMS Section to perform a review of the EMS response. The report provided by the MCFRS EMS Quality Assurance Officer stated that the paramedic in-charge followed all protocols and provided the best patient care for the injured fire fighter. Transport times were also reviewed and found to be acceptable.

Additionally the SIIG reviewed the allocation of EMS units to the event in respect to the SSSFFO.

The initial dispatch at 01:36:17 included Ambulance 723. Ambulance 703 and Medic 703, from station 3, were committed to other events and thus Ambulance 723 from the second due station was dispatched.

Ambulance 723 arrived and positioned on Westmore Avenue off of Frederick Avenue. The crew assembled their stretcher and EMS equipment and established an aid station on SIDE ALPHA. The crew then assisted the AT723 Driver with exterior truck company operations prior to the mayday being called. When the mayday was called the crew proceeded to SIDE DELTA with their stretcher and assisted in moving RS703 Driver to the stretcher and then to Medic 723's unit. Ambulance 723 Officer assisted Medic 723 with transport to the Washington Hospital Center while Ambulance 723 Driver remained on scene.

Medic 723, also from station 23, was dispatched as part of the Rapid Intervention Dispatch (RID). The SSSFFO dictates that an ALS unit be dispatched if one is not

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already on the scene when ECC determines the incident is a working fire or when the units on the scene report a working fire.

Medic 723 arrived on scene at 01:50:58, just less than two minutes prior to the first mayday. Upon being called by Command, Medic 723 advised that:

01:54:53 Medic 723

Medic 723 on the RID reporting to SIDE DELTA

As stated earlier, the SSSFFO outlines that an ALS unit be dispatched as part of the RID, if an ALS unit is not already on the incident. The SSSFFO defines the Rapid Intervention Group (RIG) as consisting of the fourth engine and the units from the RID.

If the ALS unit had been part of the initial dispatch and not the RID, the SSSFFO definitions provide a loop hole for the ALS unit not to be assembled with the RIG.

Recommendation: Amend the SSSFFO to require the ALS unit be included in the RIG. The duties and responsibilities of the ALS on the RIG must be defined such that they assemble with PPE and ALS equipment at the RIG.

Consider amending the SSSFFO to require an ALS unit be dispatched as part of the RID.

Upon the mayday occurring, Command called for two additional medic units. This was discussed in depth previously as related to the mayday task force. See Mayday Task Force.

BURN INJURIES CAUSE

The SIIG met with staff from the Washington Hospital Center Burn Unit to review the photos taken of the injured fire fighters PPE. Based on the PPE analysis provided by International Personnel Protection, Inc. in Austin, Texas, consultation with staff at Washington Hospital Center Burn Unit and the group's investigation RS703 Drivers PPE performed as designed and the injuries were caused by compression of the air space in the PPE after it had been exposed to excessive heat.

Glossary

Ambulance: An EMS transport unit that provides Basic Life Support (BLS) care to patients.

Battalion: A geographical response area.

Circle Check: The act of walking around an emergency incident to conduct a scene size up. Synonymous with 360° survey of the structure.

Command: Position within the Incident Command System that is responsible for the overall management of the incident. Synonymous with the term Incident Commander.

Computer Aided Dispatch (CAD): A combination of hardware and software that provides data entry, makes resource recommendations, notifies and tracks those resources before, during, and after alarms, preserving records of those alarms and status changes for later analysis.

Command Post (CP): Location at which primary command functions are executed.

Cross lay: Refers to a hose line that is racked across the apparatus and is designed to be deployed by one fire fighter.

Division: A level of organization within the Incident Command System. Divisions are used to divide an incident into geographical areas of operation.

Division/Group Supervisor: An incident command system position responsible for supervising personnel and resources assigned to a division or group.

Emergency Communications Center (ECC): Work location for MCFRS Communications personnel.

Emergency Evacuation: The immediate withdrawal of personnel from a structure or area.

Engine: Refers to fire apparatus that are equipped with a pump and carry water and fire hoses.

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Exposure: Refers to a structure in the vicinity of the fire building. Exposures are commonly identified with a letter and a number to describe the location of the structure relative to the fire building (e.g., Bravo-3 Exposure, Charlie-1 Exposure).

General Order: An MCFRS Fire Chiefs General Order (FCGO) is a directive that orders one or more persons, either by name or by class/group, to take a specific action or series of actions and is of interest to all MCFRS personnel.

Gallon Per Minute (GPM): A unit of measurement that describes the rate of fluid flow. Typically used to refer to the amount of water flowed through a hose line or the capacity of a pump.

Group: A level of organization within the Incident Command System. Groups are used to divide an incident into functional assignments (e.g., rescue, ventilation, salvage, water supply, etc.).

Hose line: Fire fighters use hose to move water from one place to another. Hose lines are described by their size (diameter).

1 ¾ inch hose line: Primary hose line used for fire attack in Montgomery County.

Immediately Dangerous to Life or Health (IDLH): An atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

Incident Action Plan (IAP): The IAP is developed by the Incident Commander and addresses the objectives that reflect the overall incident strategy, tactics, risk management, and member safety. These plans are updated throughout the incident.

Incident Commander (IC): Position within the Incident Command System that is responsible for the overall management of the incident. Synonymous with the term Command.

Incident Command System (ICS): An Incident Command System (ICS) defines the roles and responsibilities to be assumed by responders and the standard operating procedures to be used in the management and direction of emergency incidents and other functions.

Integrated Emergency Command Structure (IECS): Integrated Emergency Command Structure, Montgomery County Executive Regulation 16-05AM, provides

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a chain of command for use in the control of all incidents, and applies to all Montgomery County Fire and Rescue Service personnel.

MAYDAY: A term used to report fire fighters who are lost, trapped, disoriented, or in a life threatening situation.

Medic Unit: A patient transport unit that provides advanced life support (ALS) care to patients.

MWCOG: Acronym for the Metropolitan Washington Council of Governments. MWCOG is a regional organization, comprised of 21 local governments surrounding the nation's capital, members of the Virginia and Maryland legislatures, the U.S. Senate, and the U.S. House of Representatives.

National Incident Management System (NIMS) – In February 2003, President Bush issued Homeland Security Presidential Directive (HSPD)-5, which required all federal departments and agencies to adopt a system that provides a consistent approach incident response and includes a core set of concepts, principles, and terminology. That system is now known as NIMS.

PAR Check: Acronym for Personnel Accountability Report. PAR checks are radio reports, initiated by the Incident Commander, at predetermined points in the incident. During PAR checks, unit officers report the total number and accountability of members assigned to their unit, the area they are operating in, and indicate the number of people operating outside of the hazard zone.

PASS Device: Acronym for a Personal Alert Safety System. A device that senses movement and is designed to automatically activate an alarm signal indicating the wearer is in need of assistance. The device can also be manually activated to trigger the alarm signal. PASS devices may be integrated into the SCBA or a standalone device.

Personal Protective Equipment (PPE): Equipment and clothing required to reduce the risk of injury from, or exposure to, hazardous conditions encountered during the performance of duty. PPE consists of helmet, hood, coat, pants, boots and gloves that comply with NFPA 1971 Standard, *Protective Ensemble, Structural Fire Fighting*; SCBA that meet NIOSH certification and NFPA 1981 Standard, *Open-Circuit Self Contained Breather Apparatus for Fire Service*, including the integrated PASS device that complies with NFPA 1982 Standard, *Personal Alert Safety Systems for Fire Fighters*.

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Personnel Accountability System: A system that readily identifies both the location and function of members operating on an incident scene.

Rapid Intervention Company (RIC): A team consisting of at least two fire fighters, including one officer, which is immediately available to respond to requests for help from lost, trapped or incapacitated fire fighters [normal the 4th engine by SSSFFO]

Rapid Intervention Dispatch (RID): The dispatch of a rescue squad, an aerial (truck or tower), and an EMS unit (ALS if not already on scene) This dispatch is sent at the request of the incident commander or the ECC personnel if 911 calls indicate a working event.

Rapid Intervention Group (RIG): A combination of crews consisting of the fourth engine (a RIC) and the units from the RID.

Rescue Squad: Name given to fire apparatus in Montgomery County that is used to carry specialty equipment such as vehicle extrication equipment, rope rescue equipment, and confined space equipment.

Safety Officer: Responsible for monitoring and assessing safety hazards, unsafe conditions, and developing measures for ensuring personnel safety during an incident.

Self-Contained Breathing Apparatus (SCBA): An atmosphere-supplying respirator that supplies breathing air to the user from a source that is independent of the ambient environment and designed to be carried by the user.

SIDES ALPHA, BRAVO, CHARLIE, and DELTA: Geographical designation that refers to the sides of a building, clockwise from the front. See Figure 1: Terms Used to Describe Building Sides and Interior Quadrants

Situational Awareness: The knowledge of being aware of a situation as it actually exists.

Size Up: The objective of the size-up is to identify the nature and severity of the immediate problem and gather sufficient information to formulate a valid action plan.

SOP for Safe Structural Firefighting Operations (SSSFFO): Montgomery County Fire and Rescue Service (MCFRS) Policy and Procedure 24-07AMII dated December 1, 2005. Standard response assignments for structure fires help to ensure operational safety, effectiveness, and efficiency

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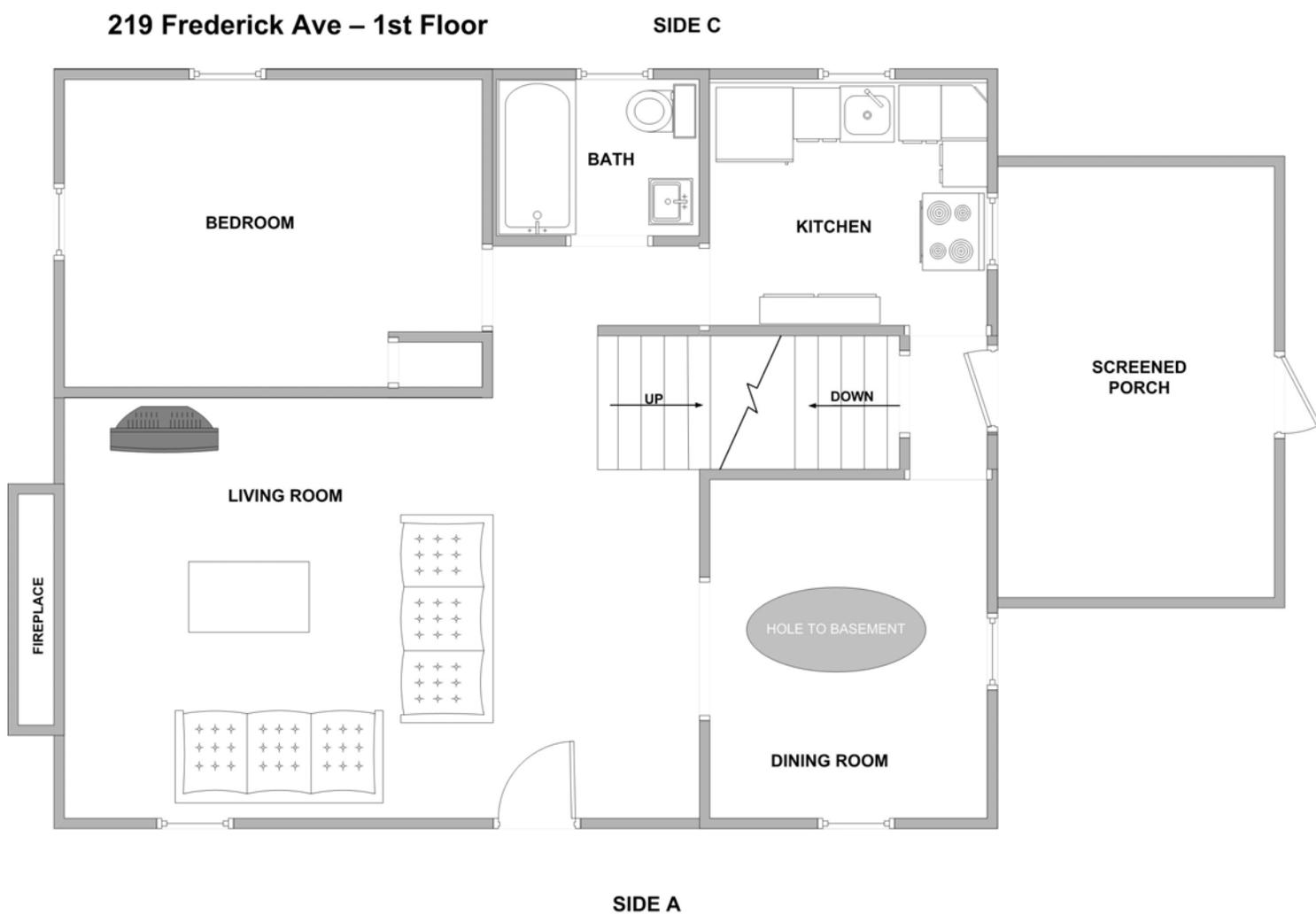
Thermal Imaging Camera (TIC): A camera that uses infrared technology to locate victims during search and rescue operations and locate hidden fire.

Truck: Refers to fire apparatus that are equipped with an aerial ladder, but do not have a platform for personnel to work off of or out of.

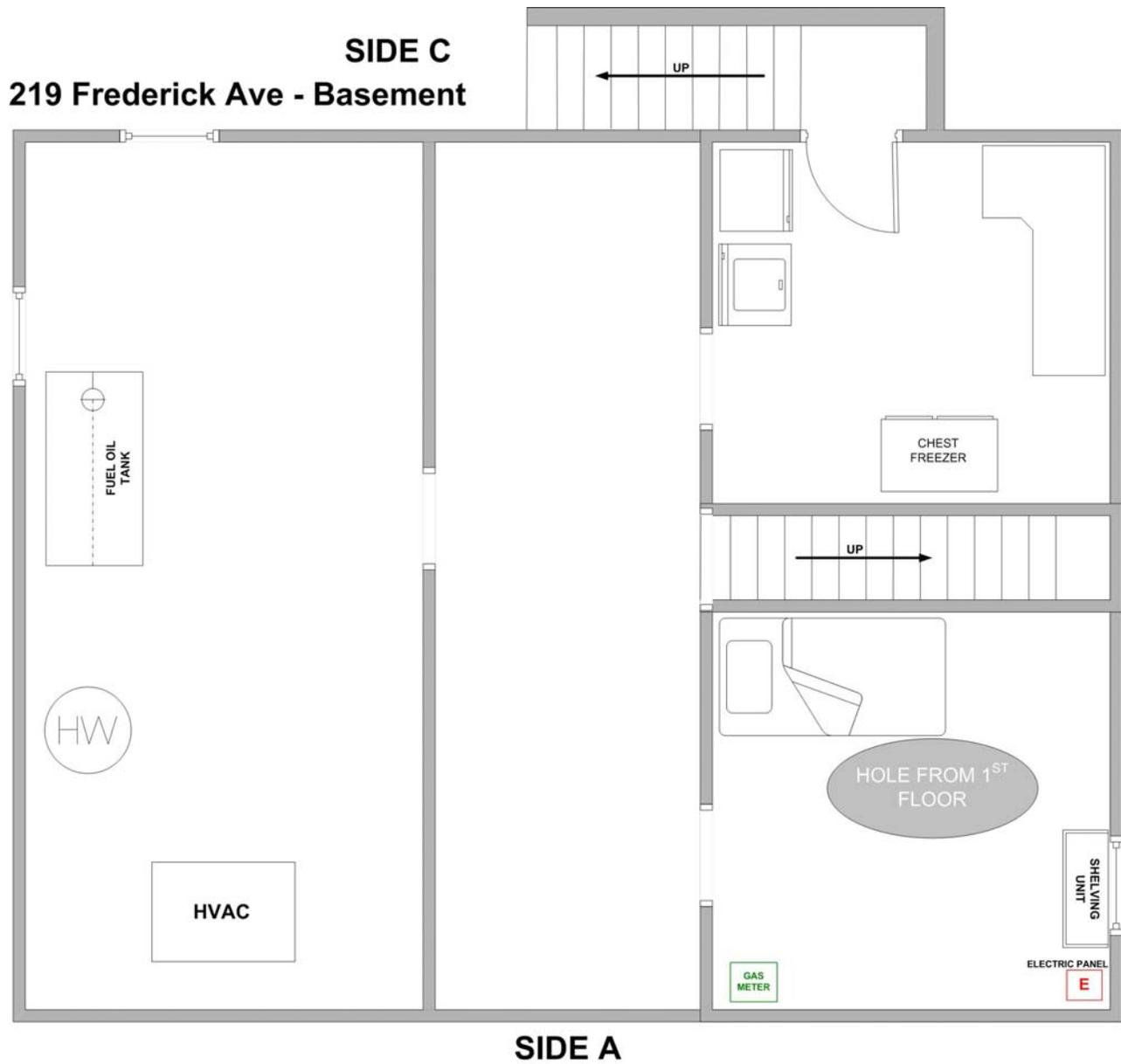
Tower: Refers to fire apparatus that are equipped with an aerial ladder and a platform for personnel to work off of or out of.

Type III Construction: As classified by the International Building Code - Type III construction is that type of construction in which the exterior walls are of noncombustible material and the interior building elements are of any material permitted by this code.

Appendix 1 – Floor Plans



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Appendix 2 – Recommendations

The SIIG categorized the recommendations using the following terms:

Immediate Issue/recommendation that must be implemented immediately to impact fire fighter safety and/or fire department operations.

Estimated Time to Implement: 30 days

Short Term Issue/recommendation that's solution can be created studied and implementation plan created and that may requires moderate - engineering/financial/policy adjustment and/or coordination.

Estimated Time to Implement: 60 to 120 days

Long Term Issue/recommendation that requires extensive engineering/financial/policy adjustment and/or coordination.

Estimated Time to Implement: +6 months

#	Recommendation	Category
	Operations	
1	MCFRS needs to monitor Turnout Time and take steps to achieve the goal of 60 seconds or less.	Immediate
2	The initial entry team must not make entry unless a stand-by team is in place or as defined by SSSFFO. It is recommended that ECC or Command confirm critical orders are relayed by units that do not acknowledge their receipt.	Immediate
3	It is recommended that unit officers be aware of available personnel on the scene that can be utilized as the two-out crew.	Immediate
4	Notification from water utilities pertaining to hydrant status must be accurately entered into CAD. This data must then be readily available to all responding units via premise information or Altaris, CAD mapping software, flagging. Any hydrant rated to flow less than 1,000 gpm should be flagged. Also, those hydrants that cannot produce 500 gpm should be identified with a ring.	Long Term

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#	Recommendation	Category
5	Unit officers must communicate to Command when they are unable to complete an assignment. While establishing an alternate plan face to face with critical parties solves the immediate problem, Command must be notified of deviations from SOP.	Immediate
6	<p>It is recommended that the unit officer: Prioritize the assigned tasks; maintain crew integrity; accomplish the tasks safely; communicate completed or uncompleted tasks up the chain of command; and not assume other unit's tasks without communicating this change</p> <p>SSSFFO and Executive Regulation 26-04 <i>Personnel and Unit Accountability Systems</i> need to be modified to incorporate the tenets of this recommendation.</p>	Immediate
7	Hydraulic ventilation must only be performed after the fire is confirmed to be contained.	Short Term
8	<p>MCFRS needs to define and develop SOP's for operations involving vacant, unoccupied, and abandoned structures.</p> <p>These SOP's must include risk/benefit analysis, marking the structure as abandoned, potential hazards within, maintaining a current and updated list of these structures in CAD and for personnel to access for response, training and knowledge.</p>	<p>Immediate</p> <p>Long Term</p>
9	<p>Increase staffing at the Command Post by developing incident management teams. This can be accomplished in a variety of ways, including:</p> <ul style="list-style-type: none"> • Assigning a command aide to all rostered command officers. • All command officers must report to the Command Post ready for an operational assignment. • Utilize on-scene resources to assist with command functions. 	Short Term

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#	Recommendation	Category
	Risk vs. Benefit	
10	Revise SSSFFO to include a section to address the subject of Risk/Benefit Analyses in fire ground operations. This new Risk/ Benefit section should include a section on Search Assessment including a risk/benefit analysis of searching without the protection of a hose line as well as operating on a floor above an un-checked fire.	Short Term
11	Revise the SSSFFO Basement Fire section to provide the option for the IC to direct an initial exterior knock down of the fire from a basement window for basement fires where there is no exterior basement entrance.	Short Term
12	Revise the SSSFFO basement fire section in reference to structures where an exterior basement entrance exists. This section should provide the IC the option to direct the initial hose line to attack the fire directly by using the exterior entrance in certain situations, particularly when it is believed there is no perceived rescue problem and there are no interior crews operating above the fire, or if there would be a significant delay in getting the second hose line into position to make the attack from the exterior entrance.	Short Term
	Accountability	
13	Revise Fire and Rescue Commission Policy and Procedure 26-04 dated 1/1/2009 to correct the terminology to conform to NIMS terminology. Add provisions to allow PAS tags to be collected at Group, Branch, or Division Level at the discretion of the incident commander as appropriate. Assure that all foreseeable incidents are adequately covered by an accountability system.	Short Term
14	Amend Executive Regulation 26-04 <i>Personnel and Unit Accountability Systems</i> to state that individual responders are responsible to be accountable to the company (unit) officer.	Immediate

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#	Recommendation	Category
15	All personnel must follow Personnel and Unit Accountability Policy #26-04 and be assigned to apparatus by either the volunteer officer or career officer. Upon receiving that assignment, said crew member must check in with the unit officer of the apparatus to which they were assigned.	Immediate
16	<p>Enforce the existing Executive Regulation # 26-04 <i>Personnel and Unit Accountability</i> section 5.a.</p> <p>It is recommended that the Personnel and Unit Accountability regulation be reviewed for possible updating and consider implementation of the Washington COG PASSPORT standard accountability system.</p>	<p>Immediate</p> <p>Long Term</p>
17	<p>Enhance crew/unit accountability crew integrity and operational discipline by</p> <ul style="list-style-type: none"> • Crew/team leaders are responsible to ensure accountability of personnel. • It is mandated per OSHA/MOSH 1910.134 that crews/teams must be minimum of 2 qualified personnel and they must maintain visual or verbal contact. (radio contact does not meet the standard) • Enforcing SSSFFO, Section I Definitions x. Team, requiring that each crew/team must be lead by a minimum of a Fire fighter/Rescuer III • No one enters IDLH structures as an individual. • All crews/teams must have at least 1 portable radio. 	Immediate
18	Command officers and any person entering the IDLH must operate as a team, as outlined in OSHA 1910.134 and Executive Regulation 26-04 <i>Personnel and Unit Accountability</i> . Single persons must be married with a partner or crew before entering the IDLH. Assigning command aides to all command officers will provide a solution.	Immediate

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#	Recommendation	Category
19	<p>Mayday</p> <p>Revise the SSSFO to permit the basement fire attack by the first due engine to begin, in certain cases, before establishing an attack line to hold the basement stairs. For example, an immediate attack could occur if the Incident Commander believes the fire can be knocked down before a search team is in place to operate on the floors above.</p> <p>Policy should also allow the Incident Commander to begin a basement fire attack, without a hose line holding the basement stairs, in a building that is believed to be unoccupied where the suppression benefits would outweigh the search benefits. This will prevent units from being in place and dangerously waiting above an unchecked fire when the reasons for occupying that high risk position are dubious and attacking the fire immediately would be the most prudent action</p>	Short Term
20	<p>A training program needs to be implemented for the Mayday protocol. This training should be delivered in as many forms and formats as possible from quick daily/shift recitations of the basic steps in declaring a Mayday, to periodic practical, hands on evolutions where personnel act as victims and rescuers. This training should be required for all ranks, from recruits to command officers and at all advancement ranks in between.</p>	Short Term
21	<p>An analysis of high risk low frequency fire ground situations, such as a Mayday situation, should occur. Where practical, required action steps should be reduced to quick action reference cards which are then placed for rapid retrieval on Command vehicles.</p>	Immediate
22	<p>A thorough evaluation of the SSSFFO Mayday Incident Command procedures should occur. This should include consideration to immediately order radio silence so that a rapid personnel accountability check can occur. Consideration should be given to eliminating the radio channel change over.</p>	Short Term

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#	Recommendation	Category
23	MCFRS should incorporate the tenets of the NOVA RIT Manual into the SSSFFO or stand alone Mayday policy. Additionally MCFRS should work with MWCOG Fire Chief Committee to develop a standardized Mayday/Rapid Intervention procedure for the region to include radio silence.	Long Term
24	MCFRS should create a separate comprehensive MAYDAY Policy for all non structure fire incidents. For example, the MAYDAY policy does not cover the following potential incidents where a MAYDAY could be declared; a chemical terrorist incident, a HAZMAT incident, a confined space incident, etc.	Short Term
Communications		
25	Amend the SSSFFO to change the “pre-alert tone” to “alert tone.” Additionally the Safe Structural Firefighting Policy must be change to allow the incident commander to use the tone as needed during a Mayday and on any event/incident.	Immediate
26	<p>Amend the SSSFFO to allow the incident commander to determine if they will switch all units not involved in the mayday to an alternate tactical talk group. Considerations to switching talk groups should include:</p> <ul style="list-style-type: none"> • Sufficient staffing at the command post to properly monitor/operate multiple talk groups. • Sufficient voice radio hardware to support multiple talk group operations. • If not switching talk groups – all units on the tactical talk group, not involved in the mayday, should be instructed to maintain radio silence and to continue their tactical assignments. 	Short Term
27	Amend the SSSFFO to allow the Incident Commander to have the option of determining whether units are to be switched to an alternate talk group, and to allow units in the vicinity of the MAYDAY to remain on the MAYDAY operations talk group.	Short Term

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#	Recommendation	Category
28	Amend the SSSFFO to allow the Incident Commander to declare RADIO SILENCE instead of switching units to an alternate talk group when a MAYDAY is declared. The use of the alternate talk group should still remain the preferred option when conditions are ideal, but the Incident Commander should have the option to use radio silence.	Short Term
29	Add Command Aide positions to each on duty career Battalion Chief. In addition to augmenting normal battalion operations, this would provide invaluable help in transferring command and the action plan to the any chief thrust into operational command when the original Incident Commander is occupied with MAYDAY operations. This would allow the command chart to be maintained and transferred without interruption. Encourage the use of volunteer Battalion Aides for volunteer duty chiefs to attain a similar benefit.	Long Term
30	Remove the Mayday Task Force selection from CAD and provide communication to the personnel at ECC about its removal.	Immediate
31	<p>Issue a Fire Chief General Order that significantly reduces the amount of communication on the tactical channel. The limits should include:</p> <p>During the initial phases of the event, no radio transmissions will be made on the Tactical Talk Group with the exception of:</p> <ul style="list-style-type: none"> • Water supply instructions • Initial on scene reports • Establishing or assumption of Command • Communications critical to the event (e.g. SIDE CHARLIE and basement reports, any unexpected hazards, occupant information, deviations from SOP, etc. from field units or ECC.) • Arrival of the first certified chief officer 	Immediate

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#	Recommendation	Category
	Personnel Training and Certification	
32	Ensure that E703 is staffed at all times with a minimum of four qualified personnel, with a certification of Fire Fighter II or greater.	Immediate
33	It is recommended that all personnel understand and follow the limitations of Executive Regulation 21-06AM, Certification Standards for Training, Experience, and Credentialing Requirements as it relates to Fire Rescue Candidates entering IDLH atmospheres during emergency response.	Immediate
34	Amend the Apparatus Staffing Policy to limit the number of candidates and observers allowed to ride apparatus.	Long Term
35	Amend FCGO 05-10 to specify the abilities of all IECS certified personnel and their abilities operation in an IDLH	Short Term
	Equipment	
36	It is recommended that all MCFRS vehicles be equipped with a MDC and reserve units must either have a MDC or have a docking mount installed to allow movement of the MDC from the primary to the reserve unit.	Long Term
37	It is recommended that a new functionality be added to CAD to allow units not dispatched on an event to add themselves to an active event.	Long Term
38	It is recommended that all MCFRS engines, trucks and rescue squads will be equipped with radio/intercom headsets for each riding position.	Long Term
39	It is recommended each unit will have the required amount of SCBA on it at all times. If a unit goes down for maintenance then a spare unit will be put in place of the unit that is OOS. If insufficient spares are available in the station then arrangements will be made with the SCBA Shop for a loaner unit. This recommendation complies with NFPA 1901 5.8.3 requiring each assigned seating position to have an SCBA.	Immediate

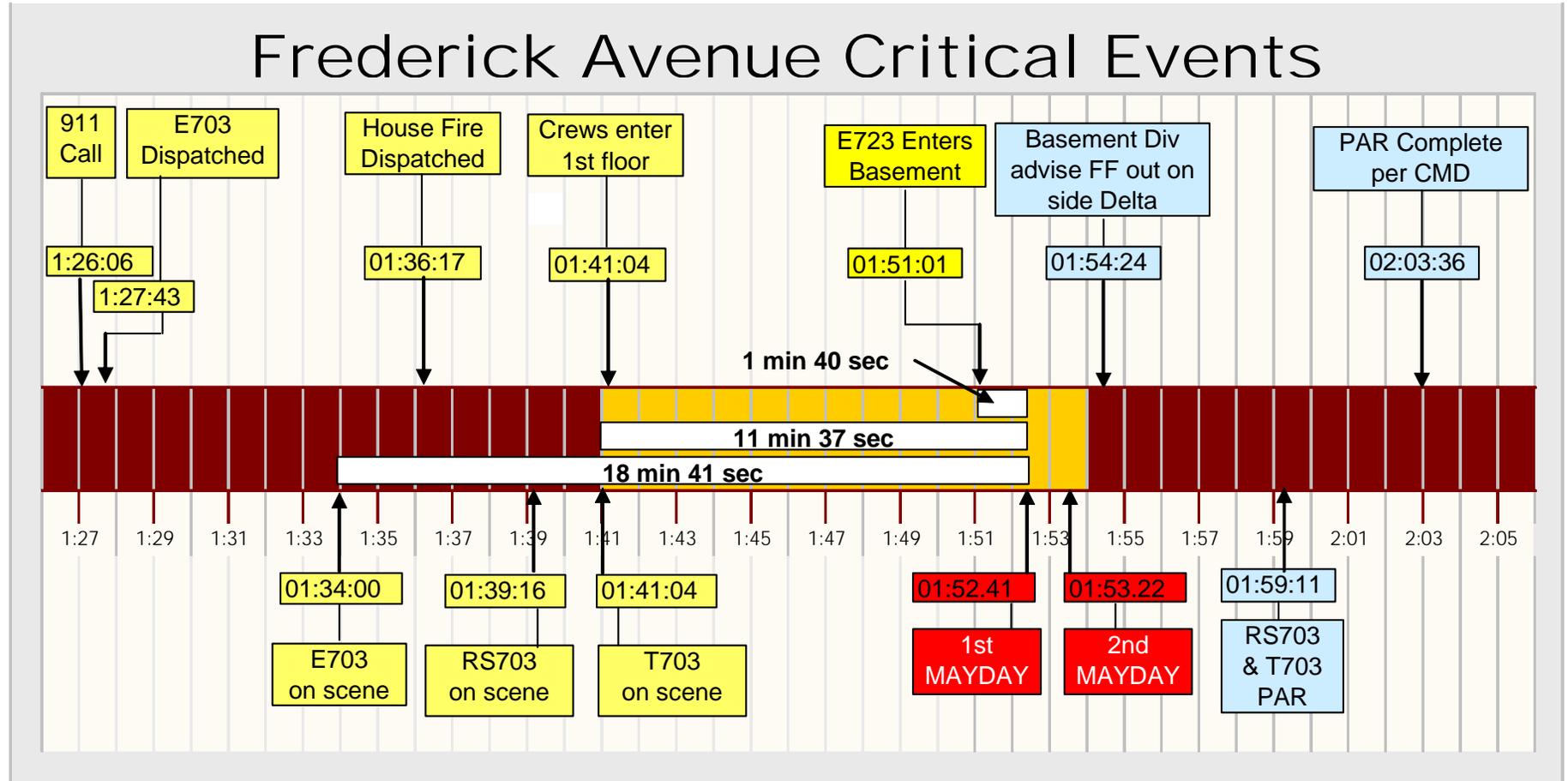
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#	Recommendation	Category
40	It is recommend when sending SCBA out for its annual flow testing, if more units need to go then spare SCBA's are available then they must be spaced out over the required month to prevent a shortage or arrangements should be made to acquire a loaner unit from the SCBA Shop.	Immediate
41	It is recommended that all primary MCFRS units be equipped with one portable radio per SCBA equipped riding position.	Immediate
42	It is recommended that all portable radios be checked when assuming a riding position and the personnel must have the radio when on incidents.	Immediate
43	It is recommended that all crews equipped with Thermal Imaging Cameras bring and use them in any limited visibility environments. Additionally equip all primary units, engines/aerials/rescue squads, are equipped with Thermal Imaging Cameras.	Immediate Long Term
44	Amend the SSSFFO to require that all personnel carry a hand light as part of their PPE. Ensure all riding positions are equipped with re-chargeable hand lights.	Immediate
Injured Fire fighter PPE and SCBA		
45	It is recommended that a MCFRS Policy and Procedure be developed to encompass all PPE specifications, purchasing, use, care & cleaning.	Long Term
46	It is recommended that a MCFRS Policy & Procedure be developed for the inspection and cleaning in accordance with the NFPA 1851 <i>Standard on Selection, Care and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting</i> and quarterly inspection of PPE as part of the Station Safety Inspection program	Long Term

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#	Recommendation	Category
47	<p>Amend the SSSFFO to require the ALS unit be included in the Rapid Intervention Group (RIG). The duties and responsibilities of the ALS on the RIG must be defined such that they assemble with PPE and ALS equipment at the RIG.</p> <p>Consider amending the SSSFFO to require an ALS unit be dispatched as part of the RID.</p>	Short Term

Appendix 3 – Timeline Chart



Appendix 4 – Radio Audio Transcribed

Bold and italic text indicates actual 911 or radio transmissions as transcribed

Time	TG	Unit or Position	Message/Task
1:26:26	911	CAD44	1st 911 call - call from 222 Frederick Ave - reporting "top of pole on fire" and "its smoking."
1:27:19	CAD		F08-0101673 enters pending for Transformer.
1:27:43	7A		Call dispatched.
1:27:47	911	CAD44	1st 911 call for Transformer ends.
1:30:00	7B		2nd vocal of Engine 703 transformer fire.
1:30:19	MDC		Engine 703 en-route.
1:31:20	911	CAD46	2nd 911 call - Caller at 216 Frederick Ave advises that the "house is on fire across the street" "sees flames on side of the house."
1:33:05	911	CAD46	2nd 911 call ends.
1:34:00	7B	E703	<i>Engine 703 on scene 219 Frederick Ave I have a 1 1/2 story single family basement on fire, start the box, I will have command.</i>
1:34:05	MDC		Engine 703 on scene.
1:35:00	D/L	CAD40	<i>PEPCO notified of transformer fire.</i>
1:35:23	CAD		Call type changed to House.
1:36:00	D/L	CAD46	FS3 notified of working house fire at 219 Frederick Ave.
1:36:00	7B		Engine 703 advised to switch to 7C.
1:36:17	7A		House fire Dispatched - <i>To fill box 3-7 219 Frederick Ave Engine 703 on scene basement fire Engine 723, Engine 721, Engine 733, Engine 725, Truck 703, Tower 723, Rescue Squad 703, Ambulance 723, Battalion 703, Battalion 704, Rockville and Kensington Duty Officers.</i>
1:37:28	7C	C703C	<i>Chief 703 from Station 3 - Excuse me Chief 703C from station 3.</i>
1:37:35	7C	ECC	<i>Ok Chief 703C.</i>
1:37:37	7C	RS703	<i>Rescue Squad 703.</i>
1:37:43	7C	ECC	<i>OK Rescue Squad 703.</i>
1:38:02	7C	C703	<i>Chief 703 responding.</i>
1:38:09	7C	E723-Driver	<i>703 you got any water supply yet.</i>

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Time	TG	Unit or Position	Message/Task
1:38:13	7C	E703	<i>That's correct we just got it, Engine 703 to Montgomery, I got command 1 1/2 story single family - got fire in the basement. Our line is on Lenmore Ave. just off Frederick ,Have the 2nd engine pick it up. Truck 3, Truck 703 is my 2 out.</i>
1:38:37	7C	E703	<i>Also be advised I have a reported vacant house.</i>
1:38:44	7C	E723-Driver	<i>Where was your line on Frederick Ave?</i>
1:38:50	7C	E703	<i>Its on Lenmore just off Frederick.</i>
1:38:54	7C	E723-Driver	<i>Engine 723's got it.</i>
1:38:57	7C	T703	<i>Truck 3 responding.</i>
1:38:59	7C	E725	<i>Engine 725's going.</i>
1:39:09	7C	E703-Driver	<i>Squad make sure the hydrant's charged.</i>
1:39:16	7C	RS703	<i>Rescue Squad 703 on scene.</i>
1:39:25	7C	E721	<i>Engine 721's en-route.</i>
1:39:28	7C	ECC	<i>Ok Engine 721.</i>
1:39:32	7C	C703C	<i>Chief 703C on the scene assuming command - have fire showing on SIDE DELTA, alpha Quadrant.</i>
1:39:47	7C	ECC	<i>Ok Chief 703C now has Frederick Command.</i>
1:39:55	7C	DC700B	<i>Duty Chief Bravo from Station 10.</i>
1:40:02	7C	BC703	<i>Battalion 703.</i>
1:40:02	7C	ECC	<i>Ok Duty Chief Bravo.</i>
1:40:06	7C	T703	<i>Truck 3 responding.</i>
1:40:12	7C	C703F	<i>Chief 703F from 33.</i>
1:40:14	7C	ECC	<i>Ok Chief 703F.</i>
1:40:14	7C	<i>unknown</i>	<i>Ok charge that hydrant.</i>
1:40:16	7C	C703	<i>Chief 703.</i>
1:40:23	7C	SA700	<i>Safety 700 responding.</i>
1:40:27	7C	ECC	<i>Ok Safety 700.</i>
1:40:31	7C	C703B	<i>Chief 703B.</i>
1:40:35	7C	ECC	<i>Ok Chief 703B.</i>
1:40:42	7C	ECC	<i>Ok Safety 700.</i>
1:41:04	7C	T703	<i>Truck 3 on scene.</i>
1:41:07	7C	ECC	<i>Ok Truck 703.</i>
1:41:12	7C	C703	<i>Chief 703 on the scene.</i>
1:41:14	7A		Rapid Intervention Dispatch - AT725, RS742, M723.

Frederick Avenue - Significant Injury Investigation Report

Time	TG	Unit or Position	Message/Task
1:41:18	7C	CMD	<i>Chief 70, excuse me, Command to Montgomery let me have you go to Delta give me a run down please.</i>
1:41:34	7C	CMD	<i>Command to Engine 703 do you have a rear entrance.</i>
1:42:21	7C	RS742	<i>Rescue Squad 742.</i>
1:42:25	7C	ECC	<i>Rescue squad.</i>
1:42:28	7C	ECC	<i>Ok Rescue Squad 742.</i>
1:42:28	7C	AT725	<i>Tower 725.</i>
1:42:31	7C	ECC	<i>Ok Tower 725.</i>
1:42:35	7C	C705D	<i>Chief 705D.</i>
1:42:38	7C	ECC	<i>Ok Chief 705D.</i>
1:43:04	7C	E733	<i>Engine 733 to Engine 721 what hydrant are you going to use?</i>
1:43:33	7C	CMD	<i>Command to Engine 703.</i>
1:43:37	7C	E703	<i>Go ahead.</i>
1:43:40	7C	CMD	<i>Do you have a rear entrance to this house?</i>
1:44:06	7C	CMD	<i>Command to Engine 703.</i>
1:44:11	7C	E703	<i>Go ahead.</i>
1:44:13	7C	CMD	<i>You will be Basement Division, You will have Engine 703, Engine 723, and Truck 703 in your Division.</i>
1:44:28	7C	RS703	<i>Rescue Squad 703 to command - We have located basement steps - the engine is preparing to make entry down the basement.</i>
1:44:40	7C	CMD	<i>Commands direct.</i>
1:44:44	7C	C703	<i>Chief 703 to command - you have a rear entrance to the basement.</i>
1:44:50	7C	CMD	<i>Command to Engine 703 there is a rear entrance to the basement - go ahead and hold up and I will have Engine 723 pull a line in to protect the steps.</i>
1:45:07	7C	CMD	<i>Command to Engine 723.</i>
1:45:12	7C	E703	<i>Engine 703 to command - we are at the top of the steps holding it in check right now with a hand line.</i>
1:45:21	7C	CMD	<i>I'm direct - Command to Engine 723.</i>
1:45:25	7C	E723	<i>Yes line to the front door - protect the stairs correct.</i>

Frederick Avenue - Significant Injury Investigation Report

Time	TG	Unit or Position	Message/Task
1:45:30	7C	CMD	<i>That's negative I think uh I think Engine 703 has a line protecting the stairs - I think I need you to go to the rear - and make entry in the rear - there's a rear entrance - basement fire.</i>
1:45:41	7C	E723	<i>Copy rear - line.</i>
1:45:45	7C	CMD	<i>Engine 703 you will be Division 1 - you copy Division 1.</i>
1:45:55	7C	C703	<i>Call the gas company it looks like you have a gas feed fire or something in the basement that's flammable liquid.</i>
1:46:03	7C	CMD	<i>Command to Montgomery.</i>
1:46:07	7C	E723-Driver	<i>Engine 723 to Command.</i>
1:46:10	7C	Montgomery	<i>Montgomery go ahead command.</i>
1:46:13	7C	CMD	<i>Make sure we get the gas company on the way please it looks like we have a gas feed fire.</i>
1:46:17	7C	Montgomery	<i>Ok we are on it - PEPCO's also en-route.</i>
1:46:23	7C	CMD	<i>I am direct - Command to Division 1 Engine 703.</i>
1:46:31	7C	E721	<i>Engine 721 to Engine 733 - we are laying out at Frederick Ave and uh North Stone Street - pick up our line please – acknowledge.</i>
1:46:42	7C	E723-Driver	<i>Pickup my line on Westmore.</i>
1:46:46	7C	CMD	<i>Command to Engine 703.</i>
1:46:55	7C	E703	<i>Go ahead for Engine 703.</i>
1:46:59	7C	CMD	<i>Just confirming that you are holding the fire at the top of the steps correct.</i>
1:47:04	7C	E703	<i>That's correct - I have myself and Rescue Squad 3 with me.</i>
1:47:09	7C	CMD	<i>Ok I am going to have Engine 703, Truck 3, be Division 1 at the top of the steps - Chief 703F will coming with you to assume that Division in just a few moments.</i>
1:47:27	7C	E703	<i>I did not copy that last transmission - who else do I have.</i>
1:47:33	7C	CMD	<i>That's Engine 703, Truck 703 will be Division 1 at the top of the steps you will have Chief 703F will be joining you in just a moment.</i>
1:47:43	7C	CMD	<i>Command to Rescue Squad 3.</i>
1:47:48	7C	RS703	<i>Rescue Squad 703 go ahead.</i>

Frederick Avenue - Significant Injury Investigation Report

Time	TG	Unit or Position	Message/Task
1:47:51	7C	CMD	<i>Rescue Squad 703 you will be the rescue group leader give me a report on the occupants at this time - your search please.</i>
1:48:03	7C	RS703	<i>Rescue Squad 703 to command we are still doing our primary.</i>
1:48:09	7C	CMD	<i>Thank you. Give me a report when you get it.</i>
1:48:16	7C	E723	<i>Engine 723 to command - I need a confirmation on my orders - am I going in the front door or am I going to the rear.</i>
1:48:25	7C	CMD	<i>Command to Engine 723 you are going in the rear - in the back - basement entrance - you will be basement division - you and tower - Is Tower 723 with you?</i>
1:48:41	7C	Unknown	UNKNOWN
1:48:45	7C	E725	<i>Alright Engine 725 to Command I am 5th due engine company I am on the alpha side of the structure - what assignment do you have for me at this time.</i>
1:48:57	7C	CMD	<i>Engine 725 assist Engine 723 in the basement - that's around to the rear entrance.</i>
1:49:06	7C	E725	<i>Alright Engine 725 will deploy a line to the Charlie side and back up company 23, Ok.</i>
1:49:14	7C	CMD	<i>Command is direct. Thank you.</i>
1:49:18	7C	BC703	<i>Battalion 703 is on the scene, do you have an assignment?</i>
1:49:23	7C	CMD	<i>Battalion 703 Please take basement Division.</i>
1:49:29	7C	Basement	<i>I copy basement.</i>
1:49:32	7C	C703	<i>Chief 703 command I am on SIDE CHARLIE, company 23 units are preparing to enter the basement, we've confirmed with units on the first floor that they are holding at the stairs.</i>
1:49:45	7C	CMD	<i>Command's direct.</i>
1:49:48	7C	BC704	<i>Battalion 704 is on scene.</i>
1:49:53	7C	CMD	<i>Battalion 704 take safety please.</i>
1:49:58	7C	BC704	<i>I copy safety.</i>
1:50:05	7C	unknown	<i>(Open Mic)</i>
1:50:09	7C	ECC	<i>Montgomery to command.</i>

Frederick Avenue - Significant Injury Investigation Report

Time	TG	Unit or Position	Message/Task
1:50:10	7C	CMD	Command to Chief 703 you'll be Chi, ch, uh, SIDE CHARLIE please.
1:50:17	7C	Charlie	Ok, I need some light's back here please.
1:50:22	7C	E723	Engine 723 to Montgomery.
1:50:30	7C	CMD	Command to Truck 703 Driver, can you bring lights around to the rear please?
1:50:43	7C	E725	Engine 725 to Engine 723's - driver charge that 2nd line.
1:50:49	7C	Div. 1	Division 1 command, they're in, they're ready for the basement attack, have them go ahead.
1:50:55	7C	E723-Driver	(Feedback) Can't charge it till I get water on it --they wanna go in.
1:51:01	7C	Charlie	SIDE CHARLIE command, 23 units are entering the basement now.
1:51:08	7C	CMD	Command's direct.
1:51:11	7C	Safety	Safety to command.
1:51:14	7C	CMD	Go ahead safety.
1:51:17	7C	Safety	Whatever unit laid out from Frederick and Westmore, nobody picked up their line yet.
1:51:24	7C	CMD	Command to Engine 733.
1:51:29	7C	E733	We picked up, uh, 3rd due's Engine Company', uh, line. There is no 6th Engine company to take care of uh, that last hydrant.
1:51:42	7C	CMD	Engine 733 are you positioned to pick up that hydrant.
1:51:47	7C	E733	Negative, we picked up the hydrant on Stone Street.
1:51:52	7C	CMD	I'm direct, uh, Command to Engine 721.
1:52:04	7C	CMD	Command to Engine 721.
1:52:12	7C	DC700B	Duty Chief Bravo is on the scene.
1:52:16	7C	Charlie	SIDE CHARLIE to Engine 723, charge that 2nd line please.
1:52:22	7C	CMD	Command to Engine 723, go ahead and charge that 2nd line please.
1:52:31	7C	CMD	Command to Engine 721.
1:52:41	7C	T703	Mayday, Mayday, Mayday.
1:52:47	7C	CMD	Command to the last message, repeat?

Frederick Avenue - Significant Injury Investigation Report

Time	TG	Unit or Position	Message/Task
1:52:52	7C	Div. 1	<i>Division 1 to command. The floor has given way on the first floor; I'm backing the guys out of Division 1 at this point.</i>
1:53:01	7C	CMD	<i>Commands direct.</i>
1:53:09	7C	RS742	<i>Rescue Squad 742's on the scene.</i>
1:53:18	7C	T725	<i>Tower 725's on the scene.</i>
1:53:22	7C	T703	<i>Mayday, Mayday, Mayday, this is Truck company 703.</i>
1:53:32	7C	CMD	<i>Command to Truck 703 go ahead with your Mayday.</i>
1:53:37	7C	T703	<i>Through the floor, at this time all I can tell you is we have several unaccounted for.</i>
1:53:50	7C	C703F	<i>Division 1, Division 1, all units in Division 1, I need you to back out now!</i>
1:53:57	7C	CMD	<i>Units on the fire ground, all units on the fire ground, switch to 7-Delta.</i>
1:54:06	7C	CMD	<i>Chief 703B will be on Delta.</i>
1:54:15	7C	E703	<i>Engine 703 to command.</i>
1:54:20	7C	CMD	<i>Go ahead 703.</i>
1:54:24	7C	Basement	<i>Battalion 703 to command your Mayday is occurring in the Delta Quadrant of the first floor, have one fire fighter that has come out the window, being taken for medical treatment. Have crews opening, entering Division 1 SIDE DELTA for the Mayday.</i>
1:54:43	7C	CMD	<i>Command to Montgomery, let me have two Medic units on the scene, all EMS units to SIDE DELTA, SIDE DELTA at this time.</i>
1:54:51	7C	ECC	<i>Montgomery's direct.</i>
1:54:53	7C	M723	<i>Medic 723 on the RID reporting to SIDE DELTA.</i>
1:54:58	7C	RS742	<i>Squad 742 to command, I'm on the scene I'll be approaching the house shortly for the RIG.</i>
1:55:05	7C	CMD	<i>Command to the Mayday unit, do you copy me, command to the Mayday Unit.</i>
1:55:14	7C	T703	<i>This is Truck Company number 703.</i>
1:55:23	7C	CMD	<i>Can you give me your LUNAR?</i>
1:55:28	7C	C703F	<i>Alright, Division 1 to Command.</i>
1:55:42	7C	CMD	<i>Command to Engine 703.</i>

Frederick Avenue - Significant Injury Investigation Report

Time	TG	Unit or Position	Message/Task
1:55:51	7C	CMD	Command to Division 1.
1:56:05	7C	Basement	Battalion 703 to the Basement Division, confirm that you have fire fighter [name redacted] with you.
1:56:16	7C	C703F	Division 1 accounted for.
1:56:20	7C	E725	Engine 725 to command, repeat the name of that fire fighter again.
1:56:28	7C	CMD	Command to all units on the fire ground, Command to all units on the fire ground, not, not on the Mayday, switch over to 7-Delta, all units on the fire ground not involved in the Mayday switch to 7-Delta.
1:56:49	7C	RIG	Rapid intervention to command.
1:56:54	7C	CMD	Go ahead, go ahead RIG.
1:56:58	7C	RIG	RIC to command , we're at the top of the stairs, the rescue squad and engine in the basement are ok, do we have someone on the first floor.
1:57:11	7C	CMD	Command to RIG, be advised the first floor, per Division 1 was evacuated.
1:57:32	7C	Basement	Battalion 703 to Command.
1:57:36	7C	CMD	Command to all units on the fire ground, comman-comman-excuse me Command to the RIG, give me an accountability please.
1:58:00	7C	Basement	Command to er , Battalion 703 to Command.
1:58:09	7C	CMD	Battalion 703 go ahead.
1:58:15	7C	Basement	We're moving everybody from the basement division at this time for the purpose of providing accountability, looking for one specific person...that I just found him, I believe at this point we are PAR.
1:58:30	7C	CMD	Ok, Command to Battalion 703 if you can go ahead and get a PAR down there and give me the units that you have so I can, I can ensure that I have everybody out of the building.
1:58:47	7C	M723	Medic 723 to Command.
1:58:51	7C	CMD	Medic 723 switch to 7-Delta.
1:59:02	7C	Unit 2	Unit 2 to Command.
1:59:07	7C	CMD	Go ahead.

Frederick Avenue - Significant Injury Investigation Report

Time	TG	Unit or Position	Message/Task
1:59:11	7C	Unit 2	[names redacted] were on Rescue Squad 703, they're all accounted for at this time, the officer of Truck 703 has assured me his crew is now PAR, Copy.
1:59:18	7A		to assist fill the assignment on the Mayday Task Force - RS741.
1:59:26	7C	CMD	So, got Truck 703, Rescue Squad 703 were the only people involved in this, in in this MAYDAY, correct?
1:59:36	7C	Unit 2	They were the initial; I'm waiting on, uh Battalion 703 to advise further.
1:59:42	7C	CMD	Commands direct, thank you.
1:59:44	7C	Basement	Battalion 703 to Command, the Basement Division is PAR. With Engine 723, Engine 725 and the 2 remaining members from Rescue Squad 703 including [name redacted] who was one of the missing parties.
2:00:05	7C	CMD	Command to Battalion 703, so we are PAR for this MAYDAY, correct?
2:00:13	7C	Basement	We are PAR on my side, based on what I see in Truck 3 and Rescue Squad 3 I do not believe we have any missing fire fighters but you'd have to confirm that on the front side.
2:00:25	7C	Unknown	Unknown
2:00:31	7C	CMD	Squad-Battalion 703 can you please repeat your message?
2:00:37	7C	Unknown	Unknown
2:00:41	7C	Basement	Battalion 703 to Command, I am PAR with the Basement Division, I believe based on the MAYDAY we are clear , I would like a crew to do a very quick sweep of the first division, one crew and I'll be able to confirm that for you.
2:01:07	7C	CMD	Commands direct. Command to Montgomery.
2:01:11	7C	ECC	Go ahead Command.
2:01:14	7C	CMD	Go ahead and give me a (unintelligible) Please.
2:01:19	7C	ECC	Sir you broke up, try again.
2:01:28	7C	ECC	Montgomery to Command your message broke up, try again.
2:02:03	7C	ECC	Montgomery to Command.

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Time	TG	Unit or Position	Message/Task
2:02:08	7C	RIG	RIG to Command.
2:02:27	7C	RS742	Rescue Squad 742 to Command primary search of the number 2 floor is clear at this time.
2:03:09	7C	RIG	RIG to Command.
2:03:19	7C	ECC	Montgomery to Command.
2:03:23	7C	CMD	Go ahead command, go ahead Montgomery.
2:03:26	7C	Montgomery	Yeah, can you give the name of the FF that was missing from Engine 733.
2:03:36	7C	CMD	Standby Montgomery um, as far I am being told at this time I just wanted to give you a heads up that we have a PAR, on all of the initial units, uh, as far as the injured fire fighter give me a couple of minutes and I'll get you the information.
2:03:53	7C	E703-Driver	Engine 703 Driver to Command PEPCO 's here.
2:04:00	7C	Montgomery	Montgomery to Command.
2:04:51	7C	Div. 1	Division 1 to Command.
2:05:07	7C	CMD	Command to Division 1, PAR please.
2:05:11	7C	Div. 1	Yes, I'm accounted for Engine 703, Truck 703, are accounted for ,we're all PAR.
2:05:21	7C	CMD	Command to Battalion 703, basement.
2:05:29	7C	Basement	Battalion 703 I'm PAR with Engine 725 and Engine 723 in the basement.
2:05:42	7C	CMD	Commands Direct.
2:05:43	7C	CMD	Command to Rescue Squad 3, 703.
2:05:54	7C	Unknown	(Keyed Mic)
2:06:18	7C	CMD	Command, Montgomery.
2:06:20	7C	Montgomery	Go ahead Command.
2:06:28	7C	Unknown	(Open Mic) Why don't you go down there ---- fire fighter [name redacted]
2:06:42	7C	Montgomery	Montgomery to Command also be advised that we had a report of a fire fighter that missed the call at Station 33, his last name is [name redacted]. My fault, last name [name redacted].
2:07:00	7C	CMD	Commands Direct.
2:07:02	7C	Montgomery	And also you have a MAYDAY Taskforce en-route.
2:07:20	7C	CMD	(Open Mic) Command to Montgomery is that Engine 726, Engine... Engine 723 and Aerial Tower 31.

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Time	TG	Unit or Position	Message/Task
2:07:31	7C	ECC	<i>Engine 726, Engine 728, Tower 731, Canteen 733, Air 733.</i>
2:07:39	7C	CMD	<i>Go ahead and stage them at North Horners and Frederick please.</i>
2:07:51	7C	Div. 1	<i>Alright Division 1 to Command.</i>
2:07:55	7C	CMD	<i>Go ahead Division 1.</i>
2:07:58	7C	Div. 1	<i>Just wanted to make sure your aware I've got an open gas meter, heavy odor of gas in the front of the structure I've started to pull people away from the structure I'm thinking we probably should get the people off the roof as well, until I can get the gas controlled, the gas meter is in the basement at the seat of where the fire was located.</i>
2:08:21	7C	Basement	<i>Basement Division to Command, the gas has been controlled at the meter inside.</i>
2:08:32	7C	CMD	<i>Command to the unit that just confirmed the gas, you said the gas was turned off?</i>
2:08:39	7C	Basement	<i>Battalion 703, that is correct.</i>
2:08:51	7C	CMD	<i>Commands direct on the gas, thank you.</i>
2:09:04	7C	M725	<i>Medic 725 to Command, we're at Frederick and (unintelligible) staging, unless you have a patient or a job for us.</i>
2:09:18	7C	CMD	<i>Command to Medic 725 go ahead and come up to the scene.</i>
2:09:24	7C	M725	<i>Ok.</i>
2:09:50	7C	CMD	<i>Command to Division 1.</i>
2:09:59	7C	CMD	<i>Command to Division 1.</i>

Appendix 5 – Decision Memorandum Riding Assignments at FS3



MONTGOMERY COUNTY FIRE AND RESCUE SERVICE

Isiah Leggett
County Executive

Thomas W. Carr, Jr.
Fire Chief

MEMORANDUM

August 28, 2008

TO: Distribution

FROM: Division Chief Philip G. Guercio *PG*
Division Chief Richard Bowers *RB*

SUBJECT: Decision Memorandum – Riding Assignments at FS 3 (AMENDED)

This memorandum replaces the memorandum of July 30, 2008. This document contains changes not incorporated in the original version. These changes are a result of feedback from the training sessions and subsequent discussion on riding assignments and the direction from Chief Carr on utilization of the FF III to ride in the unit officer position.

On June 3, 2008 a series of memorandums compiled, endorsed, and forwarded to the Operations Division Chief regarding the operation of FS 3 were received. The documents were analyzed and a series of joint meetings between representatives of the RVFD and the career management were held to address the issues raised in the series of memorandums.

Chief Bowers and I have jointly decided that the following practice for establishing riding assignments at FS 3 will be implemented following the training of career and volunteer personnel. This decision is based upon input and discussion from the stated meetings.

ROCKVILLE FIRE STATION 3
RIDING ASSIGNMENT PRACTICE
IMPLEMENTATION DATE: August 28, 2008 @ 1700 hours

1. During weekday hours (Monday – Friday, 0700-1700) the ranking career officer has sole authority to make riding assignments for all personnel.
 - Volunteer personnel desiring to ride the apparatus must receive an assignment from the ranking career officer.

Office of the Fire Chief

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- Volunteer personnel available to respond but who have not received a riding assignment must request and receive permission from the unit officer to ride on a specific call following the receipt of the alarm.
2. During nights and weekends (Monday – Friday 1700-0700 and 24 hours on Saturday and Sunday) career personnel will first staff the 1st engine and the medic unit. The Volunteer personnel will initially staff the Aerial Tower, Rescue Squad, and Ambulance.
 - The career officer will assign the compliment of career personnel. This staffing compliment will include one officer, two heavy apparatus drivers (minimum engine and rescue squad), two paramedics, and a firefighter qualified to drive EMS units. Except in extraordinary circumstances scheduling will provide six individuals with the stated qualification and not utilize personnel with duplicate qualification to meet this staffing level. Scheduling will not up-staff FS 3 unless requested by the LFRD or directed by the DOC/Operations Division Chief.
 - The career personnel will staff the medic unit with one medic and the most suitable driver of the career compliment. The medic unit will remain staffed and personnel from the medic unit will not be utilized for other riding assignments unless replaced by a qualified volunteer. Personnel from the medic unit will not be utilized to prevent another unit at FS 3 from failing to respond.
 - The RVFD stand-by crew leader, or their designee, will assign the RVFD personnel to staff the aerial tower, rescue squad, and ambulance.
 3. During those situations where the RVFD cannot fill all the designated riding positions with qualified personnel the volunteer stand-by crew leader will confer with the career officer to develop an exchange of personnel that will better enable the in-station career and volunteer personnel to staff the required 14 riding positions with qualified personnel. The career station officer will support moves that most effectively utilize the career personnel compliment composed of the officer, two heavy drivers and firefighter/paramedic to staff the required riding positions that the RVFD cannot fill.
 4. Career personnel should not be moved to from one riding assignment to another unless volunteer personnel are in quarters and riding in a position for a MINIMUM of 4 hours.
 5. Final staffing assignments must be completed by 2300 hours each night and no movement should occur after that unless agreed upon by the affected individuals.
 6. Any career and volunteer personnel can exchange riding assignments upon mutual consent by the career officer and the volunteer stand-by crew leader.
 7. Career personnel, with the exception of those personnel assigned to Medic 703 will move riding assignments as necessary to prevent a unit from failing to respond.

The utilization of the FF III to ride in the unit officer position must be consistent with the procedure outlined below:

- The FF III, career or volunteer can ride in the unit officer position to prevent a unit from failing.

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- The volunteer FF III who is currently designated by the LFRD Chief and approved by the Chief Carr can ride the unit officer position when adequate numbers of personnel are in quarters to fill the required positions but an adequate number of Captains, Lieutenants, or Master Firefighters are not available. In this circumstance the MCFRS CERTIFIED FF III can serve in the unit officer position. These personnel will be required to complete the MCFRS unit officer command competency program when implemented to retain this authority.

A formal review of this process will be held in six months. The career and volunteer personnel must work together to most effectively utilize the station's personnel resource to:

- a. Staff the required riding positions on the AFRA engine, aerial tower, rescue squad, medic unit and ambulance with qualified personnel according to these guidelines.
- b. Work together to provide opportunity for career development with mutual exchange of personnel.

Obviously there may be issues as this process is implemented. Successful resolution of these issues will require immediate, detailed documentation of the issue. Career personnel should document those issues and send that documentation to Battalion Chief Mallalieu. The LFRD personnel should send such documentation to Chief Dawson. Chief Dawson and Battalion Chief Mallalieu will communicate jointly on all issues and forward those issues they cannot resolve through the chain of command.

Specific questions regarding implementation of this process can be brought to the Operations Division Chief via the C-O-C.

I want to reemphasize that Chief Bowers and I are jointly issuing this direction. Secondly, he will evaluate the effectiveness of this process and conduct a six month review.

Distribution: Chief Carr
Division Chief Hinde
Assistant Chiefs Rothenhoefer, DeHaven, Prete, Ridgely
Chief Russell Dawson
President Eric Bernard
Deputy Chief Scott Emmons ✓
Deputy Chief James Vagonis
Battalion Chiefs Mallalieu, Holzman, Cooper, Tippet
Captains Green, Polikoff, Henrie

Appendix 6 – Fire Chief’s General Order 08-19

Montgomery County Fire and Rescue Service

FIRE CHIEF’S GENERAL ORDER

NUMBER: 08-19

December 8, 2008

TO: All MCFRS Personnel
FROM: Interim Fire Chief Richard Bowers 
SUBJECT: Communications on Tactical Talk Groups

This Order modifies **MCFRS Standard Communications Manual Policy 22-03AM**, Section 9, page 37, Assignment of Alternate Talk Group(s) – Full Assignments, and Section 12, page 43, On-Scene Reporting and Communications.

Units responding on incidents that have been assigned to a Tactical Talk Group must **not** verbally announce the unit’s status (i.e., responding, on-scene, etc.) on the Tactical Talk Group. These verbal announcements must be made on 7 Bravo (or 71 Bravo; 72 Bravo; etc.). After a unit’s status has been acknowledged on 7 Bravo (or 71 Bravo; 72 Bravo; etc.), that unit must switch to the Talk Group(s) assigned to the incident.

During the initial phase(s) of the event, no radio transmissions will be made on the Tactical Talk Group, except for:

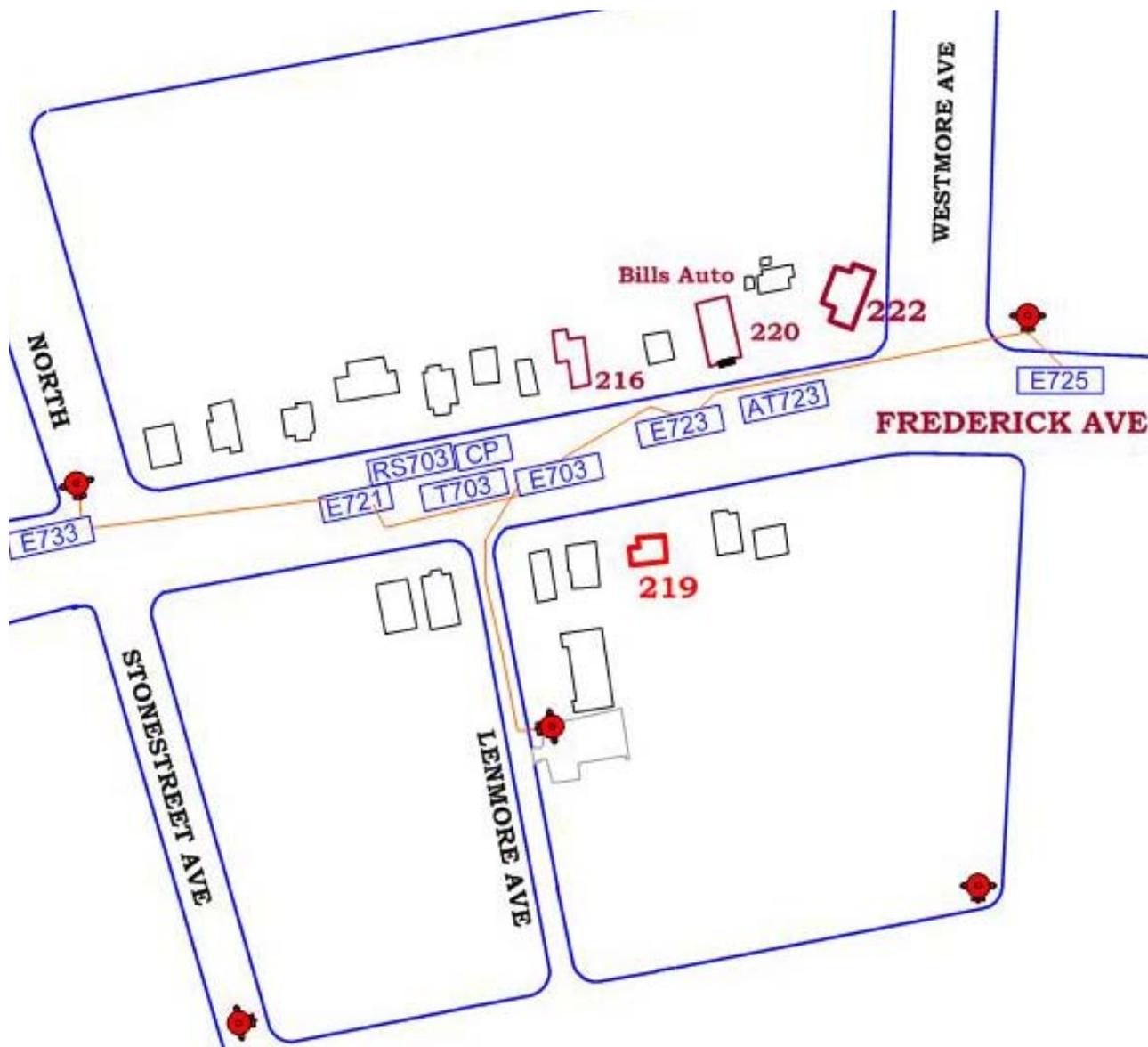
- Water Supply instructions;
- Initial on-scene reports;
- Establishment or assumption of Command;
- Communications critical to the event from field units or ECC, e.g., Side Charlie and basement reports; discovery of any unexpected hazards; occupant information; deviations from the SOP; etc.; and
- Arrival of the first Certified Chief Officer

Unless directed to deviate from it, personnel must follow the appropriate Standard Operating Procedure. Units without an assignment must report to the Command Post.

Once Command is established, ECC will not announce unit response checks or the second vocal announcement on the Tactical Talk Group.

If you have questions, please contact Battalion Chief Scott Goldstein at (240) 777-2464.

Appendix 7 – Apparatus Diagram



Appendix 8 – PPE Report

International Personnel Protection, Inc.

Jeffrey O. Stull, President and Grace G. Stull, Vice President

October 27, 2008

Captain Neal Trevey
Montgomery County Fire-Rescue Services
15825 Shady Grove Road
Rockville, MD 20850

Dear Captain Trevey:

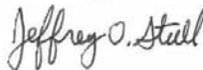
Only the very slightest thermal damage was noted on the firefighter protective garments. This damage occurred primarily to the lower edges of the protective coat on both lower hem and sleeve ends and to the thigh area and lower cuffs of the pants. This damage is generally coincident with the highest levels of soiling. Though you were unable to provide the exact location of the burn injuries, I would expect that the majority of burn injuries occurred to the upper legs (front thighs) and lower arms based on the observed patterns of damage and soiling. It is my opinion that there may have been limited flame contact to the lower edges of the clothing during the firefighter's time in the basement and during his efforts to escape the fire room. Given the lack of any severe damage to the clothing, particularly heat sensitive portions such as trim, it is likely that the burn injuries are principally the result of stored energy that occurs from compression of the clothing against the body (as may have been caused during the fall and contact with debris and during escape efforts). There is also a possibility that some flame impingement to the interface area at the lower sleeves contributed to burn injuries on the arms.

No testing of the clothing was performed and no components of the clothing were removed. The clothing was returned in the same condition as it was received.

I am separately sending the coat and pants. Even though you indicate that there is no pending litigation for this event, I recommend that the Safety Office retain this clothing for at least 2 years following the incident and maintain a chain of custody for this clothing. Since the coat was cut off the fire fighters body, the coat should be properly disposed of following this holding period. It may be possible to remain the tear in the pants and put the pants in service.

Please contact me if you have any questions.

Sincerely,



Jeffrey O. Stull

Enclosure

**EXAMINATION OF
PROTECTIVE COAT AND PANTS
WORN BY FIREFIGHTER [REDACTED]
AT FREDERICK AVENUE FIRE**

**Final Report
October 27, 2008**

Summary

This report describes my examination of the protective clothing worn by during a fire on October 2, 2008. This protective clothing included both a protective coat and pair of protective pants. There was no evidence of thermal damage that would have compromised the protective properties of the clothing and contributed to the firefighters' burn injuries.

Due to the observation of only the mildest thermal damage and moderate soiling for the clothing items examined, it is my opinion that the firefighter sustained burn injuries due to his extended exposure in a fire room where high levels of heat existed. These conditions were in excess of the protective qualities of this clothing. It is believed that the burn injuries occurred as the result of stored energy that was transferred to the skin when the firefighter fell into the basement. It is also believed that some flame contact may have occurred in the basement room further increasing the heat transfer to lesser protected areas of the firefighter's body.

There were no apparent deficiencies or defects found in any of the clothing items that were examined.

Objective

Captain Neal Trevey of Montgomery County Fire and Rescue Services requested an examination of the protective clothing worn by Firefighter [REDACTED] during a structural fire that occurred on October 2, 2008 at 219 Frederick Avenue. The purpose of this examination was to determine if any conditions of the clothing might have contributed to the firefighters' injuries.

Description of the Incident and Fire Fighter Injuries

Captain Trevey provided a description of the incident that Firefighter [REDACTED] was performing a search of the first floor of a two story Cape Cod style home that had a fire in the basement. The floor in the bedroom gave way and Firefighter [REDACTED] fell through to the basement into the room where the fire originated. The fire had just been knocked down prior to his fall. He was able leave the basement on his own through a window. There is no precise amount of time for how long Firefighter [REDACTED] was in the basement, but other firefighters estimate this time to be less than one minute.

Firefighter [REDACTED] sustained burn injuries over 35% of his body surface area. Both second and third degree burns occurred to his arms, legs, and hands.

Frederick Avenue - Significant Injury Investigation Report

Items Examined and Observations

The protective coat and protective pants worn by Firefighter [REDACTED] were provided for examination. The coat was cut open by emergency medical technician at the fire ground. There is also a rip in the fly area of the pants that created in the urgency for removing Firefighter [REDACTED] protective clothing. These items were impounded immediately after the incident and were kept in custody by the Montgomery County Fire and Rescue Safety Office. Specific descriptions and observations for each firefighter's gear are provided in the sections below.

Table 1 provides the identification of the protective garments and observations on their condition:

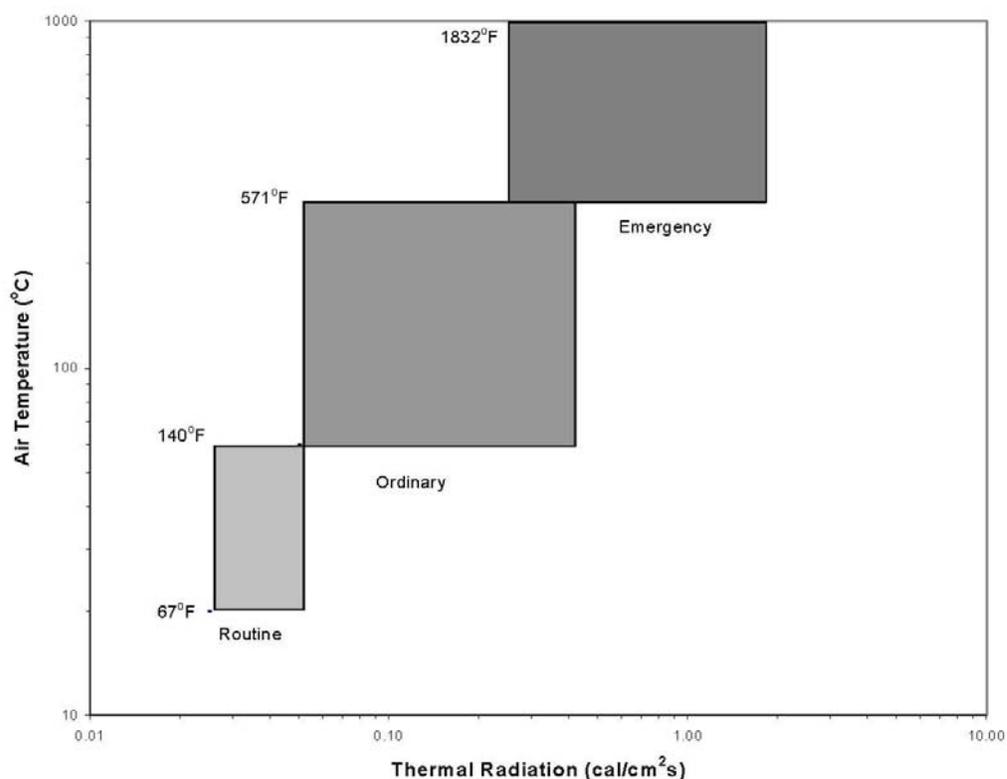
Table 1 – Description and Observations for Firefighter [REDACTED] Protective Garments

Item	Description	Observations
Protective coat	Cairns Protective Clothing Model RS1 Jacket Style # V1084410 Cut # 4B332C Serial # 2714458 Size: 46 inch chest; 32 inch sleeve 35 inch length Date of manufacture: 4/2004 Outer shell: 7.5 osy PBI/Kevlar Gold Moisture barrier: Crosstech on PJ Nomex Thermal barrier: Caldura Aralite Quilt Reinforced sleeve cuffs Lower front cargo pockets (one each side) Upper radio pocket and microphone flap Standard trim pattern with department and firefighter name Compliant with NFPA 1971-2000	Exterior of coat shows mild to moderate soiling and very light thermal damage, particularly on lower sleeves and front bottom torso areas (small spots of tar and resin in same areas); All components fully functional; No damage to trim or hook/loop closure tape; Interior of shell is clean; some light thermal damage to lower hem; Liner shows possible extremely mild charring no effects of exposure; Moisture barrier seam tape in place and in good condition
Protective pants	Cairns Protective Clothing Model RS1 Trouser Style # W1084410 Cut # 4B332P Serial # 2714471 Size: 36 inch waist; 34 inch inseam Date of manufacture: 4/2004 Outer shell: 7.5 osy PBI/Kevlar Gold Moisture barrier: Crosstech on PJ Nomex Thermal barrier: Caldura Aralite Quilt Reinforced knees and pant cuffs Front cargo pockets (one each side) Standard trim pattern Compliant with NFPA 1971-2000	Exterior of pants shows moderate soiling above the knees on both legs; Light thermal damage is evident on upper front thighs from examination of shell interior; All components fully functional; No damage to trim or hook/loop closure tape; Interior of shell is clean though some thermal damage appears at lower cuffs on both sides of liner; Moisture barrier seam tape in place and in good condition

Frederick Avenue - Significant Injury Investigation Report

- The **Routine** region describes conditions where one or two objects, such as a bed or waste basket, are burning in a room. The thermal radiation and the air temperatures are virtually the same as those encountered on a hot summer day. As shown in Figure 30, **Routine** conditions are accompanied by a thermal radiation range of 0.025 to 0.05 cal/cm²s and by air temperatures ranging from 68 to 140°F. Protective clothing for fire fighters typically provides protection under these conditions, but excessively long exposure times may create a burn injury situation.
- The **Ordinary** region describes temperatures encountered in fighting a more serious fire or being next to a "flash-over" room. **Ordinary** conditions are defined by a thermal range of 0.05 to 0.6 cal/cm²s, representing an air temperature range of 140 to 571°F. Under these conditions, protective clothing may allow sufficient time to extinguish the fire or to fight the fire until the nominal air supply is exhausted (usually less than 30 minutes).

Figure 30 - Range of Thermal Conditions Faced by Firefighters



- The **Emergency** region describes conditions in a severe and unusual exposure, such as those caused inside a "flash-over" room or next to a flame front. In **Emergency** conditions, the thermal load exceeds 0.6 cal/cm²s and temperatures exceed 571°F. In such conditions, the function of firefighters' clothing and equipment is simply to provide protection during the short time needed for an escape without serious injury.

Frederick Avenue - Significant Injury Investigation Report

The fireground event as described would have involved conditions that could be classified in ordinary range of exposure. Depending on the length of exposure, these conditions may produce no damage to the clothing and equipment. Given the fact that no damage was noted, particularly to the heat sensitive components of trim and hook/loop closure tape, it is unlikely that the clothing was subjected to any long term exposure of very high heat as would be experienced under emergency conditions. Clothing exposure was likely at the lower range of ordinary region. Nevertheless, there are patterns of charring on the interior side of the clothing that suggest some flame contact. Localized flame contact can produce significantly higher temperatures (over 1000°F) that are capable of causing burns to areas of lower insulation in very short contact times.

Heat transfer through protective clothing can also occur through conduction and the effects of stored energy. As clothing layers are compressed against the body, heat is more easily able to transfer into the body causing the earlier onset of burn injury. Similarly, heat absorbed by the clothing can be stored and then when the clothing contacts the body through compression (as may occur through falling on hot debris), burn injuries can occur. This transfer of heat can be increased if the clothing was wet. Clothing wetness from exterior hose spray or from interior sweating can increase heat transfer under certain heat exposure conditions.

Analysis and Findings

The principal damage to Firefighter [REDACTED] clothing appears at the lower edges of both the protective coat and pants. The location of this damage, characterized as mild charring, is evident on several layers and suggests that Firefighter [REDACTED] was exposed to direct flame that spread both to the exterior and interior of his clothing from below his body. The specific observations supporting this finding include:

- The lower trim bands on both coat and trousers are intact and show little evidence of melting. However, the lower hem of the shell along the front of the coat and thigh area of the pants shows some thermal damage.
- Thermal damage and the greatest fireground soiling to the shell is confined to the lower sleeve ends and lower front portions of the coat on either side of the front closure. For the pants, this damage appears on the upper front thighs (adjacent to the areas of the coat where damage was observed).
- Mild charring is noted on the less thermal stable moisture barrier side of the liner at the bottom hem of the coat and on portions of the coat interior. Similar damage is noted along the bottom pant cuffs and upper front thigh areas.

The description of the incident states that the firefighter fell into the basement within the room where the fire originated. He was then able to escape through a window in a relatively short period of time. It is likely that the process of falling through the collapsing floor that portions of the firefighter preheated clothing were compressed against his body from debris that traveled to the basement with him or hot burning objects already in the basement room. Moreover, in the process of escaping through a window, the firefighter would have could have been exposed to any flames that were coming from burning debris in the basement room.



Figure 1 – Firefighter [REDACTED] Protective Coat Exterior (Cut Open)



Figure 2 – Close-Up of Firefighter [REDACTED] Protective Coat Collar Area



Figure 3 – Close-Up of Firefighter [REDACTED] Protective Coat Left Sleeve Cuff



Figure 4 – Close-Up of Firefighter [REDACTED] Protective Coat Lower Right Sleeve



Figure 5 – Close-Up of Firefighter [REDACTED] Protective Coat Left Lower Front



Figure 6 – Close-Up of Firefighter [REDACTED] Protective Coat Right Lower Front

Frederick Avenue - Significant Injury Investigation Report



Figure 7 – Firefighter [REDACTED] Protective Coat Shell Interior (Cut Open)

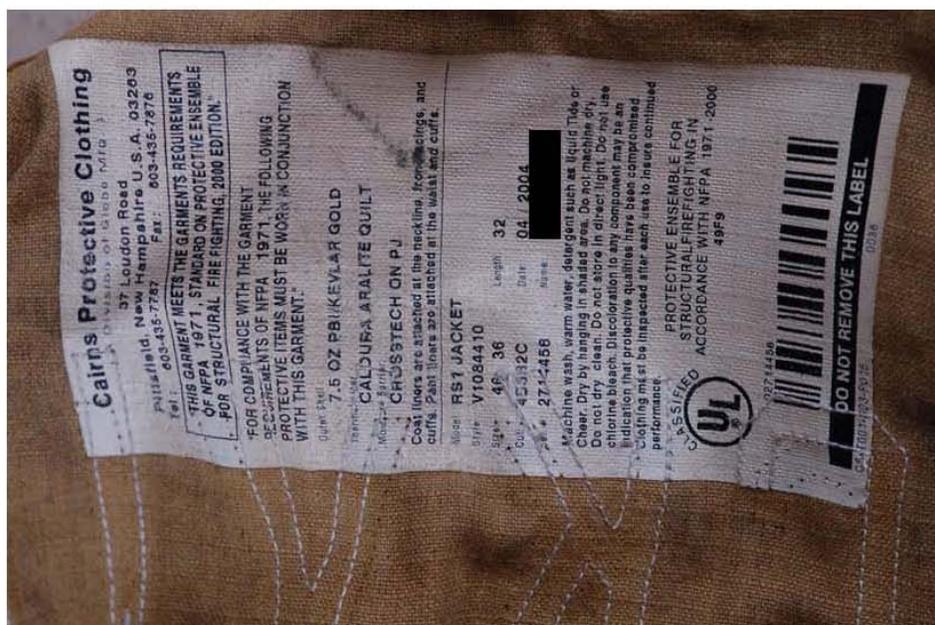


Figure 8 – Protective Label on Firefighter [REDACTED] Protective Coat Shell



Figure 9 – Firefighter [REDACTED] Protective Coat Liner – Moisture Barrier Side



Figure 10 – Close-Up of Moisture Barrier Soiling on Back of Firefighter [REDACTED] Protective Coat

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Figure 11 – Close-Up of Moisture Barrier Soiling on Low Left Hem Area of Firefighter [REDACTED] Protective Coat



Figure 12 – Firefighter [REDACTED] Protective Coat Liner – Thermal Barrier Side

Frederick Avenue - Significant Injury Investigation Report

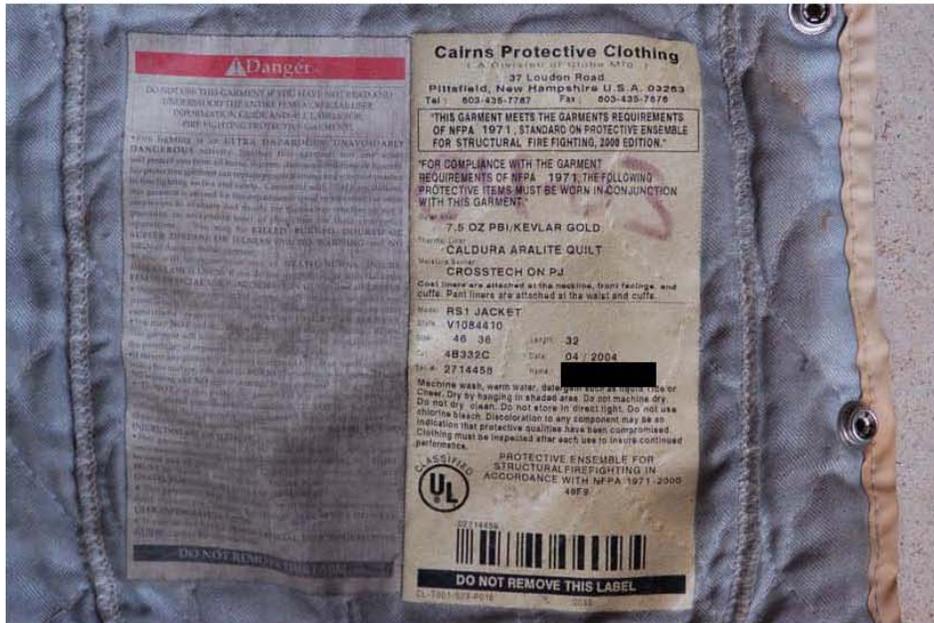


Figure 13 – Product Label on Firefighter [REDACTED] Protective Coat Liner Interior



Figure 14 – Firefighter [REDACTED] Protective Pants Shell Exterior (Front)

Frederick Avenue - Significant Injury Investigation Report



Figure 15 – Firefighter [REDACTED] Protective Pants Shell Exterior (Back)



Figure 16 – Close-Up of Firefighter [REDACTED] Protective Pants Back Lower Left Le



Figure 17 – Firefighter [REDACTED] Protective Pants Shell Interior (Front)



Figure 18 – Firefighter [REDACTED] Protective Pants Shell Interior (Back)



Figure 21 – Firefighter [REDACTED] Protective Pants Liner – Moisture Barrier Side (Back)



Figure 22 – Close-Up of Soiling/Damage on Firefighter [REDACTED] Protective Pants Moisture Barrier Front Thigh Area



Figure 23 – Close-Up of Firefighter [REDACTED] Protective Pants Moisture Barrier Back Lower Right Leg



Figure 24 – Close-Up of Firefighter [REDACTED] Protective Pants Moisture Barrier Back Lower Left Leg



Figure 26 – Firefighter [REDACTED] Protective Pants Liner – Thermal Barrier Side (Back)



Figure 25 – Firefighter [REDACTED] Protective Pants Liner – Thermal Barrier Side (Front)



Figure 27 – Close-Up of Tear in Fly Area of Firefighter [REDACTED] Protective Pants Liner



Figure 28 – Close-Up of Firefighter [REDACTED] Protective Pants Liner Cuff Area

Appendix 9 – SCBA Report

Excerpts from SCBA REPORT for Personal Injury or SCBA Performance Investigation

Fairfax County Fire and Rescue Department
SCBA Technical Services
6800-A Industrial Rd.
Springfield, VA. 22151
703-658-3660

ATTACHMENT EXPLAINING THE CONDITION OF MCFRS SCBA # 0392 AS IT WAS RECEIVED BY THE EVALUATORS.

Cylinder:

Cylinder received showing approximately **200 PSI** (EST) on the gauge.
Cylinder appears in good condition, minor smoke stains. Two new gouges in gel-coat through to the first layer of fiber wrap noted on the back side of cylinder three inches from cylinder neck.
Gauge cover broken.
Cylinder Bumper & Guard Assembly metal plate bent and rubber cut.

Reducer / Hoses:

Good condition, minor smoke stains.
No obvious defects.
All connections good but HUD hose found to be located 180 degrees out from where it should be in the anti-rotation hose clamp.
Red 08 sticker on side of reducer.

Regulator:

Appears in fair condition, air saver boot torn, Cover cracked on right side of cover at first support where the 1 is in E31/ is.
HUD display visor has cut in top of its left side.
Purge valve knob, lettering and arrow are not visible.
HUD hose shows signs of delaminating at couplings where bent.

Back frame / Straps:

Appears in fair condition.
Only damage appears to be to the back frame gasket not seating in frame at bottom of frame opening. All straps are in good shape; waist strap buckle has some rust on it but works ok.

Mask:

Appears in good condition.
Harness straps need replacing do to no elasticity left in straps.
Right pad buckle not holding in place, pad came off in cleaning; replaced with new one.
Deep scratch on left side of lens.
Other scratches from general use.

P.A.S.S. / Console: Both appear in good condition.

Frederick Avenue - Significant Injury Investigation Report

Pak-Alert, Console, gauge line connections appear good.
Console had some discoloration, still visible.

1	Date of Evaluation	10/10/2008				
2	Submitted by	FF Eugene W. Beach				
3	Primary Evaluators	1	Instrument Technician II Paul E. Carlin			
		2	Fire fighter Eugene W. Beach			
4	Date of Incident / Event	10/02/2008				
5	Incident Number / Address	101673	219 Frederick Ave Rockville, MD			
6	Brief Description of Incident / Event	The SCBA being evaluated is pack 0392 worn by RS703 Driver Montgomery County MD FR. Driver was injured after the floor collapsed while fighting a fire.				
7	Was the User "On Air" at the time of the incident?	Yes				
8	Equipment being Evaluated / Service & Testing History					
	Cylinder	Manufacturer:	Luxfer	Year:	Mar-00	
		Model / Type	4500 PSI Carbon Fiber			
		Serial Number:	OM 30014			
		Other ID:	Scott 10010826			
		Latest Hydrostatic test date:	Month	UKN	Year	2003
		Condition / appearance on scene or upon arrival at air shop:				
		Amount of air remaining in cylinder (PSI)	200 PSI (EST)			
		See attached report				
	Reducer / Hoses / HUD	Manufacturer:	SCOTT Health and Safety	Year:		
		Model / Type	Scott 4.5 Pressure Reducer			
		Serial Number:	RED0502008441AB			
		Other ID:	0392 stamped on reducer body			
		Last inspection / test / service	Month	On record	Year	2008
		Condition / appearance on scene or upon arrival at air shop:				
		See attached report				
	Regulator	Manufacturer:	SCOTT Health and Safety	Year:	On record	
		Model / Type	EZ Flow CBRN			
		Serial Number:	0392			
		Other ID:	0392 engraved on HUD bracket assembly			
		Last inspection / test / service	Month	On record	Year	On record
		Condition / appearance on scene or upon arrival at air shop:				
		See attached report				

Frederick Avenue - Significant Injury Investigation Report

	Back frame/straps	Manufacturer:	SCOTT Health and Safety	Year:	on record	
		Model / Type	Air-Pack 50			
		Serial Number:	0392			
		Other ID:	P/N 804415-11			
		Last inspection / service	Month	On record	Year	On Record
		Condition / appearance on scene or upon arrival at air shop:				
		See attached report				
	Mask	Manufacturer:	SCOTT Health and Safety	Year:		
		Model / Type	AV3000 size Medium w/ STD harness			
		Serial Number:	RJ2880			
		Other ID:	RJ2880 etched on upper bezel			
		Last inspection / service	Month	On record	Year	On record
		Condition / appearance on scene or upon arrival at air shop:				
		See attached report				
	P.A.S.S / Console	Manufacturer:	SCOTT Health and Safety			
		Model / Type	Pak-Alert SE, Integrated P.A.S.S.			
		PASS s/n	58280	Year	Oct-04	
		Other ID	105A0441			
		Last inspection / service	Month	On record	Year	On record
		Condition / appearance on scene or upon arrival at air shop:				
		See attached report				
Pre Test Evaluation						
12	Perform Daily Check on all equipment being evaluated / enter comments					
	Cylinder	PSI Reading	200 PSI (EST)			
		Any damage requiring repair prior to bench test				
	Evaluators initials	EWB				
	No repairs required. Cylinder turned on, no apparent leaks.					
	Reducer / Hoses / HUD	Any damage requiring repair prior to bench test				
		No repairs required. Connections appear good, no apparent leaks.				
Evaluators initials	EWB					
	Regulator	Any damage requiring repair prior to bench test				
		No repairs required. Vibralert, HUD, lights, purge all appeared to be in normal operating condition.				
Evaluators initials	EWB					
	Back frame / Straps	Any damage requiring repair prior to bench test				
		No repairs required.				
Evaluators initials	EWB					
	Mask	Any damage requiring repair prior to bench test				
		No repairs required. No problems noted.				
Evaluators initials	EWB					
	P.A.S.S / Console	Any damage requiring repair prior to bench test				

Frederick Avenue - Significant Injury Investigation Report

		No repairs required. Pak-Alert and console functioned properly, console gauge reading cylinder pressure in red, EST about 200 PSI.
	Evaluators initials	EWB
	Communications Equipment	Report any damage requiring repair
		No repairs required. No communications equipment with unit.
	Evaluators initials	EWB
	Other / Misc Equipment	Report any damage requiring repair
		N/A
	Evaluators initials	EWB
Pre Test SCBA: Test SCBA in condition it was received		
13	If any repairs were required for Pre-testing equipment on PosiChek, comment on the repairs and list parts used.	
	SCBA passed daily check, no repairs were required to perform pre test.	
14	Test SCBA on posi-chek /did all components pass / comment on results / attach test sheets	
	A number of tests were performed. The first test was the Mask test, using Mask RJ2880 with FXCO REG1436AB and RED9811174. The Mask passed all tests. See face piece test attached. The second was the Regulator test, using REG0392, FXCO Mask FRA L/M 25 and FXCO RED9811174. Regulator passed all tests. See Regulator test attached. The third test was the Functional test for reducer 0392 with FXCO REG5523AF and FXCO Mask FRA L/M 25. All Tests passed. See attached Reducer Test. The fourth test was with all parts Mask RJ2880, Regulator 0392, and Reducer 0392. All parts passed all tests. See attached Functional test results.	
Post Test Evaluation		
15	Disassemble reducer and regulator <u>AS NEEDED</u> to complete evaluation. At minimum, do a normal annual inspection, checking filters and replacing batteries. Note findings as equipment is disassembled, conditions of filters, gaskets, pistons, etc. Note any repairs to back frame or straps. Inspect and repair mask. If replacement parts are used, list parts replaced and KEEP USED PARTS!	
	Equipment	Comments
	Reducer / Console / Pak-alert	Reducer Primary and secondary checked. Found hole in primary filter cartridge. Replaced with new filter P/N 10005250. Found dirt in secondary filter cartridge. Replaced with new filter P/N 10005250
	Regulator	Regulator fully disassembled / cleaned up / reassembled by AG. See attached test for comments.
	Mask	Cleaned up by EWB found pad buckle missing, it came off in cleaning as it was just hanging on by the edge. Replaced Pad Buckle P/N 10011028. Both straps need replacing as they have no elasticity left in them. Not replaced. Deep long cut in face mask lens on left side. Did not replace. See attached test for comments.

Frederick Avenue - Significant Injury Investigation Report

	Back frame / Straps /Other Miscellaneous	Batteries tested all tested good. Back frame gasket needs to be re-glued at the bottom of the opening.
--	---	--

Frederick Avenue - Significant Injury Investigation Report

16	Cleaning Process: Note what cleaning was done if any.	Major cleaning required. The whole unit was cleaned, re-inspected and tested to ensure all repairs were effective.
Post Testing: Test SCBA after inspection and repairs completed.		
17	Test SCBA on posi-chek /did all components pass / comment on results / attach test sheets	
	All post testing of SCBA components passed. All parts were tested as a unit.	
18	Is any of the equipment being evaluated unable to be returned to service?	No
	List the equipment unable to return to service and reason All equipment that was evaluated is functional	
19	Cost to replace equipment if not repairable	N/A
20	Cost of any repairs that were made to equipment	Parts replaced: 2-reducer filters P/N 10005250. 1 Cylinder gauge cover cracked and replaced P/N 36750-01. 1 Cylinder Bumper & Guard Assen were bent and replaced P/N 804113-01. 1 Pad Buckle was replaced P/N 10011028.
21	Evaluators Comments or notes	
	Nothing remarkable concerning the condition of SCBA 0392. As stated previously, there was no evidence any of the equipment evaluated was exposed to extreme conditions. Scuff marks on bottom of cylinder indicate SCBA was damaged from drop or fall. All equipment had some debris when received cylinder reducer, regulator and mask cleaned up prior to returning.	

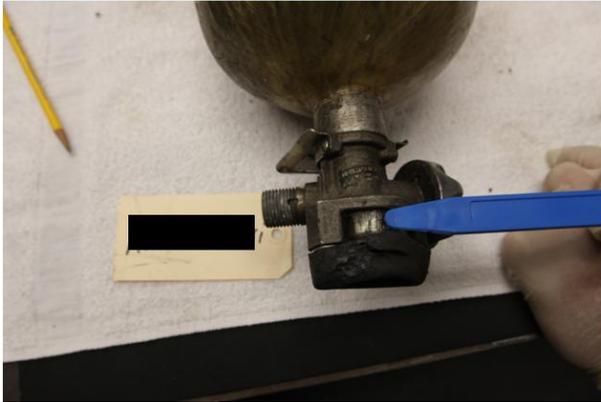
Frederick Avenue - Significant Injury Investigation Report

ATTACHMENT EXPLAINING THE CONDITION OF [NAME REDACTED] EQUIPMENT AS IT WAS RECEIVED BY THE EVALUATORS.

Cylinder:

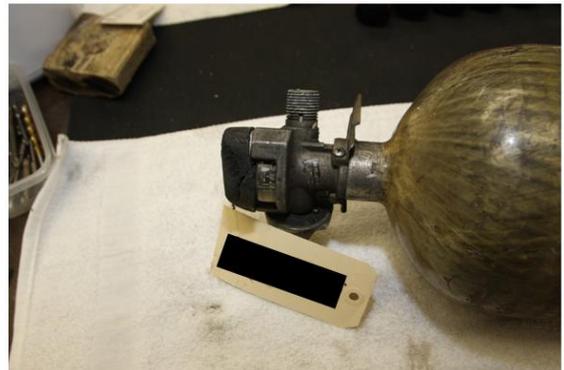
Cylinder received showing approximately 200 PSI on the gauge.

Cylinder appears in good condition, minor smoke stains.



Two gouges in gel-coat through to the first layer of fiber wrap noted on back side of cylinder three inches from cylinder neck

Gauge cover broken and cylinder bumper & guard assembly bent



Frederick Avenue - Significant Injury Investigation Report

Reducer / Hoses:

Good condition, minor smoke stains

HUD hose found 180 degrees out from where it should be in the anti-rotation hose clamp



Red 08 sticker on side of reducer



Frederick Avenue - Significant Injury Investigation Report

Regulator:

Appears in fair condition, air saver boot torn, cover cracked on right side

HUD display visor has cut in top of its left side.



View of Regulator

HUD hose shows signs of delaminating at coupling where bent.



Frederick Avenue - Significant Injury Investigation Report

Back frame / Straps:

Appears in fair condition

Only damage appears to be to the back frame gasket not seating in frame at bottom of frame opening. All straps are in good shape; waist strap buckle has some rust on it but works ok.



Mask:

Appears in good condition

Deep scratch on left side of lens. Other scratches from general use.



Frederick Avenue - Significant Injury Investigation Report

P.A.S.S. / Console:

Both appear in good condition. Pak-Alert, Console, Console had some discoloration, still visible. gauge line connections appear good.



Frederick Avenue - Significant Injury Investigation Report

Appendix 10 - ER 21-06AM

CERTIFICATION STANDARDS FOR TRAINING, EXPERIENCE, AND CREDENTIALING REQUIREMENTS APP. A-1

<p><u>Candidate</u> Volunteer Membership</p>	<p><u>Recruit</u> * Station Orientation * Air/Blood-borne Pathogens * CPR-Health Care Provider * AED * Haz Mat Operations * Human Relations & EEO * SCBA/PPE * Voice radio/Mobile data computer/unit-incident reporting system</p>	<p><u>FF I</u> Essentials of F/F I or *EMT-B, AED, and CPR (must obtain within 2 years of implementation) No experience required</p>	<p><u>FF II</u> Essentials of FF I and * EMT-B, AED, and CPR Training meets or exceeds NFPA Std. 1001 (2002) or current edition. Once certified must maintain Maryland EMT certification.</p>
<p><u>FF III</u> * EMT-B, CPR, and AED Technical Rescue Course Strategy & Tactics Course (Annual Competency Evaluation, if operating in officer position) <u>Experience</u> – 3 years total, at least 2 yrs at FF/R II. Up to 1 yr at FF/R I may count toward total experience requirements.</p>	<p><u>MFF</u> * EMT-B, CPR, and AED Pumps Aerial Operations Annual Competency Evaluation <u>Experience</u> – 3 yrs total, at least 2 yrs at FF/R II, 1 year FF III MFF/R is an optional rank</p>	<p><u>LT</u> * EMT-B, CPR, and AED Pumps Aerial Operations Fire Officer I Instructor I WMD Operations-Level First Responder, subject to availability of federal funds Annual Competency Evaluation and Peer Evaluation <u>Experience</u> – 2 yrs at FF/R II, and 1 yr at FF/R III or MFF/R</p>	<p><u>Captain</u> * EMT-B, CPR, and AED WMD Operations-Level First Responder, subject to availability of federal funds Annual Competency Evaluation and Peer Evaluation <u>Experience</u> – 2 yrs at FF/R II, and 1 yr at FF/R III or MFF/R and 2 yrs at LT</p>
<p><u>Certified Chief Officer</u> *EMT-B, CPR, and AED Annual Competency Evaluation and Peer Evaluation Must comply with COPDI requirements <u>Experience</u> – 2 yrs at FF/R II, and 1 yr at FF/R III or MFF/R and 2 yrs at Lt and 2 yrs at Captain</p>	<p><u>LFRD Chief/Ass't Chief</u> *EMT-B, CPR, and AED Annual Competency Evaluation and Peer Evaluation Must comply with COPDI requirements <u>Experience</u> – 2 yrs at FF/R II, and 1 yr at FF/R III or MFF/R and 2 yrs at Lt. and 2 yrs at Captain and 2 yrs at Certified Chief Officer</p>	<p><u>Duty Operations Chief</u> *EMT-B, CPR, and AED Successful completion of promotion process and selection by the Fire Chief Annual Competency Evaluation and Peer Evaluation Must comply with COPDI requirements <u>Experience</u> – 2 yrs at FF/R II, and 1 yr at FF/R III or MFF/R and 2 yrs at Lt and 2 yrs at Captain and 2 yrs at Certified Chief Officer</p>	

* BASIC CORE TRAINING REQUIREMENTS 8-07