

BALTIMORE COUNTY FIRE DEPARTMENT

LINE OF DUTY DEATH INVESTIGATION REPORT



FIREFIGHTER MARK FALKENHAN

30 DOWLING CIRCLE
HILLENDALE, MARYLAND

JANUARY 19, 2011

REPORT COMPLETED: MARCH 16, 2012

Table of Contents

<u>Section</u>	<u>Page</u>
Letter from the Fire Chief	1
Executive Summary	2
Biography of FF Mark Falkenhan.....	5
Acknowledgements	6
Overview of Baltimore County and the Department.....	8
Methodology	13
Incident Summary	16
Incident Information	
Dispatch Information.....	26
Staffing	27
Weather.....	28
Building Construction	29
Origin and Cause Investigation	33
Fire Progression Sequence Overview	34
Fireground Operation Sequence	
Chronology of Significant Events	36
Timeline.....	41

Findings, Discussion, Recommendations

Crew Integrity.....	42
MAYDAY/RIT.....	44
Incident Command	52
Strategy/Tactics	65
Communications.....	75
Training	80
Appendices.....	81



KEVIN KAMENETZ
County Executive

JOHN J. HOHMAN, CHIEF
Fire Department

The sudden loss of Mark G. Falkenhan shook the Baltimore County fire service at its core. His death resonates with every career and volunteer member, on each and every call. It reminds us that life is precious and fragile, and that this job, despite our best efforts in safe work practices, is still dangerous and requires risk assessment with every response and every decision made.

As I read the report submitted by our Line of Duty Death investigation team, I was proud of their work product, yet unsettled by the reality that there was not a major cause or failure that resulted in his death. The tradition of the fire service is to find the problem and either fix it or prevent it in the future. This rule cannot be applied in this case since the outcome was the result of minor issues that alone, are recoverable...but stacked up, were catastrophic. The report leads me to conclude that while there is always room for improvement, there was no single cause, no single reason for this death. This was by no means a routine incident--but let us not forget that here is a clear cut case of engaging in high risk but achieving high reward. His death overshadowed the fact that three people were rescued by the heroic efforts of the crews ...and that is exactly what Mark was doing. He knew people were trapped, he knew the fire was still burning, yet he entered the building relying on his training, equipment, and courage, to join the effort.

I believe that every person who ascends to the position of fire chief makes their top priority the prevention of a line of duty death or serious injury. I know this to be true from my experiences interacting with other chiefs at meetings, conferences, training seminars and from reading other line of duty injury and death studies. I took this position believing that I could help ensure such a tragedy would never occur in Baltimore County. The events of January 19, 2011 serve as a reminder that despite the best intentions, up to date apparatus and equipment, increased training, response, and teamwork, these tragedies can and do occur. As Mark dedicated much of his life to training, we too should commit to training at every opportunity possible.

Perhaps the most difficult part of this is that Mark was known and loved by so many. He was a model employee who left for another calling yet continued to serve his community. I am deeply touched by his character and his reputation for excellence. And above all, he was a devoted family man from a legacy of fire service devotion.

Lastly, I am moved by the response of his wife, Gladys, and their two sons Christian and Garrett. They handled this tragedy with poise, dignity, and strength and in doing so, are already carrying on the tradition of Mark's character. I truly believe Mark did not die in vain. He was doing what he loved and made the ultimate sacrifice in trying to save the lives of others.

Let me close by thanking the investigating committee for their tireless effort and devotion to finding the facts and generating recommendations. Their path was paved with volumes of data, reports, and interviews in an emotionally charged environment. Their contribution is commendable and the final report is the roadmap for guiding the department through this most difficult time.

John J. Hohman
Fire Chief

Executive Summary

On Wednesday, January 19, 2011, a fire occurred in an apartment building located in the Hillendale section of Baltimore County, Maryland. This fire resulted in the line of duty death (LODD) of volunteer firefighter Mark G. Falkenhan, who was operating as the acting lieutenant on Squad 303 (for purposes of this report, Mark will be referred to as FF Falkenhan). Upon their arrival, FF Falkenhan and a second firefighter (FF # 2) from Squad 303 deployed to the upper floors of the apartment building to conduct search and rescue operations. Other fire department units were already involved with both firefighting operations and effecting rescues of trapped civilians. During these operations, FF Falkenhan and FF # 2 became trapped in a third floor apartment by rapidly spreading fire and smoke conditions. FF # 2 was able to self-egress the building by diving headfirst down a ladder on the front (address side) of the building. FF Falkenhan declared a "MAYDAY" and implemented "MAYDAY" procedures, but was unable to escape or be rescued. FF Falkenhan was located and removed via a balcony on the third floor in the rear of the building. Resuscitative efforts began immediately upon removal from the balcony, and continued en route to the hospital. FF Falkenhan succumbed to his injuries and was pronounced deceased at the hospital.

Baltimore County Fire Department Standard Operating Procedures, Personnel #16, requires a team to be formed, a detailed investigation to be conducted and a report produced for any incident involving a line of duty life threatening injury or death. The team's objective is to thoroughly analyze and document all the events leading to the injury or death and to make recommendations aimed at preventing similar occurrences in the future. At a minimum, a Division Chief, the Department's Health and Safety Officer, a member

from the Fire Investigation Division, an IAFF Local 1311 union representative, and the Baltimore County Volunteer Firemen's Association Vice President of Operations (when a volunteer member is involved) is required (see Acknowledgements section for actual team make-up).

The investigating team examined any and all data available, including independent analysis of the self contained breathing apparatus (SCBA), turnout gear and autopsy report. The Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) produced a fire model to assist with evaluating fire behavior. Multiple site inspections were conducted. Extensive interviews were conducted by the team which also attended those conducted by investigators from the National Institute for Occupational Safety and Health (NIOSH). Photographic and audio transcripts were also thoroughly analyzed. A comprehensive timeline of events was developed. All information used to make decisions regarding recommendations was corroborated by at least two sources.

In fairness to those units involved in this incident, the investigating team had the advantage of examining this incident over the period of several months. Furthermore, given the size and nature of the event, and the fact that arriving crews were met with serious fire conditions and several residents trapped and in immediate danger, all personnel should be commended for their efforts for performing several rescues which prevented an even greater tragedy. The team did not identify a particular primary reason for FF Falkenhan's death. What were identified were many secondary issues involving but not limited to crew integrity, incident command, strategy and tactics, and communications. These issues are identified and discussed, and recommendations are made in appropriate sections of the report, as well as in a consolidated format in the Appendix.

Some of the issues identified in this report may require some type of change to current practices, policies, procedures or equipment. Most, however, do not. Specifically, the analysis and recommendations regarding Incident Command and Strategy and Tactics show that if current policies and procedures are adhered to, the opportunity for catastrophic problems may be reduced.

Mark Falkenhan was a well-respected and experienced firefighter. He died performing his duties during a very complex incident with severe fire conditions and unique fire behavior coupled with the immediate need to perform multiple rescues of victims in imminent danger. It would be easy if one particular failure of the system could be identified as the cause of this tragedy. We could fix it and move on. Unfortunately it is not that simple. No incident is “routine”. Mark’s death and this report reinforce that fact.

Biography

Firefighter Paramedic Mark G. Falkenhan



Mark Gray Falkenhan had dedicated his life to serving others. He perished in the line of duty on January 19, 2011 while performing search and rescue operations at a multi-alarm apartment fire in Hillendale, Baltimore County. He was 43 years old.

Mark was born on December 26, 1967 in Middle River, MD. Shortly after graduating from Mount Carmel High School, Mark joined the Middle River Volunteer Ambulance and Rescue Company where he served as Chief and had become a life member. His inspiration for firefighting came from watching the television show “Emergency” as a child and Mark fulfilled one of many dreams when he became a career Emergency Medical Technician with the Baltimore County Fire Department in 1990. Several years later, Mark married Gladys and they became the parents of two wonderful sons. Shortly after his marriage, Mark was promoted to Paramedic. Mark served at several stations in the eastern portion of the county before retiring in 2006 to accept a position as an emergency services instructor with the United States Secret Service. This was a difficult decision for Mark to make but he realized that his talents as an instructor and mentor could be put to better use training others to safely perform their duties. Mark carried his love of the fire service to the Lutherville Volunteer Fire Company in 2009 with whom he was serving when he answered his final alarm.

Mark was the consummate professional. He was dedicated to everything that he did, most importantly to his wife and sons. Family was Mark’s first passion and he enjoyed spending time watching his sons play soccer and lacrosse. Mark was totally committed to serving his brothers and sisters in the emergency services and was liked by everyone he met. His broad smile and determined nature made him a great asset to the profession. He will always remain a hero to all he came into contact with, and his sacrifice will never be forgotten.

Acknowledgements

The Baltimore County Fire Department wishes to thank the following individuals for all of their effort and dedication through the difficult process of examining the circumstances involved in Firefighter Mark Falkenhan's line of duty death. FF Falkenhan was the first Baltimore County firefighter killed in a fire since 1983. By sharing this report it is the Department's goal to educate all responders and to initiate discussion that will further enhance efficient fireground operations.

Investigation Team Members

Division Chief Jonathan Kuruc, Team Chairperson
Fire Director Peter Hill, Staffing Office
Fire Director Joseph Brown, Office of Health and Safety
Battalion Chief Paul Lurz, Emergency Operations
Fire Captain Chris Gauss, Fire Investigation Division
Fire Captain Thomas Ramey, Baltimore County Professional Fire Fighters Association, Local 1311 Representative
Fire Captain Albert Long, Emergency Operations
Kenneth Bollinger, Vice President of Operations, Baltimore County Volunteer Firemen's Association

The team would also like to recognize the following individuals for their support, efforts, and contributions to the Baltimore County Fire Department and the family and friends of FF Mark Falkenhan:

Baltimore County Government-County Executive Kevin Kamenetz and his staff
Baltimore County Fire Department Chief John Hohman and his staff

Prince William County (VA) Department of Fire and Rescue, Battalion Chief
Jennie L. Collins

Baltimore County Professional Fire Fighters Association, Local 1311

Baltimore County Volunteer Firemen's Association

Baltimore County Police Department, Chief Jim Johnson

Special Acknowledgements

Baltimore County Fire Department

- To all the Department personnel from both the career and volunteer services who assisted the team with valuable information through interviews and photographs

- Fire Director Richard Petry, Lt. Phillip Hebert, and Nick Stachurski, Senior Staff Engineer for Motorola Solutions for their insight and knowledge of the working principles of Baltimore County 800 MHz radio system.

Baltimore County Police Department

- Crime Lab for audio scrubbing and photo enhancement
- Arson Unit

U.S. Bureau of Alcohol, Tobacco, Firearms, and Explosives

- Adam D. St. John, Fire Protection Engineer and his staff, Baltimore Group I Arson and Explosives, Fire Research Laboratory

National Institute for Occupational Safety and Health

- Murrey E. Loflin, MS
- Timothy R. Merinar, MS CFEI
- Jay L. Tarley
- Stephen Miles

National Personal Protective Technology Laboratory

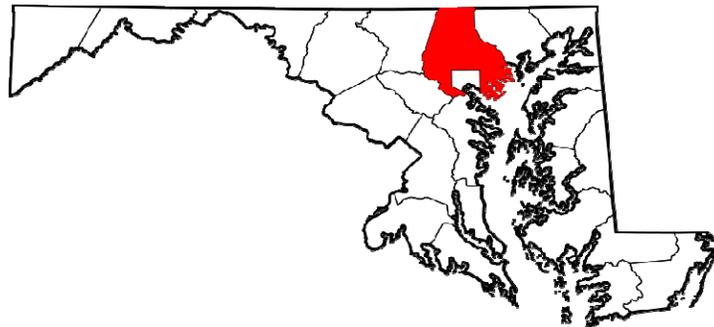
- Thomas D. Pouchot, General Engineer

Maryland Office of the Chief Medical Examiner

Baltimore County, Maryland



Baltimore County is a rapidly expanding urban, suburban and rural community located in central Maryland. The county wraps around Baltimore City in nearly all directions except due south and extends from the Chesapeake Bay in the southeast to Pennsylvania in the north. With a population of over 800,000, it is larger than Baltimore City. Baltimore County is also the third largest county in the state of Maryland with over 612 square miles of land, 28 square miles of water, and over 100 miles of waterfront. Baltimore County has no incorporated municipalities located entirely within its boundaries. The County contains many [unincorporated communities](#) which are listed in many collections of towns.

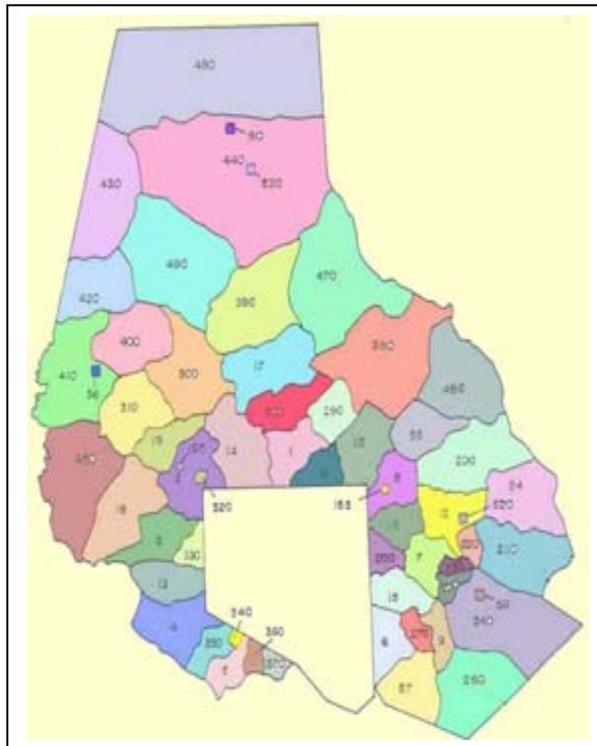


Baltimore County Fire Department



The Baltimore County Fire Department includes more than 1,000 paid emergency response personnel, housed at 25 [career stations](#). These career responders work at fire and rescue scenes alongside volunteer responders from the county's 33 [volunteer fire stations](#). More than 2,000 citizens volunteer in the fire service as active responders, fundraisers and support personnel. Though each volunteer company is an independent, non-profit corporation, Baltimore County has a true joint fire service, with dedicated career and volunteer responders working together at emergency scenes every day on behalf of our citizens. The

County is broadly divided into three geographical areas, which are known as battalions. Each battalion has four shifts at each fire station rotating to provide 24 hour staffing. Each shift county-wide is managed by a Division Fire Chief. Baltimore County also provides mutual aid response to Baltimore City and the adjoining Howard, Carroll, Harford, and Anne Arundel counties. Baltimore County Firefighters, Paramedics and Emergency Medical Technicians respond to approximately 117,000 incidents annually. In 2011, more than 77 percent of the incidents involved EMS work.



Apparatus available to serve county citizens include:

- 88 engines (27 career and 61 volunteer)
- 13 trucks (7 career, 6 volunteer)
- 46 medic units (29 career, 17 volunteer)
- 3 tower ladders

- A state-of-the-art, urban search-and-rescue unit
- A decontamination unit
- Six large-capacity tankers for rural firefighting
- Brush units
- 9 volunteer heavy-rescue squads

At various times, additional advanced or basic life support units are staffed.

Special Operations

An Advanced Tactical Rescue (ATR) team, housed at Texas Fire Station #17, is specially trained for unusually difficult, complex rescues, such as building collapses, water rescues, trench rescues and high-rise rescues. Several department members serving on a Federal Emergency Management Agency Urban Search and Rescue Team (FEMA, USAR) were dispatched to New York by the federal government on Sept. 11, 2001 to assist with rescue and recovery following the terrorist attacks.

In 2007, the County purchased a state-of-the-art urban search-and-rescue vehicle, equipped to handle building collapses, water rescues, trench rescues and other tactical emergencies. The unit was purchased with federal homeland security funds and is available for deployment throughout the region.

Besides the ATR team, the County has swift-water teams at two volunteer companies, Kingsville and Arbutus. The Middle River Volunteer Ambulance and Rescue Company has a Dive Rescue Team, and the Bowleys Quarters Volunteer Fire Dept. has a Marine Emergency Team used for open water rescues on the Chesapeake Bay, lakes and reservoirs.

The Department operates one hazardous materials unit, stationed centrally at Brooklandville Fire Station #14, and two Hazmat satellite units.

Two volunteer rehab units provide invaluable support by supplying food and drink and other services to firefighters and emergency medical personnel at the scenes of fires and various emergencies. Volunteer members of Box 234 Association, Inc. (Company 156), and the Central Alarmers (Company 155), make themselves available at any hour of the day or night. The rehab units also routinely provide support at Fire Department events such as dedications, ceremonies, and press conferences.

Emergency Medical Services

In 2011, 77 percent of the incidents involved EMS work. Medic units are housed in fire stations alongside fire apparatus, and many career and volunteer personnel are trained in both EMS and fire suppression. The department operates 46 advanced life support medic units, 29 career and 17 volunteer.

Residents of Baltimore County enjoy a state-of-the-art emergency medical and trauma care system. This system features:

- Advanced life support engine companies
- Emergency Medical Technicians and Paramedics on all medic units
- Maryland State Police Medevac helicopters
- The world-renowned Shock Trauma Center at University of Maryland Hospital

Support Services

The Baltimore County Fire Department supports its emergency operations with an extensive network of services including:

- Fire code enforcement
- Community safety education

- Public information services
- Breathing apparatus maintenance
- Information technology
- Fire dispatch
- Recruitment
- Supply/equipment maintenance

Methodology

A LODD Investigative Team was formed per Personnel 16, Line of Duty Death/Life Threatening Injury and Funeral Policy, of the Baltimore County Fire Department Standard Operating Procedures.

- Chaired by a Division Chief of Emergency Operations
- Comprised of representatives from management, Fire Investigation Division (FID), Emergency Operations Division, Safety Office, IAFF Local 1311, and Baltimore County Volunteer Firemen's Association.

Information Collected

Interviews

- First round of interviews the night of the incident were completed by FID.
- Oral interviews (later transcribed by the ATF) and transcribed interviews by FID
 - Companies directly involved with initial operations
 - Companies in support roles who offered outside perspectives
 - **All information is corroborated by two separate sources**

Photographs

- Timed stamped photographs (side Alpha), with 1 hour adjustment due to daylight savings time
- Side Charlie neighborhood canvassed to acquire additional photographic and video evidence
 - Received video and photos, including cell phone video

Maps

- Cartographic depictions of area including building and surrounding structures
- Google overhead maps and Baltimore County Fire Department Box Area maps

Communication

- Audio of Main 1, Divisional talk group, main tactical and secondary tactical talk group (Main tactical talk group “scrubbed” by Baltimore County Police Department to enhance the audio quality).
 - Subscriber Identification Module (SIMS)- The record was overwritten within 24 hours, per the practice at that time.

Timeline

- Measured in increments of 1 second
- Aligned/meshed to changes in fire behavior, critical events, and photographic/video evidence of investigation

Weather

- Weather reports were analyzed of January 19, 2011

Site Inspections

- Multiple site inspections by FID, ATF, LODDIT, and NIOSH
- Inspections of neighboring units of same type apartment
- Anecdotal testing of doors of fire building and neighboring buildings of similar type

Fire Modeling

- Multiple fire modeling trials were done by ATF to ensure accuracy of fire behavior

Autopsy

- Completed by the Medical Examiner's Office in Baltimore--preliminary and final reports received

SCBA

- Independent testing done by NIOSH at the National Personal Protective Technology Laboratory, Technology Evaluation Branch located in Bruceton, PA by Thomas D. Pouchot, General Engineer

Incident Summary

On Wednesday, January 19, 2011 at 1816 hours, a call was received at the Baltimore County 911 Center from a female occupant at 30 Dowling Circle in the Hillendale section of Baltimore County. The caller stated that her stove was on fire and the fire was spreading to the surrounding cabinets. Fire box 11-09 was dispatched by Baltimore County Fire Dispatch (Dispatch) at 1818 hours consisting of four engine companies, two truck companies, a floodlight unit, and a battalion chief. All units responded on Talkgroup 1-2.

The location, approximately one mile from the first dispatched engine company, is a three story garden-type apartment complex, with brick construction and a composite shingle, truss supported roof. The fire building contained a total of six apartments divided by a common enclosed stairway in the center with one apartment on the left and one to the right of the stairs. For reference purposes, the apartments will be identified as such, with the door markings used by the apartment complex:

<u>Floor</u>	<u>Left apt. #</u>	<u>Right apt. #</u>	<u>Notes</u>
Third	B-1	B-2	Top level
Second	A-1	A-2	Middle level
First	T-1	T-2	Terrace level, partially below grade

Alpha, Bravo, Charlie, and Delta will be used to designate the clockwise geographic locations of the structure, beginning with Alpha on the address side of

the building (see Appendix L). Entry is gained through the front split-level stairwell by a common entrance door with individual doors leading to each apartment. Each apartment consists of two bedrooms, a kitchen, bathroom, and a living/dining area. There are sliding doors leading to either a wood joist deck/balcony on the second and third floor apartments, or a concrete patio on the first floor apartments. Utilities consist of gas service to the furnace and hot water heaters located in a utility closet in each apartment, with electric service to the remainder of the appliances, including the stove. Interior walls of the apartments are drywall over wood stud construction. Floor coverings consist of carpeting over tile and concrete on the terrace/first floor. The second and third floor coverings consist of carpeting covering hardwood floors with a plywood subfloor. Interior doors are hollow wood construction. The door to the common hallway is of solid wood construction. The sliding doors to the deck/patio area are glass.

The first arriving engine, E-11, was staffed with a Captain, Lieutenant, Driver/Operator, and a Firefighter. Upon arrival at 1820 hours, the Captain gave a brief initial report describing a three story garden apartment with smoke showing from side Alpha: “The Captain of E-11 will have Command and we are initiating an aggressive interior attack with a 1 ¾” hand line”. Command also instructed the 2nd due engine to bring him a supply line from the hydrant.

A female resident (victim # 1) appeared in a third floor apartment window, Alpha/Bravo side (Apt. B-1), yelled for assistance, and threatened to jump. No

smoke or fire was visible from any of the third floor windows. At 1823 hours, Command advised Dispatch that he had a rescue and that he was establishing Limited Command. Fire Dispatch was in the process of upgrading the response profile to an apartment fire with rescue when the responding Battalion Chief requested that the fire box be upgraded to a fire rescue box. While the Firefighter and Lieutenant prepared for entry into the building, the Captain and Driver/Operator extended a ladder to the 3rd floor apartment window and rescued the resident. The first attempt by the Firefighter and Lieutenant to make entry into the side Alpha entrance was unsuccessful due to the extreme heat and smoke conditions.

The second due engine, E-10, arrived at 1823 with staffing of a Captain, Lieutenant, Driver/Operator, and a Firefighter. At 1823, E-10's crew brought a 4" supply line to E-11 from the hydrant at Deanwood Rd. and Dowling Circle and assisted the first-in crew with fire attack. The Captain from E-10 conferred with Command and was instructed to advance a second 1 3/4" hand line. The window to the first floor right apartment (Apt. T-2) was removed, and the second 1 3/4" line was advanced to the building by the crew of E-10. Fire attack was initiated through the removed window. At 1827, Command requested a second alarm.

At this time, heat and smoke conditions just inside the front door improved enough to allow the Firefighter and Lieutenant from E-11 to make entry through the front door and into the stairwell. There they encountered heavy, thick black

smoke and high heat conditions coming up the stairs from the terrace level apartment. The Lieutenant reported that the doorway to the first floor apartment was orange with fire and he had to fight his way through heavy heat and smoke conditions to attack the fire in the first floor right apartment (Apt. T-2). Entry was made approximately 3 feet into the doorway when the Firefighter's low air alarm began to sound, and he exited the building. A member from E-10's crew replaced the Firefighter from E-11 on the hose line.

At the same time, the Captain from E-11 proceeded to the rear of the structure to complete his initial 360 degree size up. He noted that there was fire emanating from the open sliding doors on the first floor Charlie/Delta apartment (Apt. T-2), extending to the balcony above. E-1, staffed by a Captain, Driver/Operator, and two Firefighters arrived and completed the hookup of the supply line that had been laid to the hydrant by E-10. The rest of Engine 1's crew grabbed tools and an extension ladder and reported to the Charlie side of the building. Command then ordered the 2nd due truck (T-8) and the 3rd due engine (E-292) to report to the alley behind the fire building at 1834. T-8 is a tiller unit staffed by a Lieutenant, two Driver/Operators and a Firefighter. Engine 292, staffed with an Officer, Driver/Operator, and one Firefighter, was directed to assume Command of Charlie.

Command returned to side Charlie to re-evaluate conditions, and instructed the crew from E-292 to make an interior attack.

Personnel stated that at this point fire conditions seemed to improve, suggesting that crews were making progress extinguishing the fire. (The first arriving attack crew reported that they were able to see apparatus lights through the sliding doors on Charlie side, which indicated to them that smoke and fire conditions were improving.)

Truck 1, a tiller unit staffed by a Lieutenant, two Driver/Operators, and a Firefighter, arrived on side Alpha and immediately began search and rescue operations. Windows on the second floor Alpha/Delta side apartment (Apt. A-2) were vented and ladders were thrown to gain access. T-8 arrived at the alley on side Charlie. E-1 extended a ground ladder to the third floor balcony on the Charlie/Bravo side of the structure (Apt. B-1), and made access to the apartment to search for additional victims. They noted fire venting from the first floor Charlie/Delta apartment (Apt. T-2) out of the sliding glass doors progressing upwards towards the balcony on the second floor. Upon entering the apartment, they conducted a primary search and noted minimal heat with light smoke conditions. The crew accessed the hallway via the apartment entry door and noticed an increase in the temperature and the amount of smoke. They immediately closed the door and exited the apartment via the ground ladder. Upon exiting the apartment, E-1's crew observed E-292 on the scene with a hand line extending into the apartment of origin, (first floor, Charlie/Delta side, Apt. T-2). The officer on E-1 noted white smoke coming from the unit.

Having already laid a supply line from the intersection of the alley and Deanwood Road, E-292's crew extended a 1 ¾" hand line into the apartment of origin. Moderate fire conditions with zero visibility were encountered, and they reported feeling a great deal of heat on their knees as they crawled through the apartment.

The Lieutenant and the Firefighter from Truck-1 entered Apartment A-2 via a second floor bedroom window (Alpha/Delta side) and began a search for additional victims. As they traversed the living room area they found an unconscious male resident (victim #2). At 1836 hours, the Lieutenant notified Command via an urgent transmission that a victim had been located and they needed assistance with evacuation. The Lieutenant and Firefighter noted a small fire in the rear corner near the victim as they exited the room. The crew returned to the bedroom from which they had entered and closed the door behind them. Victim #2 was then evacuated from the apartment via a ground ladder through the bedroom window, and transferred to EMS personnel on side Alpha.

At 1831 hours, Squad 303, a unit staffed by a Driver/Operator, Firefighter Falkenhan (acting Officer in Charge), and 3 other Firefighters had arrived at the Alpha side of the building. Firefighter Falkenhan and two crew members grabbed their tools and immediately entered the building. One Firefighter (Firefighter #1) proceeded to the terrace floor apartment to assist crews with fire attack. Firefighter Falkenhan and the other Firefighter (Firefighter #2) proceeded to the second floor

Bravo side apartment (Apt. A-1) to search for additional victims. They forced the door to the second floor apartment and conducted their search. Finding no one, they reported to Command that they had encountered high heat in the apartment and at 1838 hours, inquired as to which apartment victim #2 had been found. Firefighter Falkenhan advised Command that he and his fellow Firefighter were proceeding to the third floor to continue their search.

At 1840 hours, Battalion Chief 11 (BC-11) arrived on the scene, performed a face-to-face pass on with the Captain on Engine 11, and assumed Command. BC-11 initially observed limited smoke conditions, indicating to him that crews had made progress in extinguishing the fire.

Meanwhile, the Lieutenant and Firefighter from T-8 entered the second floor apartment that S-303 had just searched (Apt. A-1, second floor, Bravo side). They proceeded through the apartment and went across the hallway to Apartment A-2 where Truck-1 had just made their rescue (second floor, Delta side). The Lieutenant noted smoky conditions, and saw that the sliding doors to the rear of the apartment were open, and saw a small fire in the rear of the apartment to the left of the open doors. On their way back to their point of entry, T-8's crew discovered an unconscious female victim (victim #3). At 1837 hours, T-8 attempted to reach Command via radio and was covered by inaudible radio traffic. Dispatch was able to receive the radio transmission from T-8, and advised Command that another victim had been located on the second floor.

At this point, the crew from S-303 had completed their search of the third floor Bravo side apartment (Apt. B-1). Firefighter Falkenhan and Firefighter #2 were able to look out of the sliding doors on side Charlie down to the first floor apartment, Apt. T-2 (Charlie/Delta side) and could see fire. Smoke conditions on the third floor were light enough to walk upright in a somewhat crouched position. The crew returned to the hallway, forced open the door to the third floor Charlie/Delta side apartment, Apt. B-2, and made entry. Firefighter #2 walked down the hallway to the bedroom on the right while Firefighter Falkenhan searched to the left. After checking the bedroom, Firefighter #2 stated that he heard something behind him and turned to see fire in the hallway.

As the crew from S-303 searched the third floor Delta side apartment (Apt. B-2), The Lieutenant and Firefighter from T-8 were attempting to remove victim #3 from the second floor Delta side apartment (Apt. A-2). As they prepared to move their patient, fire conditions changed suddenly. The Lieutenant from T-8 observed fire, "...rolling over our heads and out of the apartment door." An immediate increase in heat conditions was noted. Upon exiting the apartment, T-8's crew described a "tunnel of fire" coming out of the apartment and into the hallway. At 1841 hours, a radio transmission was made by an unknown source that heavy fire was observed in the hallway through a window at the stairwell landing.

At the same time, (1841) one minute after his arrival, Battalion Chief-11 (Command) noted heavy black smoke coming from the building and observed a “flash” through a second floor window. Command immediately ordered an evacuation of the building. Dispatch sounded the evacuation tones over the radio, and repeated the order to evacuate. Engines on the scene sounded their air horns to indicate that the order to evacuate had been given.

Firefighter #2 from S-303 reported hearing the engines on the fire ground sound their air horns, indicating to him that he needed to leave the building. Smoke conditions in the apartment had changed to thick black smoke, and the fire intensified, blocking his means of egress from the bedroom. Realizing that he needed to get out of the apartment quickly, Firefighter#2 crawled to a window on the Alpha side of the bedroom and signaled Firefighters below with his hand light to move a ladder to the window. Crews immediately moved the ladder, and at 1841, Firefighter#2 dove headfirst out of the window and down the ladder, where he was assisted by crews working on the exterior of the building.

At 1841, Firefighter Falkenhan declared, “Emergency” on his radio, and repeated the same seven seconds later. Command immediately queried S-303 for his location and the transmission “I’m down to the floor, heavy fire” was heard. At 1842 hours, Dispatch sounded emergency tones and restricted the Talkgroup to communications only between S-303 and Command. Seconds later Firefighter Falkenhan again keyed up his portable radio and advised “...trapped on the 3rd

floor, heavy fire on the Alpha/Bravo.” Fourteen seconds later he advised “I hear crew members, the third, MAYDAY, MAYDAY, MAYDAY.” Command notified Dispatch, “We have a MAYDAY” and was interrupted by a transmission from Firefighter Falkenhan, “urgent.” Command made several attempts to contact Falkenhan to ascertain his location and determine resources needed (**Location Unit Name Assignment Resources**) for rescue.

Upon hearing the MAYDAY, crews on side Charlie threw multiple ladders to the third floor balcony to assist with rescue. Heavy heat, smoke, and fire conditions made rescue difficult, but Firefighter Falkenhan was located and removed from the apartment via the balcony to the extended aerial ladder from T-8. He was unconscious and unresponsive at this time. Resuscitative efforts began immediately upon removal from the balcony, and continued enroute to the hospital. Firefighter Falkenhan succumbed to his injuries and was pronounced deceased at the hospital.

Fire Investigation Division – Origin and Cause

The fire originated in Apt. T-2, the first floor, Delta side apartment. After a thorough investigation by the Fire Investigation Division it was determined that the fire originated in the kitchen on the stove and consisted of heating a pot of oil to be used in food preparation. Refer to Origin and Cause – Investigation for reference.

Incident Information

Dispatch Information

1st Alarm Units 1818 hrs.	2nd Alarm Units 1829 hrs.	3rd Alarm Units 1845 hrs.	4th Alarm Units 1917 hrs.
T-8	Tow-209	T-221	E-321
T-1	T-313	E-7	E-291
FL-293	S-523	E-71	Balt. City E-27
E-291	Rehab 155	E-471	Balt. City E-20
E-11	M-17	E-381	
E-10	EMS-6	E-281	
E-1	E-55	E-12	
BC-11	E-391	BC-1	

Rescue Assignment 1825 hrs.	Working Fire Profile 1828 hrs.
M-11	Tow-17
EMS-1	M-8
E-8	E-17
	Safety Officers

Additional Units

M-117	Rehab 152
M-10	EMS-4
IV-110	Car 1
Mobile Command Post	M-395
FID 4,15,1	AU-248
EMS-7	M-14
OEM 2, 3	M-107
M-475	IV-285

Staffing

Career Staffing

The Baltimore County Administration and the Baltimore County Professional Fire Fighters Association have a Memorandum of Understanding, which includes a Minimum Staffing Provision. (MOU excerpt- Article 13, Section 13.4):

The County agrees not to utilize volunteer personnel to fill any of the below listed positions, except in cases of extreme emergency. Effective July 1, 2009, a minimum of one hundred ninety-one (191) employees shall be scheduled and working at all times. To ensure safety, engines and trucks shall be staffed with a minimum of four personnel, one of whom must be an officer. Medic units shall be staffed with a minimum of two personnel.

Minimum Budgeted Positions. The County shall maintain the following minimum budgeted positions under normal circumstances.

- 1. One (1) Captain for each Station on each shift.*
- 2. A minimum of one hundred thirty-nine (139) Lieutenants will be assigned to shift work including "E" shift effective July 1, 2009.*
- 3. One (1) Fire Specialist for each piece of apparatus on each shift.*
- 4. One (1) Fire Apparatus Driver/Operator for each piece of apparatus on each shift (two assigned for each Tiller Truck on each shift).*

If a vacancy occurs due to sick, vacation, bereavement or other types of leave, callbacks are made to backfill those positions.

Volunteer Staffing

The Baltimore County Fire Department has a minimum staffing requirement for responding apparatus; therefore, each of the 33 volunteer companies must comply with the staffing levels required for the specific incident otherwise, the next unit assigned to the incident is alerted.

Weather

On Wednesday evening, January 19, 2011 at 1800 hours, the weather for Hillendale, Maryland was as follows:

Temperature: 45 degrees Fahrenheit

Winds: Northwest at 12 MPH with gusts up to 17 MPH

At approximately 1900 hours, the conditions were as follows:

Temperature: 41 degrees Fahrenheit

Winds: Northwest at 12 MPH

Skies remained clear throughout the evening and the temperature remained constant after 1900 hrs. Winds remained steady from 10-12 MPH for the remainder of the evening.

The fire building, 30 Dowling Circle, is geographically positioned with the front of the structure facing west and the rear facing east.

Building Construction

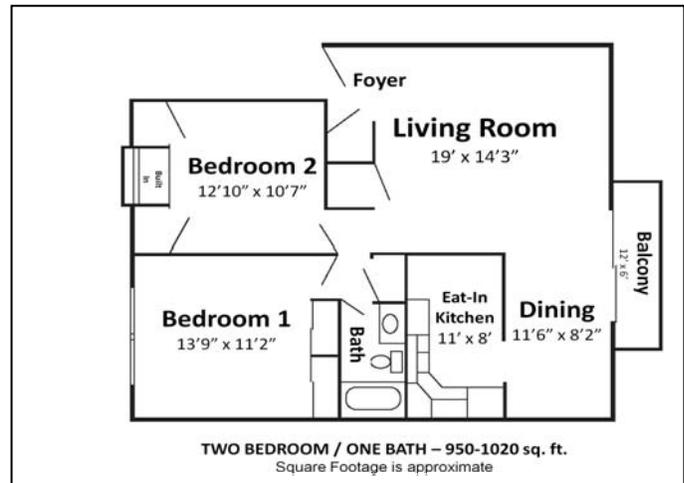
The development and construction of the Towson Crossing Apartments began in the early 1980's. The buildings are rated in the existing building code for occupancy as Residential 2 (R2). The building code would describe the construction type as Type III. This construction type includes those buildings where the exterior walls are of non-combustible materials and the interior building elements are of any material permitted by the building code.



Building Construction and Features

The subject apartment building, 30 Dowling Circle, is a three story, middle of the group, apartment building constructed on a reinforced concrete slab. The Alpha and Charlie exterior walls are wood framed construction with brick veneer attached by brick ties. The Bravo and Delta exterior walls are block masonry construction and separate adjoining apartment buildings. The interior partition walls consist of wooden 2"x4" wall studs covered with sheetrock. Paper faced insulation is found between the exterior walls, ceilings and party-walls that separate the apartments.

The apartment building contains six individual apartment units, which are approximately 1000 square feet in size per apartment unit. Two separate units are located on each floor and consist of two bedrooms, a living area, a dining area, a kitchen, and a bathroom. A



utility closet is located in each of the living areas. The closet is located along the Alpha wall, and contains the water heater and furnace.

The building is not equipped with an automatic fire suppression system. Smoke detectors were noted; however, it is unknown if they were operational at the time of the fire. A fire extinguisher was noted on the landing between the second and third floor levels of the building.

Topography

From side Alpha the building has two and a half stories above grade while side Charlie is three stories above grade.

The first floor of the building is approximately five feet below ground level with a 20 foot set back from the apartment building parking lot. Side Charlie of the building is at ground level but slopes upward approximately 8 feet with a set-back of 110 feet from the rear alley.



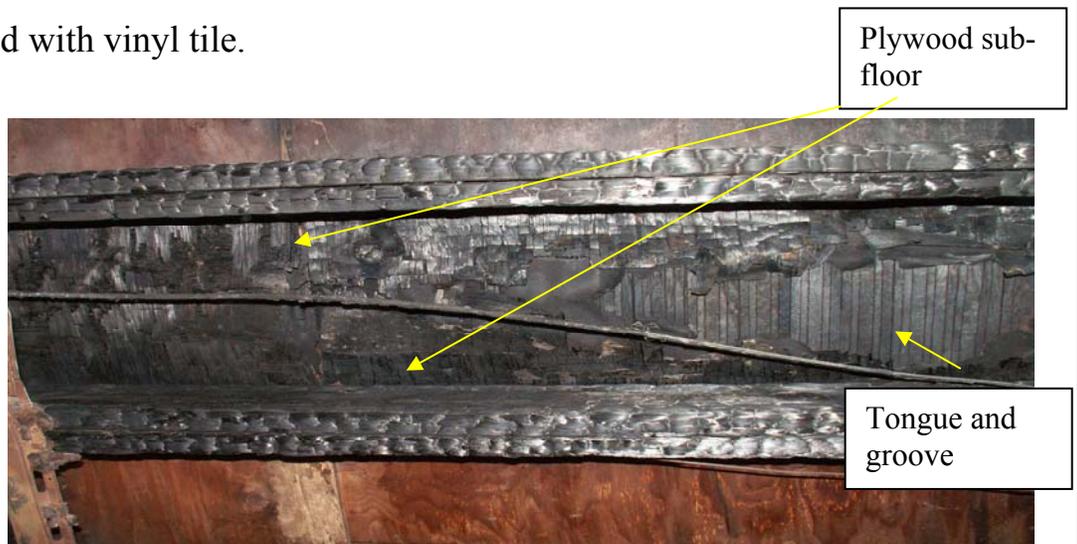
Roof

The roof is constructed of a lightweight truss assembly consisting of 2'x6' stringers connected by gusset plates. The truss assembly is covered with 5/8 inch plywood and asphalt shingles.

Floor and Ceiling

The floor assembly consists of 2x10 inch floor joists covered by plywood, wooden tongue and groove planking and finished with carpet. The joists run from Alpha to Charlie and are supported by the interior bearing walls. The kitchen floors in all of the units are covered with vinyl tile.

The ceilings throughout the building are sheetrock nailed to the floor joists of the



apartment above with the exception of the third level in which the sheetrock is nailed to the roof joists.

Balconies

The balconies are located on side Charlie of the building. The balconies located on levels two and three consist of 5/4" deck boards over 2"x10" wooden joists. The joists are cantilevered off of the floor/ceiling assemblies of levels one and two.

The first floor balconies are made of concrete and are at ground level. All balconies are accessible through a single pane sliding glass door located in each apartment.



Origin and Cause Investigation

The fire origin and cause investigation was conducted by the Baltimore County Fire Department's Fire Investigation Division. Other agencies provided assistance in the initial scene and follow up investigations which included the Baltimore County Police Department Homicide Unit and crime lab technicians, and the Bureau of Alcohol, Tobacco, Firearms, and Explosives, who provided investigators and fire protection engineers.

On 1-19-11 a fire occurred at 30 Dowling Circle. The fire originated in apartment T-2, the right side terrace level apartment. After a thorough investigation by the Fire Investigation Division, it was determined that the fire originated in the kitchen on the stove where a pot of cooking oil was being heated. An interview with the two occupants revealed that occupant #1 said she had put a pot containing cooking oil on the stove and turned the burner on. She left the pot unattended for approximately 5 minutes. Occupant #2 was in her room, on her computer, when she went to get a glass of water. She saw a reflection on the wall and looked into the kitchen and saw the pot overflowing and fire rising up to the cabinets. She yelled for occupant #1 to come out and they proceeded to open the patio slider to remove the smoke. They attempted to locate occupant #1's cell phone and after locating the phone, dialed 911. They both said it got extremely smoky and both occupants exited the apartment through the front entrance door, leaving it propped open. An examination of the scene by investigators confirmed the fire originated in the kitchen with the pot of oil. The burner heated the oil to its ignition temperature, resulting in flames extending above the pot to the stove hood and cabinets. Further investigation revealed that the patio slider was open during the fire. This was confirmed through an examination of the slider track. Burn patterns also confirmed the front apartment door was open during the fire.

Fire Progression Sequence Overview

The fire progression sequence was rapid and was influenced by several external factors. The sequence was based upon witness statements, analysis of burn patterns and fire photographs. Using this information in addition to detailed building measurements, a computer fire model was produced by ATF to explore the movement of heat and smoke throughout the building, focusing on the stairwell. The model verified that the stairwell acted as an open channel for smoke and fire to spread between the first and second levels, resulting in a flashover of Apt. A-2 shortly after it became fully involved. For details regarding the input data, limitations and results of the computer fire model, refer to the fire modeling section of this report (Appendix B).

The initial fire was the result of an overheated pot of cooking oil left on a stove burner in the kitchen. The burning cooking oil overflowed out of the pan, allowing flames to spread to the cabinets located above the stove. Heat and smoke quickly filled the kitchen with spillover into the dining room area. The relatively small volume of the kitchen combined with its high fuel load and sufficient ventilation caused the kitchen to reach the flashover stage. The flames from the kitchen then ignited combustibles in the adjacent living and dining rooms. With both the rear slider and front door open, there was sufficient ventilation to allow the T-2 apartment to become fully involved. The open front entrance door to the T-2 apartment allowed for heated gases and smoke to enter the foyer area and stairwell, making it untenable and blocking the primary means of egress for the occupants above the fire. Flames also extended out of the rear slider and ignited both the second and third level wooden balconies above. The thermal impact from the fire venting below caused the A-2 apartment slider to fail. Hanging plastic

blinds located just inside the A-2 slider ignited and melted to the floor, landing adjacent to a couch in the apartment.

The fire in Apt. T-2 was extinguished using hose lines from sides Alpha and Charlie, however the burning blinds in apartment A-2 produced a self sustained second fire that eventually ignited a polyurethane couch. The fire progressed across the couch, igniting a second adjacent polyurethane couch. The fire progression within the A-2 apartment was confirmed by several witnesses. As the second couch became involved in flames, the A-2 apartment door was open, allowing sufficient ventilation to drive the apartment to the flashover. Flashover of the A-2 apartment resulted in a sudden increase in the heat release rate in the apartment, filling the stairwell with flames and smoke. The gases in the unvented stairwell rapidly ignited after the flashover in the A-2 apartment. The entrance door to apartment B-2 was left open by firefighters while conducting search operations. The open apartment door served as a natural path of travel for the flames and smoke that accumulated in the stairwell. The flames traveled into the apartment, igniting several couches which produced sufficient energy to cause a flashover in both third floor apartments (B-1 and B-2), which was followed by full room fire involvement. Several hand lines were then used to contain and extinguish the fire at this point.

Fireground Operation Sequence

Chronology of Significant Events



Event corresponds with graphical timeline

1816 hours.

Call received by 911 for a reported kitchen fire at 30 Dowling Circle, Apartment T-2.



1818 hours.

Call dispatched for E-10, E-11, E-1, E-292, T-1, T-8, BC-11, and S-303.

1819 hours.

T-8, E-10, BC-11, E-1, T-1, E-11 en route.



1820 hours.

E-11 arrives and reports a 3 story brick garden apartment with smoke showing and assumes Command. Crew encounters heavy smoke conditions and high heat coming from the foyer area (side Alpha). Command (Capt. E-11) instructs the next engine to grab the hydrant at Deanwood and Dowling (bring him a line).

1821 hours.

Command advises going to make an aggressive interior attack with a 1 3/4" line.

1822 hours.

E-292 en route.



1823 hours.

Command advises Dispatch that they are going to Limited Command due to rescues.

The Capt. (E-11) and driver (E-11) place a ladder to the third floor apartment window (Alpha /Bravo) and rescued 1st victim.

E-10 arrives and lays a line from the hydrant at Deanwood and Dowling. E-10's crew is assigned to pull a backup line and assist E-11. Lieut. (E-10) positions the hose line outside front window of Apartment T-2. Capt. (E-10)

assists in advancing initial hose line to interior crew in the foyer area of the building.

1825 hours. - 1826 hours.

BC-11 upgrades fire to a rescue box while en route.

Truck 1 arrives and sets up on the Alpha side and throws ground ladders on side Alpha.

E-1 arrives and hooks up to the hydrant at Deanwood and Dowling. Command asks E-1 to go to the rear (side Charlie). E-1 acknowledges. E-1 takes a 35' ladder to side Charlie and searches Apartment B-1. Capt E-1, through post-fire interviews, reported that fire was observed venting from the sliding door of apartment T-2. (This information was not relayed to Command)

1827 hours. – 1828 hours.

Command requests 2nd alarm.

1829 hours.

Command walks around to side Charlie and gives a status report on the radio (360°). He advises units that the fire is extending from balcony to balcony.

2nd alarm dispatched.

Truck 1's crew conducts a primary search of the second floor from side Alpha and initiates a search of Apartment A-2 via ladder to window because they cannot get through the stairway.

1830 hours.

Reports that fire is extending from the rear of apartment T-2 to the balconies of apartments A-2 and B-2 are relayed.

T-8 arrives and crew throws a 16' ladder to apartment A-1 from side Charlie. They break the sliding glass door and begin to search apartment before leaving through the front door to search adjacent apartment A-2.

E- 292 arrives and initiates a split lay from the water source. An attack line is pulled off of E-292 and placed in-service on side Charlie. Crews knock down the fire on the balconies.

Command directs the crew of E-292 to enter and attack the fire in Apartment T-2. During interviews the crew reports encountering minimal fire but high heat.

 **1831 hours. – 1833 hours.**

S-303 arrives and crew (FF Falkenhan and 3 firefighters) get equipment and report to the front of the apartment building. One firefighter does not enter the building during operations. One firefighter arrives at the front of building first and is requested to assist on a hand-line, which is located in Apartment T-2.

Smoke conditions improve in the foyer so Falkenhan and the 3rd firefighter enter the apartment building (side Alpha) and begin search of Apartment A-1 followed by Apartments B-1 and B-2. It should be noted that FF Falkenhan had the only radio between the two.

1834 hours.

Command advises that the officer of E-292 would be division Charlie.

E-1's crew leaves the 3rd floor via exterior ladder after searching Apartment B-1. Upon their descent, E-292's crew is already inside Apartment T-2 fighting the fire.

 **1835 hours. – 1837 hours.**

E-8 arrives on side Charlie.

Lieutenant (Truck 1) calls to Command with urgent message. Reports Victim #2 found in Apartment A-2 during a secondary search by a firefighter (Truck 1). During post-fire interviews, the firefighter on Truck 1 noted fire in front of the rear sliding doors, which was illuminating the room and assisted in locating the victim. He believes the fire involved the draperies that had fallen to the floor. Flames were also visible on the rear deck and were approximately 5' high. He also believes the rear sliding door was missing at that time. (This information was not relayed to Command)

 **1838 hours.**

S-303 inquires about the ongoing rescue in Apartment A-2 and advises that they will continue a search of the 3rd floor. Reports high heat conditions.



1839 hours.

BC-11 arrives and assumes Command.

Exterior crews located on ladders on the Alpha side of the apartment building assist in the removal of the 1st victim.

T-8's crew enters Apartment A-2 from the stairway door and locates a 3rd victim in a chair. During post-fire interviews it was discovered that the firefighter (T-8) who was searching by the rear sliding door noted the door was completely out at the time of their search. He also noted the fire had extended to the love seat located along the Charlie wall. (This information was not relayed to Command)



1840 hours.

The Lieut. (T-8) and firefighter (T-8) drag the 3rd victim from Apartment A-2 through the front door.

Flashover occurs in Apartment A-2.

Conditions deteriorate rapidly with heavy fire coming from behind crew and exiting the door into the stairs.



1841 hours.

Reports of heavy fire in the stairway exiting from Apartment A-2 and extending to the third floor.

Crews operating in the stair area are driven back by the fire.

BC-11 tells all units to evacuate the building. Evacuation tones follow.



1842 hours.

S-303 (FF Falkenhan) calls a MAYDAY. Gives location as 3rd floor Alpha/Bravo corner with heavy fire. (See MAYDAY section)

Dispatch activates tones and restricts talk group for the MAYDAY.

Communications continue with FF Falkenhan with MAYDAY being repeated.



1843 hours.

The other firefighter with FF Falkenhan exits a 3rd floor window (side Alpha) after searching the bedroom and having his egress cut off by the fire.

1844 hours. – 1849 hours.

Communications with FF Falkenhan continued for several minutes.



1850 hours. – 1854 hours.

Truck-1 cuts hole in the roof.

Search of the third floor finds FF Falkenhan unconscious near the rear slider in Apartment B-2.



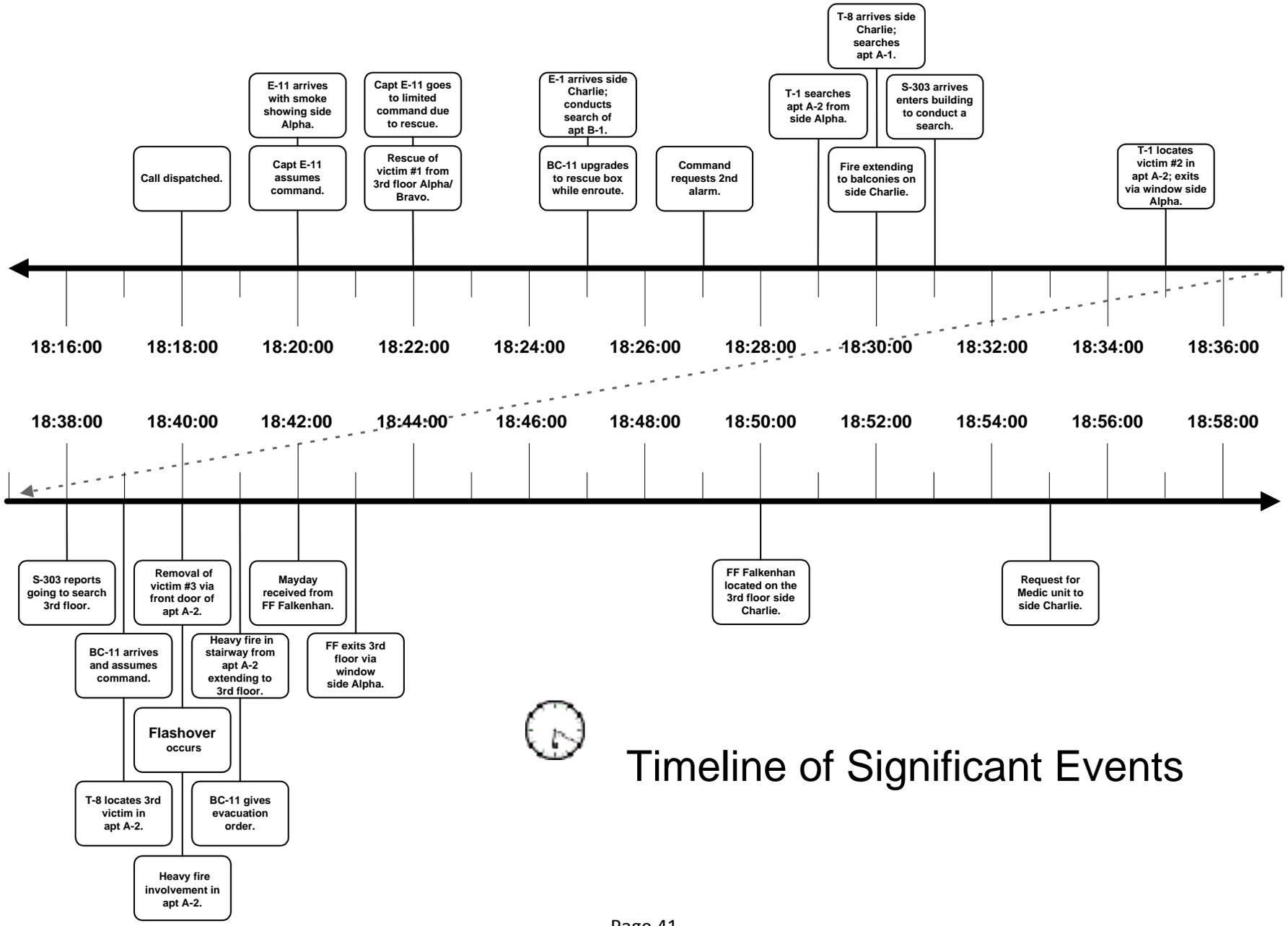
1855 hours.

Request for a medic to report to side Charlie.



Event corresponds with graphical timeline

See *Appendix O – Detailed Radio Transmissions* for the transcribed radio communications.



Timeline of Significant Events

Findings, Discussion, Recommendations

Crew Integrity

Per Baltimore County Fire Department's Standard Operating Procedure, Tactical Operations Manual #7, Appendix C, Section 2, crews involved in incident operations in an environment that is immediately dangerous to life and health (IDLH) will at all times utilize the "buddy" system of teams of two or more. Personnel are prohibited from entering IDLH environments alone. Specifically, team members are required to remain in direct visual or voice contact with one another at all times. Each team member is responsible to provide fellow team members with assistance if needed, to warn of hazards encountered, and to routinely check on the welfare of fellow team members.

Findings

1. While Firefighter Falkenhan and his partner entered the third floor apartment (Apt. B-2) as a team, they separated shortly thereafter to perform a search for victims. Upon entering the door Firefighter Falkenhan proceeded left through the living room area; his partner proceeded to the right to search the bedroom and bathroom areas. At the time of their separation the smoke and heat conditions in the apartment were moderate. Fire, smoke, and heat conditions worsened shortly thereafter, trapping Firefighter Falkenhan's partner in a bedroom on the Alpha side of the apartment, and prevented him from rendering assistance to Firefighter Falkenhan.

Discussion: Although it is not possible to determine whether maintaining direct visual or voice contact would have allowed Firefighter Falkenhan's partner to

assist in his rescue, it is recognized that maintaining crew integrity decreases the time required to render assistance to a team member in the event of an emergency.

Recommendation:

- Company officers shall ensure that crew integrity is maintained at all times by all personnel operating in an IDLH environment.

2. Firefighter Falkenhan was equipped with a portable radio, which he used to notify Command that he was in trouble and required assistance. His partner was not carrying a portable radio, although one was available for his use on S-303. Consequently, he was unable to alert FF Falkenhan as to the change in fire conditions or request assistance on his behalf.

Discussion: It is understood that equipping all entry personnel with a portable radio promotes safety, enhances communications, and allows personnel to more easily maintain crew integrity. However, given the rapid change in fire conditions and the fact that the radio system was burdened with excessive radio traffic, it is not certain whether Firefighter Falkenhan's partner would have been able to alert him (Firefighter Falkenhan) to the change in fire conditions or been able to facilitate a timelier rescue had he been carrying a portable radio.

Recommendation:

- No personnel should operate in an IDLH environment without a portable radio.

MAYDAY and Rapid Intervention Team

MAYDAY is a term used to indicate that a firefighter is lost, trapped, or is in an immediate life threatening situation. When a firefighter determines they are at risk, lost, or trapped they are to transmit a MAYDAY call, which communicates their situation to the Incident Commander, Dispatch, and other units on the fire ground. In Baltimore County, as it is in many jurisdictions, that report takes the format of LUNAR, which is an acronym for Location, Unit Number, Name, Assignment, Resources needed for rescue from the precarious situation. If possible, personnel should activate their emergency button on the portable radio, and activate the PASS (Personal Alerting Safety System) Device manually and intermittently. This procedure is described in detail in Baltimore County's Tactical Standard Operating Procedure #09, MAYDAY Procedures (Appendix F).

On this incident, FF Falkenhan called for a MAYDAY approximately one minute after the call for evacuation was ordered by Command. The initial MAYDAY call came at approximately 1842 hours with the following transmissions seconds apart. Other transmissions from Command or Dispatch are included.

FF Falkenhan transmits:

“303 Emergency; 303 Emergency”

Command replied:

“Evacuate the building, do we have a MAYDAY?”

Dispatch queried:

"Squad 303, Squad 303 location?"

FF Falkenhan transmits:

“I'm down to the floor, heavy fire”

Dispatch replied:

“Squad 303”

EVACUATION TONES, “Attention all units operating on fire box 11-9. This talkgroup is now restricted. Talk group is now restricted. Talkgroup now restricted. Squad 303 from Dispatch”

FF Falkenhan transmits:

“Trapped on the 3rd Floor, heavy fire” ... breathing ... “on the Alpha Bravo” ... inaudible

Dispatch replied:

“Heavy Fire Alpha Bravo corner”

FF Falkenhan transmits:

“Yes ... yes I hear I hear crew members (breathing) the third ... MAYDAY MAYDAY MAYDAY”

Dispatch replied:

“OK what additional resources do you need?”

“Dispatch from Command we have a...”

FF Falkenhan transmits:

“URGENT”

Dispatch announced:

WARBLE TONES, “Attention all units on fire box this talk group is now restricted. BC 11 from Dispatch you have a MAYDAY from Squad 303 portable 1 3rd Floor heavy fire Alpha/Bravo corner, Command?”

Command replied:

“3rd Floor Alpha/Bravo corner”

Dispatch:

Inaudible ... “Squad 303 portable from Dispatch if you can hit your emergency, hit your emergency”

FF Falkenhan transmits:

“Get a crew to the floor”

Command replied:

“Squad 303 portable”

“Dispatch ... (cut off)”

Inaudible radio noise

FF Falkenhan transmits:

“Chief (inaudible radio noise) Squad 303 portable to Command”

“Go ahead Chief”

“Ahead Chief go ahead “

Command replied:

“Squad 303 are you (inaudible) ... trapped”

FF Falkenhan transmits:

“I am 3rd floor in the Alpha Delta Corner (hallway)”

Inaudible radio noise

Command queried:

“Firefighter Falkenhan from Command, Firefighter Falkenhan do you read?”

FF Falkenhan transmits:

“Yes I can read (breath) I need a hand line now Chief”

Command replied:

“repeat”

FF Falkenhan transmits:

“Chief I need a hand line ... I'll keep ... “

Command replied:

“Do you say you need a hand line”

“Falkenhan come out of the building, can you come out of the building”

“All units from Command, we have a MAYDAY on the 3rd Floor”

FF Falkenhan transmits:

“I’m on the 3rd floor ... inaudible radio noise “

Command replied:

Inaudible radio noise ... “From Command do you copy”

Inaudible ... “Mark Falkenhan”

Dispatch Announced:

WARBLE TONES, ”Attention all units fire box 11-9, This talkgroup is restricted to Command and the trapped firefighter ... all units switch to Talkgroup 1-3”

... Inaudible radio noise ...

FF Falkenhan transmits:

“Help”

... Inaudible radio noise ...

... Inaudible radio noise ...

Command replied:

“Falkenhan from Command”

... Inaudible radio noise ...

“Falkenhan from Command”

... Inaudible radio noise ...

FF Falkenhan transmits:

“Go Ahead”

Radio key up ...

Radio key up ...

Radio key up ...

... Inaudible radio noise ...

Command replied:

“Falkenhan from Command”

FF Falkenhan transmits:

Sound of buzzing on radio

... Inaudible radio noise “Go ahead”

Sound of open mic

... Inaudible radio noise “Go ahead”

“Go Ahead Chief” – Last words transmitted by FF Falkenhan at approximately 1850 hours.

Findings

1. FF Falkenhan initially reported being on the Alpha/Bravo side.

Interviews and witness statements indicate he was actually on the Charlie/Delta side of the structure.

Discussion: FF Falkenhan was well trained and it is likely that his disorientation was due to deteriorating fire conditions.

2. While Firefighter Falkenhan did not give a complete LUNAR according to the Tactical Operations Manual #09, he did cover most of the critical information that is required.

Discussion: The LUNAR was broken up into several transmissions and most of the content was covered by the Firefighter during his various transmissions. It is conjectured that FF Falkenhan did not initially realize how bad the situation was and he was simply calling for help by someone bringing a charged hose line to the 3rd floor. The tactical operations manual specifically states, “early notification of your situation is the key to your survival.”

3. Dispatch asked FF Falkenhan to hit his emergency button. It is unclear whether that action was ever taken.

Discussion: An important feature in our portable radios is a small orange button that is embedded in the top part of the radio. We have all heard the prompt...”Unit X from Dispatch, check your display and advise.” This is what actually happens at Dispatch when this occurs:

- a. There is an immediate audible *and* visual alert made at the Dispatch center.
- b. When the emergency is sent, the communications system grants *that* radio, “System Priority Assignment”

Once the radio’s Push-to-Talk (PTT) switch has been activated, the sending radio and all other radios monitoring the same talkgroup will be assigned a dedicated radio channel for 30 seconds securing its use during the emergency. The user merely presses the PTT for immediate voice access until the sending radio resets the emergency button. To put it plainly, when the orange button is pressed, the radio has the capability to talk over any other radio that keys up during this 30 seconds. This would be especially important in the event of a “Signal 13”, “MAYDAY”, etc. After the 30 seconds, the radio defaults back to a normal priority and will not be put to the “front of the line”.

Recommendation:

- If possible, the firefighter should activate his/her Emergency button on the portable radio.
- Once personnel have called a MAYDAY and provided the information needed (LUNAR), they will activate their PASS Device manually and intermittently.

5. Dispatch will assign an additional alarm to an incident with a MAYDAY, to be available for the Incident Commander to deploy as needed.

Discussion: An additional alarm was alerted by Dispatch at the time of the MAYDAY.

6. Dispatch attempted to keep extraneous radio traffic off the channel and made continuous attempts to get crucial information from the downed firefighter.

Discussion: The newly implemented radio system will assist with this task.

7. At one point during the MAYDAY, Command asked FF Falkenhan if he could get out of the building. FF Falkenhan was unable to self-rescue.

Discussion: FF Falkenhan's movements, activities, and self-rescue efforts on the third floor during his MAYDAY event are impossible to factually recreate. The reason(s) FF Falkenhan did not, or was not able to self-rescue is unclear.

8. Baltimore County's Tactical Standard Operating Procedure #18- Rapid Intervention Team requires that there be a Rapid Intervention Team established for the safety of all crews operating on an emergency incident.

Discussion: While no formal Rapid Intervention Team had yet been established, units on side Alpha and on side Charlie initiated operations to find and evacuate FF Falkenhan. In addition to these activities, several more ladders were thrown to the third floor and hose lines were deployed during the minutes after the MAYDAY was called.



Incident Command

To safely and effectively manage daily emergencies and other major incidents, the Baltimore County Fire Department adopted the Incident Command System (ICS). This management tool is consistent with the National Incident Management System but varies in some terminology and department-specific identifiers. The ICS is most clearly defined in the Department's Standard Operating Procedure Tactical Operations Manual #07, Incident Command System (ICS) (see Appendix D) which outlines policies and procedures that are to be implemented on incidents requiring the management of complex operations or where deemed necessary by the Incident Commander.

Command coverage in Baltimore County is divided into three divisions based on geographic location. A career division chief was responsible for each division with a career battalion chief or captain acting as a battalion chief, providing command coverage 24 hours per day. Of the department's 97 fire captains, 76 are cleared to function as a battalion chief. The battalion chief is dispatched on pre-assigned incidents that are deemed to require a supervisor, based on the possibility of complex operations or personnel management needs. Back-up coverage or certain functions within the ICS (Command and General Staff positions) are supported by other battalion chiefs or on-duty or on-call support service personnel and off-duty command staff.

Committee members are cognizant of the fact that this was a fast-moving incident with many dynamics occurring in a condensed amount of time. Heavy smoke and high heat levels made entry difficult and an obvious rescue placed a strain on initial resources. The initial fire building was adjoined on both sides by apartment buildings making a 360° inspection a time consuming process. This further compounded the initial size-up.

Findings

1. Engine 11 Officer-in-Charge (Captain E-11) was the first engine to be dispatched to the incident, as the apartment complex was located within their first-due area. Captain E-11 initially took Command and gave an appropriate Brief Initial Report (BIR).

Discussion: As delineated in Tactical Operations Manual #07, the first unit on the scene must initiate whatever parts of the Incident Command system are needed to effectively manage the incident scene. The initial IC shall remain in command until command is transferred or the incident is stabilized and terminated. His report “Engine 11 arrived; we’ve got a 3 story brick garden apartment. We’ve got smoke showing. Captain off E-11 will be Command. Have the next engine in grab the hydrant right at Deanwood and Dowling” (bring him a line).

2. Command advised “at this time we are going to be doing an aggressive interior attack with a 1 ¾” hand line”.

Discussion: This transmission attempted to paint a picture for incoming units as to the attack profile that was being initiated by the first-in crew.

3. Within 2 ½ minutes of arrival, Command advised Dispatch that he “was going limited command. We have rescues.”

Discussion: Limited command mode is for situations that require immediate action to stabilize and require the Company Officer’s assistance and direct involvement in the attack. Per the Tactical Operations SOP, limited command signals the officer of the next arriving engine to assume command. The Captain of E-11 continued to make transmissions as if he had retained Command, assigning the officer of the next arriving engine to assist the crew on the attack line and assigning crews to the Charlie division.

Recommendation:

- Tactical Operations Manual 07 allows Incident Commanders the flexibility to adapt to fast-moving and complex incidents. When re-assuming Command, the IC must be identified (verbally through Fire Dispatch) to allow units involved and responding to know who is in command.

4. After consulting with the officer on the 2nd arriving unit (E-10), Captain E-11 decided to perform a 360° of the building to get an idea of what conditions were on the Charlie side of the structure.

Discussion: The Incident Commander had an initial vantage point from the front of the structure upon his arrival. Conditions presented from that view indicated an apartment fire on the Alpha/Delta side of the structure. Captain E-11 based his initial tactics on entry into the front of the structure and attacking the fire from the stairwell. The IC is responsible, per the SOP, for providing a proper size-up of conditions, life hazards, probabilities, etc. of the incident. The IC gave a report and size-up based on his observations from the Alpha side of the building but due to rescues, building size, and limited access, it was not until minutes into the incident that he walked around to the rear to complete his 360° view of the building. He directed the next arriving engine (E-1) to go to the rear because there was no access from the front. The fire building was in the middle of the group of adjacent apartment buildings making for a long walk to access side Charlie. A more expedient 360° would have shown that there was heavy fire in the rear that was extending unchecked from the sliding doors on the first floor to the wood decks above.



This is the view from side Alpha for initial arriving units.

1818:20 hrs.



View from side Charlie taken by a homeowner of property facing the Charlie division. This photo shows fire progressions to the 2nd floor balcony.

Approx. 1826 hrs.

As can be seen from the above photographs of the incident, conditions on side Alpha upon arrival were noticeably different than those on the Charlie side. A timely initial 360° gives the Incident Commander a better picture of what was actually occurring on the fire ground.

5. The OIC assigned E-292 to assume Command of Charlie division upon his arrival.

Discussion: Prior to E-292 arriving, E-1 had already arrived on scene and assumed a position to the Charlie side of the structure. The Captain of E-1 instructed his crew to ladder the 3rd floor right apartment and proceeded with his crew to search the apartment. He stated in his testimony that he saw fire venting from the apartment but no communications were made to Command. As the first piece of apparatus to arrive on Charlie division, the Captain should have reported this observation to Command. As identified in SOP Tactical 08, he correctly did not assume supervision of Charlie division but chose to aid in search operations of the 3rd floor. Since this was a large building for the IC to perform a 360° on (see photo below), a conditions report to Command would have assisted the IC in sizing up the fire conditions.



Aerial view showing size of complex and impediment to rapid 360°

View from side Alpha showing adjoining structures to apartment building.



Recommendations:

- Incident Commanders must understand that an early initial 360° would give the IC the information needed to develop effective strategy and tactics for incident mitigation.
- Additional arriving units must give the IC an updated report on fire conditions when noticeably different than those announced in the Brief Initial Report.
- Arriving units should prompt the IC to assign them supervision of a division when conditions warrant such action.

- The IC must ensure that all division and group supervisors are properly deployed and verbalize same on the radio for Dispatch and units involved on the incident.
- Reinforce the importance of the ICS and its functional components for all officers.

For the Incident Commander to properly manage complex incidents, a complete understanding of the importance of early assignments to critical functions must occur. A department-wide review of the ICS system should be undertaken to ensure that both career and volunteer personnel are able to quickly and effectively assign resources and to identify critical points in incident progression. This could be done with After Action Reviews per SOP, applying ICS principles.

5. The IC had a face-to-face meeting with the officer of E-292 and advised E-292's crew to get a line into the fire apartment to try to knock down the fire since the crews on the Alpha side were having trouble making entry. At that point he also advised the officer from E-292 that he was going to be Charlie. Through witness statements, the officer from E-292 assisted the crew with hand line advancement into the structure.

Discussion: When so designated, division supervisors need to “step back” from hands-on operations and assume the duties that they were directed to perform by the IC.

6. The IC returned to the Alpha side of the structure as T-1 crew was calling Command and advising that they had entered the 2nd division via ground ladders above the fire floor and located a victim and needed assistance with removal. No indication of interior conditions was ever transmitted to

Command even though fire was observed in a corner of the apartment on the 2nd floor. Communications were difficult due to heavy radio traffic.

Discussion: Anytime crews encounter a change in fire conditions or discover fire advancing, Command should be notified so that a change in tactics can be considered.

7. The IC directed the crew from T-8 to assist with search and rescue. They entered the building from Charlie division (Apt. A-1) and proceeded into the 2nd division through the front interior stairwell door. They also discovered a victim and noticed fire in the rear corner of the apartment above the 1st floor (Apt. A-2). No condition update was transmitted to Command although the crew exited very quickly due to flashover conditions.

Discussion: It is important for the IC to maintain control over the structure and to maintain accountability of crews working on the interior. A change in fire conditions, as noted throughout this report, should be reported to Command.

Recommendation:

- Ensure a manageable span-of-control is maintained throughout the incident. An effective span-of-control should be no more than 5-7 persons. Assigning groups or division supervisors helps ensure that this is maintained. In this instance, a supervisor should have been assigned to division 2.

Since there was only one division established during the initial phases of this incident, it must be emphasized that group and division supervisors are critical functions. Once delegated, the supervisor should perform autonomously within his/her respective area and the IC should provide him/her with the requested resources and receive ongoing feedback only. This gives that supervisor tactical authority and avoids micromanagement of the incident.

8. Captain E-11 advised that he never saw S-303 and FF Falkenhan enter the building.

Discussion: Accountability on the fire ground is one of the most important items that an IC needs to address. Squad 303's crew should have reported their tactical assignment intentions either face-to-face or via radio. Knowing that their assigned duties were search and rescue, they entered the structure to perform these tasks. Once inside S-303 gave a report of heavy heat and that they were advancing to the 3rd floor. At this point the IC knew they were inside and understood their intentions.

9. No divisions or essential functions other than Charlie were ever assigned.

Discussion: As stated in SOP Tactical Operations Manual 07, "it will be the responsibility of the IC to develop an organizational structure as soon as possible after arrival and implementation of initial tactical control measures." The IC assigned Charlie division to E-292 but never assigned anyone to the 2nd and 3rd divisions. In addition, the essential functions of RIT and Safety were never announced over the radio. The safety of firefighting personnel is the major reason for establishing divisions or groups and helps to divide the incident into manageable parts. This enables the IC to concentrate on strategy and tactics while allowing the division supervisors to manage their crews. This would have reduced the number of radio communications, a factor that was very prevalent in this incident. Those divisions are responsible for communicating CAN (Conditions, Actions, and Needs).

10. Capt. E-11 maintained Command until the arrival of BC-11. BC-11's initial impression was one of improving fire conditions (see photo below).

After a face-to-face pass on, BC-11 noticed conditions in the structure rapidly

deteriorating and ordered the building evacuated approximately 90 seconds after his arrival.

This photo depicts fire conditions as described by crews indicating that they thought that the fire had been knocked. Moments later, flashover occurred.



1837 hrs.

Discussion: Given the amount of activity occurring at this incident and the limited pass-on that he was able to receive from the Capt. of E-11, BC-11 made a quick judgment call to evacuate personnel from the building. This order was given as the building fire conditions deteriorated with crews operating inside. At about the same time the building was being evacuated, FF Falkenhan declared his “Emergency”.



1841 hrs.

Recommendation:

➤ Evaluate the efficiency of command and control as incidents escalate.

When confronted with large, complex or rapidly developing incidents, company level officers may be required to simultaneously accomplish incident mitigation as well as command and control. These duties include the requirements to obtain situational/status awareness, implementing and tracking personnel accountability, command and fire ground communications, formulating strategies and tactics, and many other critical functions. With and prior to the arrival of the sustained IC (BC or higher), the IC should consider the use of command aides to assist with both

tracking and communications, establish a strong command presence, and upgrade the incident immediately, requesting additional resources and alarms.

12. FF Falkenhan's initial LUNAR report indicated that he was on the Alpha/Bravo corner of the 3rd floor and he later communicated that he was on the Alpha/Delta corner.

Discussion: MAYDAY situations are always confusing and anxious moments for all involved. It is instances such as this that require structure and supervision. Several crews immediately engaged in rescue operations once the MAYDAY was declared. Crews operating on the Charlie division threw multiple ladders in an attempt to gain access to the 3rd floor. Off-duty Battalion Chief-1 arrived and reported to side Charlie to direct resources. Safety became a primary concern as the integrity of the balcony from which rescue efforts were initiated became an issue. Once located, crews had difficulty removing FF Falkenhan from the 3rd floor balcony due to smoke conditions, and access and size limitations.

Recommendation:

➤ **A Rapid Intervention Team is a vitally important part of the ICS and its assignment should not be overlooked.**

Current response profiles identify that a Rapid Intervention Task Force be dispatched on working incidents. The current RIT SOP identifies that the 4th engine assumes RIT. Incident Commanders need to be reminded of the importance of this function and always need to keep assigned personnel in this role as soon as practicable. Consideration should also be given to assigning a separate team to the rear of large or challenging incidents. Despite this, when the MAYDAY was initiated, there were ample crews and resources to perform rescue efforts.

Strategy and Tactics

To effectively and safely mitigate an emergency incident, the fire service has embraced a more analytical approach to fire ground management. In the initial phase of an incident, the Incident Commander (IC) is responsible for laying the ground work to get the incident moving in an organized and safe manner. After the incident size up, the IC develops an incident action plan which utilizes strategies and tactics to achieve incident mitigation.

International Fire Service Training Association (IFSTA) defines strategy as “the overall plan for controlling the incident...broad general statements of the overall outcomes to be achieved.” From the onset of receiving the emergency call, the IC is receiving information and making decisions in a compressed time frame. Some of these decisions are based on time of day, weather, staffing levels, crew ability and mode of operation. For any emergency operation, the strategy utilized by the Incident Commander is essentially the same. These priorities are: life safety, incident stabilization and property conservation.

Baltimore County Fire Department adopted through its Tactical Operation Manual #7 Section 4.1- Incident Management System (Appendix D), the widely recognized work by Lloyd Layman (*Fire Fighting Tactics*). Essentially, Layman created a list of strategic priorities which can be applied to any structural firefighting emergency. His list of priorities is represented by the acronym RECEO-VS. (**R**escue, **E**xposure, **C**onfinement, **E**xtinguishment, **O**verhaul, **V**entilation and **S**alvage). Utilizing a standard approach to incident mitigation allows the IC to take in the big picture and direct the efforts of emergency personnel in an organized manner.

This approach to incident mitigation is also echoed in Baltimore County Tactical Operations Manual #8- Fire Ground Operations, which states that

“although these objectives are prioritized, they do not dictate which tactics should be used to accomplish the objectives.” The policy goes further to state that “An Incident Commander must assign resources only to the highest, uncompleted objective until sufficient resources arrive to meet those objectives and then move down to lower priority objectives.”

It is also noted that as the incident progresses, it may be necessary to reallocate resources to higher priority objectives even after initially meeting the objective. i.e., a new exposure, or a rescue later into an incident.

IFSTA defines tactics as “less general and more specific than strategies” and “statements of measurable outcomes”. These include but are not limited to securing a water source, hose line selection and placement, horizontal vs. vertical ventilation, etc.

Findings

1. First arriving engine (E-11)

Upon arrival to the structure, E-11 passed a water source at Deanwood and Dowling (see map) and began incident operations.

Discussion: The driver of E-11 stated that he had knowledge of another hydrant located at the end of the court. Unfortunately, he was unable to hook up to this hydrant initially because of assisting with the rescue of a civilian (#1) from a third floor window. Consequently, it was necessary for three engines to complete the initial supply line. (E-11, E-10, E-1). There is always a chance that a driver will be needed in an emergent situation before he can “hand-jack” a supply line.

Recommendation:

- Use caution when passing a hydrant that is in your direction of travel and close to the fire building in an attempt to get a closer one.

2. The initial attack line selected on side Alpha was 200' 1 ¾ inch constant flow nozzle set at 95 GPM. The backup line was a 200' 1 ¾ inch constant flow nozzle set at 95 GPM. The backup line was directed into a window to the right of the entrance door.

Discussion: As delineated in Baltimore County Tactical Operations Manual #08, the 2nd arriving engine “shall advance a backup line”. This was consistent with the SOP. The SOP also allows for the flexibility of this line to be directed by Command to “another route of access.” There were no back-up lines in the initial entry point consequently, the first attack crew operated for an extended time with no protection for their egress.

Recommendations:

- Consider having the initial backup line proceeding into the same point of entry as the initial crew operating in the IDLH environment. Doing this allows for the line to also aid in protecting the common stairwell (i.e. fire extension/protection for egress). Deploy a third line if needed into another point of access.
- Consider dialing nozzles up to higher gallons per minute for large structures such as apartment buildings.
- Consider utilizing a 2 1/2” attack line for fire attack.

3. E-11’s initial mode of operation quickly went to “Rescue” and Command radioed that he would be assuming “Limited Command”

Discussion: Shortly after the first rescue was made, Command felt that things were manageable and that he could retain Command, however, this was not relayed. E-10 (2nd engine arriving) did not assume Command; he did a face to face with Command and was told to pull a second line. The current SOP does allow for the flexibility to assume Command again after the Incident Commander calls “Limited

Command". Furthermore, the current SOP states in Tactical Operations Manual #07 Section 2.2 6.:

The Limited Command mode should not last for more than a few minutes and will end with one of the following:

- a. Situation is stabilized.
- b. Situation is not stabilized and the Officer must withdraw to the exterior and establish a Command post.
- c. Command is transferred to another Company Officer.
- d. Command is transferred to an arriving superior officer.

Recommendations:

- The current SOP should be modified to state that when the initial Incident Commander feels that the incident has stabilized to a point where there is no longer a need for him/her to be directly involved with incident operations, a notification through Dispatch shall be made to inform crews on and en route to the scene.
- The Department should develop training to ensure that Incident Commanders relay changes in modes of operations.

4. Decision to attack from side Alpha was made.

Discussion: The fire was located in the terrace apartment which was partially below grade. E-11's crew had difficulty making progress down the common stairwell steps due to high heat and smoke conditions. During Command's initial 360°, fire was emanating from side Charlie of the fire apartment.

Recommendation:

- Consider attacking fires from other sides of the structure that are on grade.

5. Compartmentalization of rooms

Discussion: During interior suppression/rescue operations, crews moved within the structure from apartment to apartment creating additional paths for potential fire spread. The investigation also indicated that height of the carpet prevented the self-closure mechanism of the doors to operate properly.

Recommendation:

- Consider the use of “door control” for protection during search and rescue and exposure protection.

6. 2nd arriving engine E-10

Upon arrival, E-10 laid the initial supply line from a hydrant at Deanwood and Dowling. Their crew deployed a backup line into the window to the right of the front door.

Discussion: E-10’s OIC did a face to face with Command and was told to pull a second line to back up the initial crew. The decision was made to put the line into the window to the right of the door. At this point, the OIC of E-10 went in to assist E-11’s crew with advancing the initial line.

Recommendations:

- When deviations to initial orders are made, they must be communicated to Command. In this instance, E-10’s crew chose to advance the back-up line to the window adjacent to the front door, instead of going through the initial point of entry.
- IC should consider setting up a division supervisor with the first arriving officer to balance his/her span of control early into the incident.

7. 3rd arriving engine E-1

E-1 completed the initial supply line at Deanwood and Dowling. The officer and crew then took a ladder to side Charlie went to the third floor and began

search and rescue operations. While doing search and rescue on the third division, no lines were requested or deployed to support the operations.

Discussion: It is important that the Incident Commander be given a continuous flow of information. Upon arrival of initial units, it was soon evident that the bulk of the fire was on side Charlie. After the initial 360° size up, Command should request and receive progress reports from division supervisors. In the absence of this, an officer aware of information relative to the incident should relay that to Command.

Recommendations:

- Command should initiate group and division supervisors early into an incident and use them to reduce his/her span of control. Communicate Conditions, Actions, Needs (CAN) reports early and often.
- When units are the initial crews deployed to a geographic location, consideration should be given to “prompt” Command to make them a division supervisor (in the absence of direction from Command).
- Units should request resources, or supply their own as necessary, to support the operations that they are undertaking.

8. 4th arriving engine E-292

E-292 was the fourth arriving engine on the fire ground and performed a split lay to side Charlie. The Incident Commander set them up as side Charlie. There they utilized a 1 3/4” hand line and proceeded to knock down the fire that was extending to the second floor balcony. Shortly after knocking down the fire, the officer and crew advanced the hand line into the fire apartment and began attacking the fire.

Discussion: To effectively achieve the strategic priorities on this incident, it is important to have effective and clear direction from Command. When the Incident

Commander assigns a responsibility, this must be adhered to. Any deviation from this responsibility must be relayed to Command. There was a face to face meeting that occurred between the Officer-In-Charge of E-292 and Command; however there was confusion as to what orders were to be carried out. As this operation on side Charlie was happening, the IC knew that E-11's crew was having difficulty making entry into the stairwell and down the front steps. It is unclear whether the IC gave orders to push into the fire apartment from side Charlie.

Recommendations:

- When given a division assignment, “step back”, take in the overall picture and communicate progress reports to Command.
- Be clear and concise when setting up division assignments.
- Utilize the division supervisors for incident operations once assigned.

9. 1st Truck (T-1)

T-1 positioned on side Alpha of the structure and threw ladders to the second floor. From there they initiated search and rescue operations.

Discussion: In the course of search and rescue operations, ventilation was completed on 2nd floor Alpha/ Delta apartment, Apt. A-2. While performing rescues, interior doors were used to cut off fire progression and allow time for the removal of victim #2.

Recommendations:

- Training on effective use of interior doors to control fire spread should be promoted throughout the department.
- Consider removing common stairwell windows earlier in fire ground operations when appropriate.

10. 2nd Truck (T-8)

T-8 positioned on side Charlie and began search and rescue operations on the second floor Charlie/Bravo apartment, Apt. A-1.

Discussion: After searching this apartment, T-8's crew made their way to the second floor, Charlie/Delta apartment, Apt. A-2, to begin a search. While there, they noticed a fire in the corner of the apartment shortly before coming across victim #3. While removing victim #3, the room reached its ignition point and flashed as they were exiting the apartment.

Recommendation:

- While performing operations above the fire, notify Command of changing conditions, and immediately request resources to support your function.

11. Squad 303

S-303 positioned on side Alpha and entered the building through the front door.

Discussion: They were not able to locate Command, so they deployed themselves to search and rescue. They split their crew at the front door and sent one member downstairs to assist with the hand line on the first floor apartment. One member did not enter the building. The remaining two members deployed to the second floor to assist with search and rescue operations, communicated with Command, and then proceeded to the third floor to begin search and rescue.

Recommendations:

- IC should set up a command post early into the incident
- Notify Command when entering an IDLH
- Request resources to support functions.

12. Overall Strategy

The initial strategy was life safety. Shortly after crews arrived, a civilian was seen on the third floor, side Alpha in the window. Crew accounts stated that the woman was threatening to jump and they were unable to convince her to wait. Because of this, efforts of incoming companies were focused on Search and Rescue. This took resources away from the other priorities of Ventilation, Containment and Extinguishment. After the initial rescue, units which would be utilized in other strategic priorities were faced with the additional rescue of two civilians. Before units could be redeployed to accomplish other objectives, they again were faced with a search and rescue operation of Firefighter Falkenhan. Some horizontal ventilation was done by companies in the course of doing search and rescue operations. Vertical ventilation was done later into the incident. There were no accounts of hydraulic ventilation done during operations.

Discussion: While being paramount to fire ground operations, the strategic priority of Life Safety can be accomplished in many ways. While there is no one perfect solution, there should also be consideration of fire containment and extinguishment to accomplish this priority.

In this operation, there were multiple crews performing search and rescue operations on all three floors of the apartment. For the majority of time, there were hand lines on the Terrace level only.

Recommendations:

- Set up divisions and groups early to aid in managing the strategic priorities.
- Set up a command post as early as possible to aid in deploying and accounting for resources as they arrive on the fire ground.
- Be clear in communicating strategy and tactics to companies involved in operations.

- Command should make it a priority to deploy attack lines on all floors to support the operations of crews working in the area.

Communications

Baltimore County Fire Department's Tactical Operations Manual #07, Section 5.2 acknowledges that effective communication is paramount to the safety and effectiveness of emergency scene operations. Section 5.1 of the same SOP states that effective incident scene communications are the responsibility of Command, although it is understood that Dispatch personnel and all personnel on the fireground have a role to play in ensuring that radio communications are brief, clear, concise, and that proper radio discipline is maintained.

System Overview

At the time of this incident, Baltimore County operated a Motorola 800 MHz Trunked Smartnet II radio system for public safety agencies. The transmission network was comprised of nine (9) tower sites located throughout the county. The Fire Department had two hundred eighty-four (284) Motorola XTL 5000 mobile and seven hundred sixty-five (765) STX portable radios. Radios were analog/digital capable (and still are). The Zone channel configuration consisted of over one hundred fifteen (115) talk groups, of which ninety (90) were designated for tactical use.

In February 2012, Baltimore County converted the radio system to an APCO P25 Phase I FDMA compliant Motorola Astro 25 800 MHz radio system utilizing eighteen (18) tower sites. Radios on the new system are 800 and 700 MHz capable. Talk groups have increased to one hundred-forty (140) with ninety-eight (98) available for tactical use.

Mutual aid communications with surrounding jurisdictions is accomplished by sharing system keys and programming mutual aid talk groups into the radios. The majority of mutual aid partners are also Motorola 800 MHz users.

Findings

1. As the incident progressed, radio noise caused by simultaneous radio transmissions hampered communications on the fireground.

Discussion: As the incident progressed, radio communications became increasingly difficult as the radio system became overburdened by simultaneous radio transmissions. It is believed that a majority of these transmissions were the result of an inadvertent activation (key-up) of the push-to-talk (PTT) button on either the speaker microphone or the radio itself. It is not known whether these accidental key-ups were performed by personnel on the fireground, personnel listening to the incident on portable radios at stations not involved with the incident, or by our mutual aid partners in the surrounding jurisdictions. The PTT log file generated at Dispatch that recorded the radio identification of all radios transmitting on the fireground talk group during the incident was deleted twenty four hours after the incident, per Dispatch policy. Although the PTT log data was available to Dispatch personnel at the time of the incident, it was unavailable for the purpose of this investigation.

Recommendations:

- A rubberized cover for the radio speaker microphone should be tested by Communications and field personnel. This device will cover the push-to-talk (PTT) button and will increase the pressure required for activation. If proved effective, this cover will decrease the likelihood of an accidental activation of the PTT button during vigorous fire ground activity.
- Continuing study should occur to evaluate methods to control inadvertent radio interference from all units (on the scene, responding, or monitoring) during incident operations. Review PTT logs to identify sources of communications interference.

- As a result of this investigation, PTT log files will be saved for 25 days.
- Fire communications and field personnel will develop and distribute a mandatory training program outlining proper radio procedures including the importance of radio discipline, MAYDAY procedures, and the procedure for establishing a command restricted talk group during critical operations.
- All personnel engaged in operations in an environment immediately dangerous to life and health should carry a portable radio.
- The aforementioned mandatory training program shall stress the importance of giving regular updates to Command regarding the extent and location of the fire and other pertinent information.

2. On several occasions the radio system was burdened by routine radio transmissions while urgent transmissions went unanswered.

Discussion: While the officer on T-8 repeatedly attempted to notify Command of the rescue of a resident from the second floor Delta apartment (A-2), personnel from E-292, E-302, E-17, and E-8 continued to make routine radio transmissions, even after the officer on T-8 identified his radio transmission as “urgent”. The term “urgent” is defined in Baltimore County Fire Department’s Tactical Operations Manual #07, Appendix B: Glossary of Radio Terms, as a term used to “preface a message of critical importance”. These routine radio transmissions prevented the officer on T-8 from giving vital information to Command in a timely manner.

Approximately two minutes after the MAYDAY was announced by Dispatch and talk group 1-2 became Command restricted, division 3 made a radio transmission requesting that E-292 shut down a 3-inch line. Baltimore County Fire Department’s Tactical Operations Manual #07, Section 5.2 Command Restricted

Talk Groups states, “When initiated, ALL RADIO TRANSMISSIONS on a Command Restricted Talk Group will be limited to the Incident Commander, the crew(s) actively participating in incident operational activities, and Fire Dispatch. All other radio transmissions will be prohibited.”

Recommendation:

- Fire Communications and field personnel will develop and distribute a mandatory training program outlining proper radio procedures including the importance of radio discipline, MAYDAY procedures, and the procedure for establishing a Command restricted talk group during critical operations.

3. Firefighter Falkenhan’s partner was not carrying a portable radio while engaged in interior operations.

Discussion: Without a portable radio, Firefighter Falkenhan’s partner was unable to advise Command as to the deteriorating fire conditions and was forced to wave to personnel on the ground on side Alpha from a third story window to effect his own rescue. He was also unaware that his partner was in trouble until informed so by personnel on side Alpha. A portable radio was available for his use on S-303.

Recommendation:

- All personnel engaged in operations in an environment immediately dangerous to life and health should carry a portable radio

4. Division supervisors and crew leaders did not provide adequate feedback to Command as to the extent and location of the fire, preventing Command from establishing effective strategy and tactics.

Discussion: Several crews searched the second floor, Delta side apartment (A-2) and rescued residents. No crews advised Command that fire was present in that apartment.

Recommendation:

- The aforementioned mandatory training program shall stress the importance of giving regular updates to Command regarding the extent and location of the fire and other pertinent information.

Training

In addition to the below listed certifications, FF Mark Falkenhan was trained to NFPA Firefighter III and was also a National Registry Paramedic.

Certifications verified by the Maryland Fire Service Personnel Qualifications Board:

Certification	Date Certified	Standard
Confined Space Rescue Technician	1/29/10	1006-2003
Fire Instructor II	1/29/10	1041-2007
Fire Instructor III	1/29/10	1041-2007
Haz-Mat First Responder-Awareness level	10/29/09	472-2002
Haz-Mat First Responder-Core Operational level	10/29/09	472-2002
Haz-Mat Incident Commander	1/29/10	472-2008
Haz-Mat Technician	10/29/09	472-2002
Health and Safety Officer	1/29/10	1521-2008
Incident Safety Officer	1/29/10	1521-2008
Incident Safety Officer for EMS Operations	1/29/10	1521-2008
Incident Safety Officer for Fire Suppression	1/29/10	1521-2008
Incident Safety Officer for Haz-Mat Operations	1/29/10	1521-2008
Incident Safety Officer for Technical Rescue	1/29/10	1521-2008
Rope Rescue Technician	1/29/10	1006-2003
Structural Collapse Technician	1/29/10	1006-2003
Vehicle and Machinery Technician	1/29/10	1006-2000

Appendices

Reference of Abbreviations	A
ATF Fire Model	B
SOP Personnel 16 Line of Duty Death/Life Threatening Injury/Funeral Policy.....	C
Tactical SOP 07 Incident Command System	D
Tactical SOP 08 Fireground Operations.....	E
Tactical SOP 09 MAYDAY Procedures	F
Tactical SOP 18 Rapid Intervention Team.....	G
NIOSH report on SCBA	H
NIOSH report on turnout gear/PPE (will be inserted when received)	I
Consolidated list of recommendations	J
Building photo showing floor designations	K
Map showing sides Alpha, Bravo, Charlie, and Delta	L
Area maps (2)	M
Reference photos	N
Detailed Radio Transmissions	O