

October 17, 2020

# 30 Miller Circle Explosion & Fire After Action Report



Prepared by Stephen Morris, Deputy Chief  
Harrisonburg Fire Department  
2/17/2021

# Table of Contents

INTRODUCTION .....	2
Incident Overview .....	2
Objectives & Goals of Review .....	2
Agencies/Departments Involved .....	2
INCIDENT OVERVIEW .....	5
Incident Location.....	5
Incident Dispatch .....	6
Initial Actions & Benchmarks .....	6
Timeline.....	9
Incident Management.....	10
Resources.....	12
Investigation.....	13
INCIDENT ANALYSIS .....	14
Procedures .....	14
Training .....	15
Performance Feedback .....	16
CONCLUSION.....	22

# INTRODUCTION

## Incident Overview

On October 17, 2020, at approximately 8:29 a.m., an explosion occurred at 30 Miller Circle in the City of Harrisonburg, VA. The explosion resulted in injury to five persons, two of whom were transported to the regional trauma center. The building suffered severe damage and was on fire upon arrival of emergency crews. This was the most devastating gas explosion in the City since 1947, which killed 11 citizens.

This report details the Harrisonburg Fire Department's (HFD) response to the incident and examines HFD's and its mutual aid agencies preparedness and response to an incident of this type. The intent of this After-Action Report (AAR) is also to provide guidance and recommendations for service delivery improvement for all agencies involved and the greater fire service.

The men and women of the Harrisonburg Fire Department, City of Harrisonburg, and their mutual aid agencies, demonstrated professionalism, dedication, and teamwork in response to the 30 Miller Circle explosion and fire. Their actions demonstrated a commitment to excellence while working as a cohesive team to ensure the safety of responders and the community.

## Objectives & Goals of Review

The primary goal of this AAR is to assess the performance of all agencies involved through a constructive analysis of incident operations while identifying areas for improvement and presenting actionable steps to adopt recommendations. Ultimately, our goal is to improve our preparedness for the next emergency through a combination of enhanced prevention and mitigation strategies for the benefit of those we serve.

## Agencies/Departments Involved

### Harrisonburg Fire Department

The Harrisonburg Fire Department (HFD) is a career department with a Class 2 ISO rating and, at the time of the incident, staffed by 100 employees across three divisions: Administration, Suppression, and Community Risk Reduction. The Suppression division is divided into three shifts (A, B, & C) with 23 personnel assigned to each shift. They staff four fire engines, one tower ladder, one battalion chief, and multiple support vehicles to include a hazardous materials unit and technical rescue unit. Minimum daily suppression staffing is 17 personnel. Each company is supervised by a lieutenant or captain, with a battalion chief supervising the shift.

Administration of the Department consists of a Fire Chief, two Deputy Chiefs (one vacant at time of incident), one Emergency Medical Services (EMS) Officer, one Administrative Officer (Deputy Emergency Management Coordinator – EM1) and one part-time Assistant to the Fire Chief. The Fire Chief and Deputy Chiefs serve as the on-call duty officer on a rotational basis. The Community Risk Reduction division is supervised by a Deputy Fire Marshal (Battalion Chief)

and is staffed with a Captain (Assistant Fire Marshal), Fire Inspector/Investigator, Lieutenant of Public Education, a Prevention Education Specialist (vacant at time of incident), and a child safety seat technician. The HFD is home of the Virginia Division 2 Regional Heavy Technical Rescue (HTR) team<sup>1</sup> and the Virginia Department of Emergency Management (VDEM) regional Hazardous Materials team. The HFD is also part of the regional Unmanned Aerial Vehicle (UAV) team in conjunction with Harrisonburg Police Department (HPD) and Rockingham County Fire Rescue (RCFR).

HFD serves a population of approximately 54,000 people within city limits of 17.42 square miles. In addition, the City of Harrisonburg is home to two universities: James Madison University with approximately 25,000 students, and Eastern Mennonite University, with approximately 1,500 students.

In 2019, HFD responded to 5,721 calls for service. Responses were in the following categories: 59% - EMS, 9% - Fire or hazardous condition related, 26% - Alarm Activations and the remaining 6% - Other, such as public service calls. The Fire Department is the designated provider of EMS in the City.

### Harrisonburg Rescue Squad

The Harrisonburg Rescue Squad (HRS) is an all-volunteer organization that provides emergency medical response and transport to the City of Harrisonburg and portions of Rockingham County. HRS has approximately 200 volunteers that staff units on a rotating schedule to answer nearly 9000 calls for service annually. The organization's fleet includes nine ambulances and multiple support vehicles, including a heavy rescue squad. HRS operates under a Memorandum of Understanding to provide EMS transport services for the City and is required to maintain minimum staffing of two ambulances 24 hours per day.

### Rockingham County Fire Rescue

Rockingham County Fire Rescue (RCFR) is a volunteer/career combination organization that staffs 10 fire stations and seven rescue squad stations. They provide career staffing in various configurations to supplement volunteer stations: three fire stations are staffed 24 hours daily; three rescue squad stations are staffed 24 hours daily; five fire stations are staffed 12 hours Monday through Friday; and three rescue squad stations are staffed 12 hours Monday through Friday.

The department is staffed with 85 full-time fire/EMS providers, 25 part-time fire/EMS providers and approximately 530 fire/EMS volunteers.

### Harrisonburg-Rockingham Emergency Communications Center

The Harrisonburg-Rockingham Emergency Communications Center (HRECC) is a multi-disciplined 9-1-1 center that is staffed with 52 employees. They are the designated Public Safety

---

<sup>1</sup> The Division 2 HTR team is a state-sponsored regional technical rescue asset with staffing from HFD, RCFR, Augusta County Fire Rescue, Waynesboro Fire Department and Staunton Fire Rescue. On this incident, all five jurisdictions provided personnel.

Answering Point (PSAP) for the City of Harrisonburg and Rockingham County. They provide service to nine law enforcement agencies, 19 fire departments and 12 rescue squads. In 2019, the Center dispatched over 123,000 calls for service. Typical daily staffing in the HRECC is seven (7) personnel.

### Harrisonburg Police Department

The Harrisonburg Police Department (HPD) has over 130 employees, 112 of whom are sworn officers that are focused on keeping Harrisonburg safe through a community policing model. The department is divided into four divisions: Patrol Operations, Special Operations, Criminal Investigations, and Administrative. The command staff for HPD consist of a Police Chief, Deputy Chief (currently vacant) and 3 bureau commanders.

### Harrisonburg Public Works Department

The Harrisonburg Public Works Department (HPW) and its over 100 employees are responsible for developing and maintaining the City's infrastructure, including roads and buildings. They are tasked with stormwater management and many of the City's environmental initiatives. They are a main resource for much of the City's heavy equipment such as dump trucks, tractors, and excavators.

### Harrisonburg Public Utilities

The Harrisonburg Public Utilities Department (HPU) has more than 50 employees that provide water and sewer services to the City of Harrisonburg and a small segment in neighboring Rockingham County. They provide water for everyday use as well as for fire protection through the City's municipal water distribution system.

### Harrisonburg Community Development

The Harrisonburg Department of Community Development is responsible for administering Planning, Zoning, and the Comprehensive Plan for the City. The Engineering Division provides services in engineering, surveying, geographic information systems, stormwater management, and erosion and sediment control. The Building Inspections Division provides applicable permits and inspections to ensure building and construction adherence to local and state ordinances and codes.

### Harrisonburg Economic Development

The Harrisonburg Department of Economic Development assists businesses in creating jobs and stimulate investment to the City. They offer site selection services, technical assistance, incentive programs, and regulatory guidance. Additionally, the department connects businesses with other state, federal and private resources that can help start or grow a business.

### Harrisonburg Information Technology

The Harrisonburg Information Technology (IT) Department ensures the City is leveraging technology that effectively serve its customers, through a stable and secure infrastructure. They provide customers with access to appropriate information through technology.



# INCIDENT OVERVIEW

## Incident Location

30 Miller Circle Harrisonburg, VA 22801



FIGURE 1 - 30 MILLER CIRCLE WITH SENSE OF PROXIMITY TO FIRE STATION #1

## Incident Dispatch

At 8:29:05 on October 17, 2020, Engine 23, Engine 408 (RCFR), Engine 28, Engine 26, Tower 1, Battalion 4, and Ambulance 44 were dispatched for an explosion at 242 East Water Street in the City of Harrisonburg. Note: HRECC received numerous calls reporting an explosion, with the first call originating from this address. It was quickly determined that this was not the location of the incident (confirmed by BC4 and Chief 1) and units were re-routed to the correct location near 1580 South Main Street at the intersection with Miller Circle. This occurred as soon as the dispatch was complete, and units did not have to alter their route of travel.

## Initial Actions & Benchmarks

### Initial Actions

Engine 28 arrived on scene to find a strip mall that appeared to have exploded and was well involved in fire, with multiple victims down on the ground. Engine 28's officer established command while the crew began fire attack with hand lines. Patient triage and treatment was assigned to Tower 1, which arrived on scene immediately behind Engine 28. The driver of Engine 28, a medic firefighter, was reassigned to assist with patient care and a firefighter from Tower 1 was reassigned to pump Engine 28. Access to the first due water supply (located in the cul-de-sac beyond the explosion site) was hampered by the debris field from the explosion. Engine 28 was unable to position near the hydrant resulting in a supply hose that had to be hand laid through the debris field to the fire hydrant approximately 300 feet East of Engine 28's position.



**FIGURE 2 – INITIAL SEARCH AND SUPPRESSION OPERATIONS**

Enroute, Battalion 4 requested a 2<sup>nd</sup> alarm and mass casualty incident (MCI). EM1 arrived and upgraded the MCI request to a Level II MCI response. Chief 1 arrived at 08:32 and assumed command, confirming the MCI and 2<sup>nd</sup> alarm request, with the addition of two medevac helicopters to respond to the local hospital (Sentara Rockingham Memorial Hospital - SRMH). Upon Battalion 4's arrival, his vehicle was used to establish the Incident Command Post (ICP)



and he became the command aide assisting Chief 1. Chief 2 arrived at 08:34 and was assigned Fire Branch Director while EM1 was assigned Medical Branch Director. Shortly after establishing branches, the incident was upgraded to a 3<sup>rd</sup> alarm due to the fire suppression operations and the need to conduct an extensive search of the debris field and structure. The significant damage to the structure would require extensive personnel to remove structural building material and complete a grid style search.

The Medical Branch triaged and treated a total of five patients. Four patients were transported via ambulance: two were taken to SRMH and two were transferred to AirCare medevac helicopters. The two patients transferred to Air Care were located inside the building at the time of the explosion. Both were flown to the University of Virginia Trauma Center. A fifth patient was treated at the scene.

Unable to verify all occupants were out of the building, search and fire suppression operations were conducted simultaneously. The portion of the building on the East side of the incident was deemed unsafe to enter. With unknown occupancy, the Division 2 HTR team was requested to respond and evaluate the structure for potential shoring operations to allow for a complete primary and secondary search. The team was also used to evaluate other businesses in the blast zone for possible victims and structural integrity.

Multiple large fire streams were used to control the fire in the remaining debris and structure. An uncontrolled gas-fed fire was identified on side Charlie (the back of the building). Columbia Gas was requested to the scene. The gas-fed fire was permitted to remain burning with a protective fire hose line in place while fire suppression operations focused on the remaining structure.



**FIGURE 3 - CREWS PERFORMING SUPPRESSION OPERATIONS**



After evaluation by the HTR team and City building inspector, the original building was deemed to be structurally unsafe for shoring operations. Concurrently, HPD verified that all business owners and staff were accounted for. Interior primary search operations were terminated due to considerable risk. An exterior search with thermal imaging cameras from an aerial apparatus was conducted and confirmed negative findings for a primary search. Search of other businesses in the immediate vicinity of the explosion were conducted to confirm no other patients.<sup>2</sup>

At this point, fire suppression operations continued. Heavy equipment (provided by the City Public Works Department) were utilized to render the remaining structure safe from further collapse hazard.

## Benchmarks

During response to the explosion the IC and staff identified the following benchmarks for mitigating the incident which involved an explosion, gas leak, fire, multiple injuries, a debris field, and damage to numerous structures.

- Safety of the responders and community
- Patient triage, treatment, and transport
- Incident stabilization
  - Secure gas leak
  - Search and rescue
  - Fire suppression
  - Building stabilization
- Dissemination of information to the public
- Scene security
- Investigation

---

<sup>2</sup> As part of a secondary search, a cadaver K-9 from the District of Columbia Fire & EMS Department was brought to the scene and confirmed no casualties in the debris field.

## Timeline

Time	Fire/Rescue Response
8:29 a.m.	Engines 23, 408, 28, 26, Tower 1, Battalion 4 & Ambulance 44 dispatched for explosion at 242 East Water Street.
8:29 a.m.	Engine 28 updates incident location to area of Wendy's on South Main Street
8:32 a.m.	Engine 28 arrives on scene, size-up of a building exploded on fire with multiple people down
8:32 a.m.	Battalion 4 requests 2 <sup>nd</sup> alarm and mass casualty incident (MCI)
8:32 a.m.	Chief 1 assumes command and EM 1 requests a level 2 MCI response
8:34 a.m.	Chief 1 confirms 2 <sup>nd</sup> alarm and requests 2 medivacs to Sentara RMH; Request to have HPD shut down a three-block radius
8:36 a.m.	Fire and Medical Branches established with Chief 2 Fire Branch Director and EM1 Medical Branch Director
8:37 a.m.	Additional tactical channels requested for command channel (Tac 8) and medical branch (Tac 6); Fire branch on Tac 7; 3 <sup>rd</sup> alarm requested
8:44 a.m.	EM1 Patient update: one priority 1, two priority 2's, two priority 3's
8:47 a.m.	Gas-fed fire found on Bravo/Charlie. Training 1 appointed Staging Officer with Level II staging on South Main Street
8:48 a.m.	Public Works notified for street closures
8:49 a.m.	Columbia Gas requested to the scene
8:53 a.m.	Heavy equipment requested from Public Works to assist moving debris for search operations
8:55 a.m.	2 persons unaccounted from one of the businesses. Battalion Chief Werner o/l (reported to scene during callback) appointed Safety Officer
8:56 a.m.	Patients transported to SRMH & LZ
8:57 a.m.	Off duty call back requested
9:00 a.m.	Division 2 HTR team requested to the scene for potential building shoring operations
9:12 a.m.	Public Utilities, Public Works, and Harrisonburg Electric requested
9:13 a.m.	Rehab established in Wendy's parking lot; UAV (Drone) team requested
9:15 a.m.	Additional tactical channel (Tac 9) requested for HTR Team operations; Battalion Chief Allison assigned HTR Group Supervisor
9:23 a.m.	City Building Inspector requested
9:28 a.m.	Virginia Emergency Operations Center (VAEOC) notified, Virginia Department of Emergency Management (VDEM) representatives on scene
9:34 a.m.	Confirmation all known patients have been treated and/or transported
9:51 a.m.	Columbia Gas confirms natural gas shut off to the area
10:25 a.m.	Command advises fire contained and all known patients transported
11:00 a.m.	Confirmation all employees/owners accounted for
11:22 a.m.	Bike Shop, Dominos, Funky's Amusement Center & Wendy's declared unsafe structures
1:37 p.m.	Release Tac 6 & Tac 9

1:57 p.m.	Request for mass notification in two block radius requesting property owners to contact if have property damage
2:41 p.m.	Incident declared under control
3:26 p.m.	Release Tac 8
8:10 p.m.	Command Terminated

## Incident Management

HFD personnel followed the department’s Standard Operating Procedure (SOP) 3.1.10 NIMS & ICS Policy and the National Incident Management System. The following identify the person(s) that were assigned key functional position within the organization:

Initial Incident Commander: *Master Firefighter Tyler Burgoyne, Engine 28*

Incident Command (IC): *Fire Chief Matthew Tobia (C1)*

Command Aide/Liaison Officer: *Battalion Chief Jeff Rhodes (BC4)*

Fire Branch Director (later re-designated Operations Section):

Initial: *Deputy Fire Chief Stephen Morris (C2);*  
 Later: *Battalion Chief Jeff Morris (RCFR)*

Medical Branch Director: Initial: *Administrative Officer Paul Helmuth (EM1);*  
 Later: *Rescue Chief Matt Cronin (HRS)*

Staging Officer: *Training Officer Jody Quesenberry (TR1)*

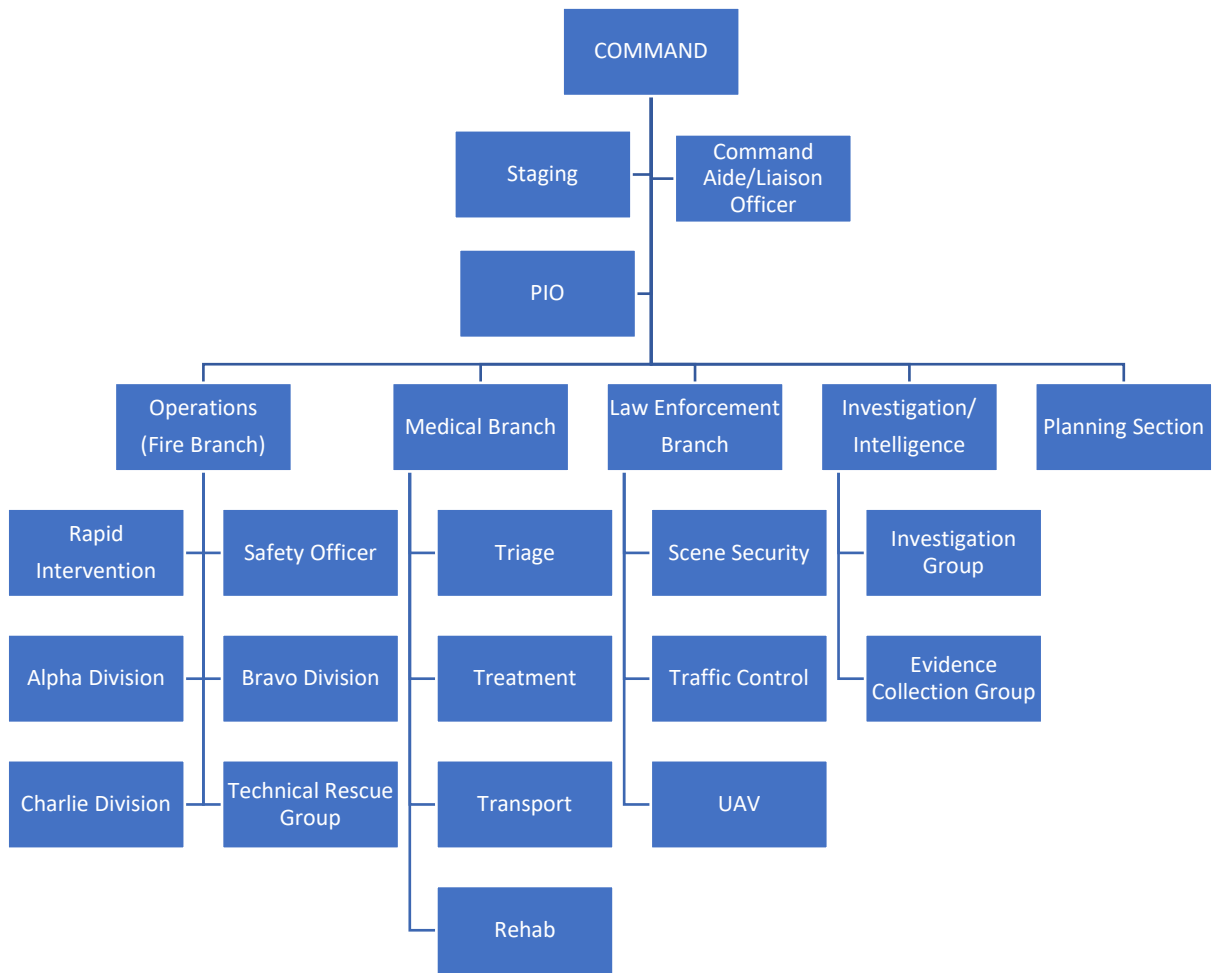
Public Information Officer: *Director of Communications Michael Parks (City Manager’s Office)*

Safety Officer: *Battalion Chief Larry Werner*

Law Enforcement Branch Director: *Captain Rod Pollard (HPD)/Sergeant Chris Terrell*

Investigation/Intelligence: *Deputy Fire Marshal Michael Armstrong (FM1)*

Planning Section: *Assistant to the Fire Chief Michael Brady/  
 Administrative Officer Paul Helmuth*



**FIGURE 4 - INCIDENT ORGANIZATIONAL STRUCTURE FOR THE 30 MILLER CIRCLE INCIDENT**



## Resources

Fire & Rescue			
1 <sup>st</sup> Alarm	2 <sup>nd</sup> Alarm	3 <sup>rd</sup> Alarm	Additional
Engine 23 (HFD)	Engine 25 (HFD)	Engine 203 (RCFR)	Fire Marshals 1, 2 & 3 (HFD)
Engine 408 (RCFR)	Engine 418 (RCFR)	Engine 506 (RCFR)	Regional UAV Team
Engine 28 (HFD)	Engine 54 (ACFR)	Engine 756 (RCFR)	Various Support Vehicles & Staff
Engine 26 (HFD)	Engine 174 (RCFR)	Engine 36 (RCFR)	Regional HTR Team
Tower 1 (HFD)	Truck 80 (RCFR)	Truck 15 (RCFR)	AirCare 5
Battalion 4 (HFD)	Tower 90 (RCFR)		AirCare 4
Battalion 94 (RCFR)	Rehab 40 (HRS)	Engine 654, move-up (RCFR)	Squad 41 (HRS) Heavy Rescue
Chief 1 (HFD)	Duty Officer 90 (RCFR)	Engine 182, move-up (ACFR)	Engine 402 (RCFR)
Chief 2 (HFD)	Ambulance 178 (RCFR)	Engine 107, move-up (RCFR)	Engine 108 (RCFR)
EM 1 (HFD)	Ambulance 48 (HRS)	Engine 22, upstaffed by off duty personnel (HFD)	
Ambulance 44 (HRS)	Ambulance 46 (HRS)		
Ambulance 45 (HRS)	Ambulance 47 (HRS)		

Additional Resources	
Harrisonburg Police Department	Harrisonburg Community Development (Building Inspectors)
James Madison University Police Department	Rockingham County Sheriff's Office
Harrisonburg Public Works	Columbia Gas
Harrisonburg Public Utilities	Monger Lumber
Harrisonburg Electric Commission	Virginia Department of Emergency Management
Harrisonburg City Manager's Office	Salvation Army
Harrisonburg Economic Development	Virginia State Police

Investigation Resources	
Harrisonburg Fire Marshal's Office	Virginia State Fire Marshal's Office
Harrisonburg Police Department	Shenandoah County Fire Marshal's Office
Rockingham County Fire Marshal's Office	Warren County Fire Marshal's Office
Bureau of Alcohol, Tobacco, Firearms & Explosives (ATF)	Staunton Fire Marshal's Office
HFD Swiftwater Team	Virginia Department of Forestry

## Investigation

The magnitude of the explosion coupled with the infrequency of responding to and investigating incidents of this type was quickly recognized. It was determined that it would be critical to begin and move through this phase in a purposeful, methodical manner to ensure a thorough investigation was conducted. The first 12-to-24 hours were utilized to develop a course of action for the investigation and ensure the safety of personnel. It was imperative that evidence or potential evidence was not destroyed. Crews operating on the emergency scene during the initial phases of operations were crucial in assisting with this. All personnel displayed an understanding as to the complexity of the situation and were observant of the scene and protected potential evidence as it was found.



**FIGURE 5 - INVESTIGATION ORGANIZATIONAL STRUCTURE FOR 30 MILLER CIRCLE**

The HFD Fire Marshal's Office (FMO) has limited experience with large-scale explosion investigations, therefore quickly requested assistance from the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF). Due to the complexity of the investigation, additional resources were requested from other local fire marshal offices, State Fire Marshal's Office, Virginia Department of Forestry, and specialty teams within HFD. Columbia Gas and the State Corporation Commission aided during the investigation.

Early in the incident, speculation and inaccurate information shared on social media platforms created a minor challenge. This was quickly overcome through the Public Information Officer

(PIO). Ensuring routine, timely and accurate information dissemination was critical in maintaining trust and restoring a sense of safety for the community.

As with many post-blast investigations, the first day was dedicated to securing and documenting evidence on the outer perimeter of the blast zone. HPD provided additional resources from the beginning of the incident throughout the investigation process to secure the scene, interview witnesses, obtain incident footage, and support other significant investigation activities. The on-scene investigation continued throughout Wednesday October 21, 2020 which provided investigators insight into the potential areas of gas leak and ignition.

Multiple government and private entities involved in the investigation (all with unique constituencies) cooperated with respect and professionalism. The HFD FMO has determined that the explosion and fire were the result of an accumulation of combustible natural gas inside the structure that found an ignition source inside the building. The investigation concluded with no evidence indicating that this was anything other than an unintentional event.



Figure 6 – UAV photo of debris field

## INCIDENT ANALYSIS

### Procedures

HFD's current policy *SOP 3.2.10 Gas Leak/Odor of Gas* provides direction for the safe and effective use of resources at incidents involving gas leaks or the odor of gas inside of a structure. The policy is designed to mitigate the situation while protecting the community and responders as much as possible. All HFD front-line apparatus are issued multi-gas meters that

are bump-tested<sup>3</sup> at the beginning of each shift. Even though this specific incident was not dispatched as an odor of gas within a structure, an explosion would have similar response considerations.

Per SOP, the first arriving engine is tasked with positioning the apparatus to reduce the potential for injury by staging a safe distance from the structure and considering a location not in the collapse zone. All companies responding activate their multi-gas meters while responding to ensure they are ready for use upon arrival. While wearing full protective equipment, including self-contained breathing apparatus (SCBA), the crew assists with evacuation of the structure while monitoring with the multi-gas meter. Restricting entry to the area or structure is accomplished using fire line tape, cones, or with assistance of law enforcement.

The following procedures are used if the meter detects percentages of the lower explosive limits (LEL) of a flammable or combustible gas. If 10%-25% of the LEL is found, the gas service to the structure is secured, fire suppression hand lines are placed in service, and the structure is ventilated; if 25% or greater of the LEL is found, the crew immediately evacuates the structure and area, but does not take offensive actions (e.g. ventilation). On all gas incidents, the responsible gas company is notified to respond. Re-entry to a structure or area with 25% or greater LEL is coordinated with the IC and gas company response personnel.

HFD's *SOP 3.1.14 Bomb Threats/Explosions/Bomb Detonations* provides additional guidance relating specifically to explosions. It provides direction for position of apparatus with consideration for patient care and transport in the event the incident has mass casualties. The procedures reinforce maintaining situational awareness regarding potential other explosive mechanisms while protecting the scene for investigation.

## Training

Safe and effective response to flammable and toxic gas incidents requires a well-trained responder with the right equipment. To this end, the HFD operates with a set of nine multi-gas meters (one per company plus reserve apparatus) capable of detecting a wide range of flammable and toxic gas hazards. Unlike what may be seen on television, the multi-gas meters will not identify an unknown gas; instead, these instruments provide data that must be interpreted by the user. Therefore, thorough, and continuous training is imperative.

All suppression personnel in the HFD are trained to a minimum of the Hazardous Materials Operations level. Many of our personnel have also completed Hazardous Materials Technician or Specialist certifications through the Virginia Department of Emergency Management (VDEM). Gas detection training begins at the Operations level and a responder's knowledge base is incrementally increased as they move upwards to Specialist. Once certified, all personnel at the Technician and Specialist levels are required to obtain 24 hours of annual refresher training. A significant part of this annual refresher training is dedicated to detection

---

<sup>3</sup> A bump test is a very brief exposure of a monitor to a gas to help verify that the sensors respond, and the alarms are functioning. A calibration is performed by exposing the monitor to a certified concentration of gas for a given time to help verify it provides an accurate reading.



and monitoring, a larger category that includes operation and interpretation of the Department's gas meters. In addition to classroom instruction, a large majority of HFD hazardous materials training is scenario-based, hands-on training. The department has a training system that permits simulated response to various gases in realistic fashions, and gas monitoring is part of many different training scenarios throughout the year.

The third component of any successful gas monitoring program (after equipment and training) is maintenance. The best gas meter with the smartest operator will be useless without proper maintenance. Within the HFD, six (6) personnel have completed training as factory certified instrument technicians. To ensure meters are ready for service at a moment's notice, these technicians oversee a robust maintenance and testing regimen that requires every meter be tested for proper operation at the beginning of each workday. By doing so, the HFD ensures that the meters are functioning according to manufacturer's recommendations thereby maximizing their effectiveness. Few fire departments emphasize the importance of gas monitoring policies that include meeting all manufacturer maintenance recommendations.

## Performance Feedback

### What went well?

1. Actions of the initial responding companies were strategic and implemented with precision. Acting Officer and initial Incident Commander (IC) Master Firefighter Tyler Burgoyne's calm communication set a professional tone as he approached a chaotic scene. As the incident expanded, utilization of multiple radio tactical channels allowed for more effective communications between the IC, HRECC and branch/division/group supervisors. The Incident Command System (ICS) utilizing the National Incident Management System (NIMS) model worked as designed in maintaining span of control. The value of using a NIMS-compliant ICS cannot be overstated. Although the incident did not develop into a type II or I level, had it done so, the ability to seamlessly integrate into a larger framework for incident management would have been critical. The regular practice of using a NIMS-compliant model on Type III, IV and V incidents is essential and should be continued.
2. The call-takers and dispatchers in the HRECC handled this incident with a tremendous level of professionalism. Between fielding numerous 9-1-1 calls, processing the initial dispatch, responding to requests for additional resources, and monitoring multiple tactical channels, the staff played a critical role in ensuring public safety and responder safety. This was done in addition to the normal call volume normally experienced by the HRECC. The on-duty staff for this incident distinguished themselves through their actions and are to be commended for a job extremely well done.
3. Inter-agency cooperation by emergency service agencies and other departments of the City government proved invaluable to the positive outcome of the incident. HRS fulfilled their mission as the primary EMS transport agency with efficiency and effectiveness by providing multiple transport units and remaining on location during the Day 1 Operational Period, ensuring rehab services for all responders. Mutual aid from RCFR

and surrounding jurisdictions reinforced the genuine commitment to inter-agency cooperation. The second and third alarm resources by mutual-aid partners were essential in stabilizing the incident quickly with a focus on responder and civilian safety. The utilization of the Division 2 HTR team similarly reinforced the commitment of the Central Shenandoah Valley Fire Chiefs to regional cooperation. The team rapidly assembled from across five jurisdictions and functioned to a very high degree of professionalism, despite infrequent opportunities for training in the presence of the current pandemic.

4. During a significant event, communication is crucial to ensuring the safety of the community by providing timely and accurate information. The City of Harrisonburg Communications Director Michael Parks (who served as the PIO throughout the event duration) did an outstanding job of managing communications from the scene to provide a steady and reliable flow of information from the IC and City Manager to the public. This role became more vital as the incident quickly gained national attention, concentrating a genuinely significant commitment of time, energy, and effort on one person.
5. Early in his response to the explosion, Deputy Fire Marshal Armstrong contacted HPU staff to make them aware of the circumstances. In doing so, HPU was able to ensure adequate water supply for fire suppression operations.
6. DPW Director Tom Hartman reported to the scene and remained on location for several hours, making certain requests for his Department's resources were reacted to in a timely manner. His support and engagement are herein gratefully acknowledged.
7. Several building inspectors from the City of Harrisonburg Community Development Building Inspections Division responded to the scene upon request. They were assigned to assist with damage assessment of buildings outside of the immediate blast site that were also affected by the explosion. This allowed fire and rescue personnel to focus on other higher priority incident benchmarks.
8. The Harrisonburg IT Department aided the PIO through monitoring various social media platforms to identify misinformation and persons with questions regarding the incident. They also established a hotline for citizens to report damage to their property related to the explosion, which allowed for better planning and understanding of the damage radius.
9. The blast site was located near a retail running shop that was coincidentally hosting a 10-miler running event when the explosion occurred. Many of the runners were affiliated with the James Madison University (JMU) ROTC program, contributing to a heightened concern about the nature of the blast. JMU administration staff, police and external communications personnel responded quickly, providing essential coordination to their constituencies. The positive working relationship between the City and JMU is an imperative for future preparedness efforts.

## What could have gone better?

1. Water supply was hampered for first-in responding units due to the debris field created by the explosion. Recognizing this, the initial incident commander requested the second-arriving engine establish a water supply. The officer of that engine (Engine 23) acknowledged the order and planned to reverse lay from Engine 28 to the hydrant at the end of the cul-de-sac, not realizing the road was impassable. Both officers were in possession of information that could have avoided the delay in establishing a primary water supply but, in the moment, did not fully communicate the need or the plan. As a result, there was a slight delay in establishing an initial water supply. The third- and fourth-arriving engines each brought an independent water supply from South Main Street and a supply line was also hand-laid from Engine 28 to the hydrant in the cul-de-sac.
2. In November 2019, a new Computer Aided Dispatch system (CAD) was implemented that includes a proximity dispatch feature based on GIS mapping. Due to the complexity of the incident, extensive radio traffic, and numerous incoming 9-1-1 phone calls, HRECC staff experienced a delay in dispatching the additional requested alarms. This created a circumstance where personnel responsible for cross-staffing mutual aid apparatus who heard the request for additional support, self-dispatched with apparatus based on historical knowledge of legacy assignments. As a result, units not due on the call responded and units needed for the call, while dispatched, did not respond. This created a situation where the incident had more ladder trucks and less engines than it should have otherwise had. Although it did not adversely impact the outcome, it did highlight an issue for regional chiefs to carefully review.
3. The initial attack line deployed from Engine 28 was one typically used to attack a fire in a residential structure (1 ¾"). Due to the magnitude of fire involvement, and the need to search the debris field under fire conditions, consideration of a larger hose line (2 ½") or portable master stream device (Blitzfire) could have potentially made a bigger impact. The selection of the first attack line was driven by muscle memory and it should be noted that the back-up line was a 2 ½" attack line, followed by a portable master stream appliance. This is a commonly occurring phenomenon characterized by reverting to unconscious action under stressful circumstances and has been documented in numerous AAR's, pointing to the need for continuous training and a conscious awareness of the challenges during large-scale incidents.
4. As noted earlier, the driver/operator of Engine 28 (1<sup>st</sup> arriving) is also a certified paramedic and, immediately upon arrival on scene, was re-assigned to assist with initial patient care and transport. The decision to allocate the driver/operator to a life-safety role was a judgement call. Another firefighter from Tower 1 immediately assumed the duties of operating the pump on Engine 28, resulting in no delay in fire attack.
5. Multiple law enforcement agencies responded simultaneously. The IC did not immediately identify the ranking HPD officer on location to relay incident priorities and objectives. As a result, there was a delay in defining and controlling the scene perimeter

and accounting for all civilians. This also created challenges for the lead investigator from the HFD, as well as instances of duplication of efforts by the law enforcement agencies on location.

6. Regional VDEM representatives reported to the scene. After checking in at the ICP, they did not have a clear mission beyond maintaining availability to handle resource requests for State or regional assets.
7. Due to early arrival on the incident scene (and expertise to perform the function) the HFD Administrative Officer (EM1) was assigned Medical Branch Director because of the potential of mass casualties. This delayed completing the Emergency Management functions he would have normally performed. Although it did not adversely impact the overall incident, this assignment did create a lag in relaying information to the State Emergency Operations Center (EOC) and other Emergency Management coordination functions. This highlights an area of potential growth for the HFD in the future implementation of an EMS Supervisor position.
8. The magnitude of the incident drew a limited number of first responders from outside the area who self-dispatched, reporting to the scene without authorization. Although well-intentioned, this type of action can be tremendously dangerous for the would-be responders and other personnel already operating on the incident. It also creates unmanageable accountability issues for the IC. The individuals were quickly identified and directed to the staging area where they remained.
9. Crews from HPW brought heavy equipment to remove debris from multiple areas on the emergency scene to facilitate search operations. While working on their designated assignment, there was confusion with other Division/Group supervisors that had not been informed of task allocation. This created some momentary delays in completing given responsibilities.
10. The City's Communication Director did an excellent job in disseminating information to the media and public. However, some duties were delayed due to fielding phone calls from national media, designating a media staging point, and directing on-scene media to the designated location. Additionally, City Council members did not know where to stage and await informational updates from the City Manager.

### How do we improve for the next time?

1. When the IC recognizes the potential for an emergency incident to be a multi-day event, consider requesting necessary components of a Type III Incident Management Team (IMT) from outside the region would greatly enhance personnel resources to provide augmented capacity and distribute workloads.

**Recommendation:** Create a major incident checklist for the IC to utilize during incidents that are expected to extend beyond the initial operational period (12 hours).

2. Some logistical items such as fencing, tents, portable toilets, etc. required additional time to locate and bring to the scene. Knowing which area businesses provide items that



are potentially needed for multiple operational periods would enhance the ability to have these items located and brought to the scene in a timelier manner.

**Recommendation:** In cooperation with Emergency Management and HRECC, develop a resource list for infrequently requested resources with corresponding points of contact. Require periodic (annual) updating of the resourcing list to ensure accuracy.

3. Emergency scene communications can be hectic at times however, it is crucial that personnel ensure the communication loop is complete and messages are received and understood. When providing assignments, unit officers and Division/Group supervisors must clearly identify which unit is being assigned the task. When given a task, units must verbalize that the assignment is understood. This will ensure assignments are not missed and that the overall mission is not jeopardized. Ensure that Branch Directors and/or Division/Group supervisors are aware of task assignments that may be working through their given area of control. Since multiple tactical channels were utilized in this incident, it could be advantageous for HRECC to verify dispatched and assigned units are functioning on the correct channel through a rollcall procedure.

**Recommendation:** Closed-loop communication using an accepted model (e.g. Connect, Convey, Clarify and Confirm) should be made a part of every emergency and non-emergency response and in every training activity, beginning with recruit training.

4. The annual certification of gas line integrity inside of structures and connections to their associated appliances is an area of consideration for the Fire Marshal's Office to evaluate. A possible solution is to require businesses to provide certification of inspection (like annual sprinkler tests) by a licensed technician. This is an opportunity to mitigate the likelihood of similar events occurring in the future.

**Recommendation:** Authorities Having Jurisdiction (AHJ) should determine if existing regulations adequately address the periodic inspection of natural and LP gas lines and appliances inside commercial, retail, and industrial properties subject to inspection. Depending on the outcome of the assessment, AHJ's should consider amending their regulations to strengthen the periodic inspection and testing of gas-fed appliances.

5. A comprehensive review of fire department training, practices and SOP's relating to response for odor of gas inside of structure and explosion calls would help to identify areas for improvement. One of those areas could be in developing benchmarks for incidents of this type and what actions should be taken to accomplish them (e.g. evacuation, search, hazard mitigation, ventilation).

**Recommendation:** Fire Departments should conduct research of previous emergency incidents involving natural and LP gas (fatal and non-fatal to responders), review existing SOP's from other departments, and develop specific policies commensurate with department capabilities. Considerations including staffing, response times, and water supply will impact action plans in different jurisdictions. Departments should develop SOP's that work for them in their community with a primary focus on responder and civilian safety.

6. When responding to incidents involving active fire and civilian injuries, consideration should be given to tasking the first-arriving company with establishing command, addressing water supply, and initiating fire suppression operations in support of search operations (i.e. deploying the first attack line). The proximity of fire apparatus within the City allows the IC to consider assigning medical triage and treatment to other units on the first alarm assignment. This will enhance continuity of operations for the first-arriving company. Although life safety is always the top priority, searching under active fire conditions is potentially more successful with the timely placement of an effective fire stream.

**Recommendation:** Conditions upon arrival at an emergency dictate the tactics employed to mitigate the incident. Given this well-founded belief, SOP's should be viewed as a playbook for successful outcomes with the understanding that circumstances may warrant changing the plan of attack in a unique situation. In those cases, the most important point is to communicate the change to all responding personnel. Notwithstanding, the re-assignment of personnel expecting to perform a specific function creates an opportunity for a critical step to be missed or delayed. Balancing risk vs. benefit in such circumstances weighs in favor of maintaining crew integrity whenever possible.

7. In November 2019, a new Computer Aided Dispatch system (CAD) was implemented that includes a proximity dispatch feature based on GIS mapping. Due to the complexity of the incident, extensive radio traffic, and numerous incoming 9-1-1 phone calls, HRECC staff experienced a delay in dispatching the additional requested alarms. This created a circumstance where personnel responsible for cross-staffing mutual aid apparatus who heard the request for additional support, self-dispatched with apparatus based on historical knowledge of legacy assignments. Proximity-based dispatching is important in ensuring the closest appropriate unit is sent to a call for service.

**Recommendation:** The Central Shenandoah Regional Fire Chiefs committee should carefully review the AAR and provide guidance to their respective department personnel concerning the need to a) respond when dispatched and b) respond with the dispatched apparatus. Broadly, Departments that implement proximity-based dispatching need to be cognizant of the changes that will occur in their jurisdictions including the erasure of "boundaries" and "first-due" areas.

8. When incidents involve a significant loss to the City's business community, establish and maintain communications with the Director of Economic Development and staff. This will ensure efficient documentation and allow Economic Development to identify possible means to assist with business recovery.

**Recommendation:** Establish crisis communication mass notification groups through the HRECC. Such groups could be established for a wide array of events including: the death or serious injury of a member of public safety; significant man-made or natural disaster affecting the entire jurisdiction; loss of critical infrastructure; and loss of technology

platforms. Secondly, create a back-up mechanism to effect similar communication in the event the HRECC cannot fulfill this function.

9. On large-scale incidents, the need for support staff to fill non-operational roles is essential. In this case, the Public Information section and Planning Section could have benefitted from additional support.

**Recommendation:** Identify administrative staff within City Government to assist the PIO with media and information release details. Work with the City Manager to develop a plan for ensuring information flow and safety of elected officials that may desire to be at the emergency scene. Develop dispatch, response and reporting protocols for administrative personnel, city officials and elected officials.

10. One of the key challenges in any man-made or natural disaster is to seamlessly integrate emergency mitigation activities designed to address the life safety and property conservation needs of a community with broader emergency management functions. At its core, emergency management is designed to support operational activities and focus on returning a community to “normalcy” as quickly as possible.

**Recommendation:** HFD will meet with the regional representatives from VDEM to clarify expectations, roles and responsibilities and ensure appropriate use of available resources. The City will begin exercising the Emergency Operations Center to include the identification and training of department-specific personnel with decision-making authority on behalf of their respective discipline.

## CONCLUSION

No emergency scene is ever perfect. Lessons are learned and reinforced. Programs are appropriately reviewed and revised, leading to a more comprehensive preparedness for the next emergency. In response to the explosion at 30 Miller Circle, HFD personnel along with numerous mutual aid agencies demonstrated tremendous professionalism and dedication to their mission while performing as one team. They performed their duties effectively and efficiently in providing essential patient care, fire suppression and hazard mitigation operations. The pre-established working relationships HFD has in place with HPD, RCFR, HRS, JMU and other intra-city agencies proved to be invaluable. It was evident that planning and training converged to ensure a seamless operation.

Of course, the incident was not without its own challenges. As on any emergency scene, it can be hectic and create communication challenges. One of the biggest lessons learned is how imperative closed loop communication is to enhancing safety during operations. This ensures crews operating on the incident receive needed information and that the information is understood.

The HFD has robust policies related to incidents involving natural or LP gas leaks and explosions that address a broad spectrum of safety concerns and emergency response. HFD will conduct a thorough evaluation of its policies and training programs regarding response to gas emergencies. To ensure a consistent and safe response, HFD will work with mutual aid agencies

regionally to ensure training and response protocols are consistent regionally. This includes partnering with Columbia Gas on developing training that can be delivered throughout the City and region.

HFD will work with HRECC and mutual aid agencies to better understand the newer proximity dispatch response assignments to ensure the appropriate units are being dispatched and responding to any given incident.

Incidents of this scale requiring multi-operational periods can be taxing on any department, especially a department the size of HFD. HFD will continue to train staff in various incident management functional areas. This in turn will help familiarize personnel with the various roles and responsibilities within multi-operational periods. Incidents that will have multi-operational periods will be evaluated to determine the need for assistance from an incident management team (IMT).

HFD has not responded to an incident involving a gas explosion of this magnitude since 1947, in which 11 people tragically lost their lives. Fortunately, and in no small part due to the preparedness and actions of numerous first responders, there was no loss of life at 30 Miller Circle on October 17, 2020. Through dedication to professionalism, training, and safety the Harrisonburg Fire Department, and their mutual aid partners, performed bravely and with diligence to mitigate this incident. The gas explosion will be used as a springboard to ensure more efficient and safe operations at incidents of this nature in the future. Ultimately, preparedness must also be matched with prevention and the Department will advocate for such action through its Community Risk Reduction division.

The Harrisonburg Fire Department is deeply indebted to the generations of chief officers, community leaders and appointed / elected officials who have provided appropriate staffing and equipment designed to ensure a fully prepared response agency. Such long-term commitments reflect the recognition that public safety is an essential function of local government.

[Intentionally Left Blank]