



# **FIREFIGHTER FATALITY INVESTIGATION**

**Fire Chief Hugh Ferguson  
Damon Volunteer Fire Department**

Investigation FFF FY 14-03  
Damon, Texas • April 21, 2014



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*The subsequent investigation of this incident provides valuable information to the fire service by examining the lessons learned, to prevent future loss of life and property.*

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## Executive Summary

On April 21, 2014, the Damon Volunteer Fire Department (VFD) responded to a vacant house fire. Fire Chief Hugh Ferguson was working to establish a water supply by dragging hose to a fire hydrant. While attempting to connect to the hydrant Chief Ferguson collapsed. Firefighters from the Damon VFD and the Needville VFD began CPR and he was flown to the Hermann Memorial Hospital in Houston where he passed away.

This report is intended to honor Fire Chief Hugh Ferguson by providing information of any lessons learned through the examination of this loss to prevent future firefighter injuries or deaths.



**Fire Chief Hugh Ferguson**  
Damon Volunteer Fire Department

# Introduction

On April 22, 2014, the Texas State Fire Marshal's Office (SFMO) received notification of the death of Damon Volunteer Fire Department Chief Hugh Ferguson.

The SFMO commenced the firefighter fatality investigation under the authority of Texas Government Code § 417.0075.

- (a) *In this section, the term "firefighter" includes an individual who performs fire suppression duties for a governmental entity or volunteer fire department.*
- (b) *If a firefighter dies in the line of duty or if the firefighter's death occurs in connection with an on-duty incident in this state, the state fire marshal shall investigate the circumstances surrounding the death of the firefighter, including any factors that may have contributed to the death of the firefighter.*
- (c) *In conducting an investigation under this section, the state fire marshal has the same powers as those granted to the state fire marshal under Section 417.007. The state fire marshal will coordinate the investigative efforts of local government officials and may enlist established fire service organizations and private entities to assist in the investigation.*
- (d) *The state fire marshal will release a report concerning an investigation conducted under this section on completion of the investigation.*
- (e) *Not later than October 31 of each year, the state fire marshal will deliver to the commissioner a detailed report about the findings of each investigation conducted under this section in the preceding year.*
- (g) *The authority granted to the state fire marshal under this section will not limit in any way the authority of the county or municipal fire marshal to conduct the county or municipal fire marshal's own investigation into the death of a firefighter within the county or municipal fire marshal's jurisdiction.*

The State Fire Marshal's Office activated the Firefighter Fatality Response Team to investigate the death of the Fire Chief and the origin and cause of the house fire.

# Firefighter Fatality Investigation

On April 21, 2014, the Damon VFD responded to a vacant house fire.

**11:01 p.m.** The Brazoria County 911 Center received a report of a house fire and the Damon Volunteer Fire Department was dispatched.

Brush 1, Engine 1, Tanker 1, and the Fire Chief responded to the fire scene. Brush 1 arrived first and positioned in a driveway across the street from the house fire. The front exterior and entry area of the house were involved in fire.

**11:11 p.m.** Engine 1 arrived at the front of the house facing Commerce Street and positioned in the street directly in front of the house. Mutual aid was requested.

Tanker 1 arrived and positioned on Woodward Street. The Tanker 1 driver established supply to Engine 1.



*View of the house from the intersection of Commerce and Woodward. (Google Earth)*

Firefighters made an initial exterior attack at the front entry area and exterior wall. Firefighters made entry through the front door and suppressed the fire in the living room, hallway, and bathroom. Chief Ferguson saw the heat and smoke continue to build above the ceiling area and ordered the firefighters to withdraw from the structure. Shortly



*View of front door area. (Google Earth)*

afterward, the interior of the house erupted in flames.

The fire ground operation continued in a defensive mode and the engine and tanker became low on water. Fire Chief Ferguson began to establish a water supply by dragging a 4-inch hose to a fire hydrant. The nearest hydrant was 300 feet south of the scene at the corner of Commerce Street and Mulcahy Avenue. Tanker 1 driver assisted in the hose drag until Chief Ferguson ordered him to connect the hose to Engine 1 and stand by for water. Chief Ferguson continued the hose drag to the hydrant, still approximately 250 feet distant. The Tanker 1 driver finished the connection and waited for water. The Tanker 1 driver radioed the Chief that the connection was made and he was ready for water, but he received no response.

**12:32 a.m.** After two or three more attempts on the radio a firefighter was sent to assist the Chief and he was found collapsed at the hydrant. Firefighters from the Damon VFD and the Needville VFD began cardio-pulmonary resuscitation immediately. A life flight helicopter dispatched to the scene flew Chief Ferguson to Hermann Memorial Hospital in Houston.

Medical staff were unable to resuscitate Chief Ferguson and he passed away.

An autopsy was performed by the Harris County Institute of Forensic Sciences. Cause of death was determined to be atherosclerotic and hypertensive cardiovascular disease. The autopsy revealed significant blockage of the arteries of the heart with 99 percent stenosis in two arteries, 50, 70, and 80 percent in three others. Contributing factors identified were diabetes mellitus and obesity. The manner of death was determined as Natural.



## Medical Background of Firefighter

Fire Chief Hugh Ferguson, 53, joined the Damon Volunteer Fire Department in 1993. Chief Ferguson had a history of high blood pressure and diabetes and was taking prescription medications. Family members were unaware of any cardiac disease.

Chief Ferguson began an exercise and weight loss program in December, 2013, and had lost approximately 40 pounds.

# Findings and Recommendations

*The State of Texas has adopted minimum training standards for paid fire departments. All fire department personnel should know and understand nationally recognized consensus standards, and all fire departments should create and maintain SOGs and SOPs to ensure effective, efficient, and safe firefighting operations.*

The Damon Volunteer Fire Department did not have an established fitness and wellness program for fire personnel.

There is no indication that the following recommendations would have prevented the death of Chief Ferguson; nevertheless, the State Fire Marshal's Office offers these recommendations to reduce the risk of heart attacks and sudden cardiac arrest among firefighters. All fire departments should be aware of the content of the following standards and are encouraged to develop programs based on them to increase the level of safety for fire department personnel.

Fire departments should consider adopting wellness and fitness programs modeled after the International Association of Fire Fighters<sup>1</sup>, International Association of Fire Chiefs<sup>2</sup> wellness-fitness initiative, the National Volunteer Fire Council<sup>3</sup>, and in accordance with *National Fire Protection Association Standards* including *NFPA 1500, Standard on Fire Department Occupational Safety and Health*; *NFPA 1582, Standard on Comprehensive Occupational Medical Program for Fire Departments*; and *NFPA 1583, Standard on Health-Related Fitness Programs for Fire Department Members*.

1. Consider mandatory pre-placement and annual medical evaluations for all firefighters, consistent with *NFPA 1582, Standard on Comprehensive Occupational Medical Program for Fire Departments*, to determine their medical ability to perform duties without presenting a significant risk to the safety and health of themselves or others.

<sup>1</sup> <http://www.nvfc.org/programs/heart-healthy-firefighter-program>

<sup>2</sup> <http://www.iafc.org/Programs/content.cfm?ItemNumber=1167>

<sup>3</sup> <http://www.iaff.org/HS/Well/wellness.html>

2. Consider an annual physical performance evaluation to ensure firefighters are physically capable of performing the essential job tasks of structural firefighting.
3. Ensure that firefighters are cleared for duty by a physician knowledgeable about the physical demands of firefighting, the personal protective equipment used by firefighters, and the various components of *NFPA 1582, Standard on Comprehensive Occupational Medicine Program for Fire Departments*.
4. Fire departments should establish physical performance requirements for firefighters and develop physical fitness programs. *NFPA 1583, Standard on Health-Related Fitness Programs for Fire Fighters*, is an excellent resource.
5. All Texas firefighters must complete a “Courage to be Safe” course, as adopted by the Texas Commission on Fire Protection and the State Firemen’s and Fire Marshals’ Association. The National Fallen Firefighters Foundation has developed a course that details “16 Firefighter Life Safety Initiatives” so Everyone Goes Home®<sup>4</sup>.

Many resources are available to assist fire departments and firefighters in providing information regarding firefighter fitness and establishing a fitness/wellness program. The following sites are just a few of many.

Heart-Healthy Firefighter Program, National Volunteer Fire Council.  
<http://www.nvfc.org/programs/heart-healthy-firefighter-program>

Heart attack is the leading cause of on-duty firefighter fatalities, accounting for around half of all firefighter deaths each year. The NVFC launched the Heart-Healthy Firefighter Program in 2003 to combat this alarming trend through education, awareness, and resources. The Heart-Healthy Firefighter Program promotes fitness, nutrition, and health awareness for all members of the fire and emergency services, both volunteer and career.

Resources available through the program include:

- Resources for starting and implementing a health and wellness program in your fire/EMS department.

<sup>4</sup> <http://www.lifesafetyinitiatives.com>

- Trade show booth with free health screening and resources.
- Health and Wellness Advocate Workshop to train department personnel to start a department health program and motivate their fellow responders to focus on health and fitness.
- Fired Up for Fitness Challenge, an interactive tool to motivate first responders to get active.
- Information on heart health, fitness, nutrition, and lifestyle choices.
- International Fire/EMS Safety and Health Week, held each June in partnership with the IAFC to encourage departments and personnel to focus on safety and health topics especially critical to the fire and emergency services.
- Health and wellness challenges to help motivate your department.
- Interactive message board to connect with other first responders looking to become and stay heart healthy.
- Webinars to educate first responders about important health and wellness topics.
- Securing Sponsors for Department Health and Wellness Programs, a toolkit for finding funding to support a wellness program in your department.
- Heart-Healthy Firefighter Resource Guide.
- Heart Healthy Firefighter Cookbook.
- Smoking cessation resources.
- Success stories from first responders from across the country who have succeeded in getting heart healthy.

Visit [www.healthy-firefighter.org](http://www.healthy-firefighter.org) to find the resources and tools to keep you and your department heart-strong and ready for the next call.

*U.S. Fire Administration Health and Wellness Guide for the Volunteer Fire and Emergency Services* FA-321/February 2009. [http://www.usfa.fema.gov/downloads/pdf/publications/fa\\_321.pdf](http://www.usfa.fema.gov/downloads/pdf/publications/fa_321.pdf)

NIOSH Alert: *Preventing Fire Fighter Fatalities Due To Heart Attacks And Other Sudden Cardiovascular Events*. NIOSH [2007]. <http://www.cdc.gov/niosh/docs/2007-133/>

*Firefighters And On-Duty Deaths From Coronary Heart Disease: A Case Control Study.*  
Environ Health: A Global Access Science Source. 2:14. <http://www.ehjournal.net/content/2/1/14>. Kales SN, Soteriades ES, Christoudias SG, Christiani DC [2003]

“Heart Disease And Firefighters: How And Why?” by John Hofman, 09/18/2012.  
<http://www.fireengineering.com/content/fe/en/articles/2012/09/heart-disease-and-firefighters-how-and-why.html>

“Recommendations for Reducing the Number of Line-of-Duty Deaths,” State Fire Marshal’s Office. <http://www.tdi.texas.gov/fire/fmloddprevent.html>

“Firefighter Health and Wellness Initiatives.”  
<http://firehouseexpo.com/z-pdf/2012/handouts/Firefighter-Health-and-Wellness-flyer-Bill-Troup.pdf>

“Does Your Fire Department Have A Health & Wellness Program?”  
*Fire Engineering*, 10/25/2012. <http://www.fireengineering.com/articles/2012/10/does-your-fire-department-have-a-health-wellness-program.html>

“Wellness And Fitness: Is It About Time For A Mandatory Program?” by Peter Bryan, 01/16/2013. <http://www.fireengineering.com/articles/2013/01/firefighter-wellness-and-fitness-is-it-about-time-for-a-mandator.html>

“Developing a Wellness Program,” by Michael Ong, 05/04/2011.  
<http://www.firefighternation.com/article/firefighter-fitness-health/developing-wellness-program>

# Appendix 1: State Fire Marshal Alert

*The following is a copy of a previous bulletin issued by the State Fire Marshal. It can be found on the State Fire Marshal's website at <http://www.tdi.texas.gov/fire/fmloddpresent.html>.*

The State Fire Marshal's Office has investigated more than 65 on-duty fatalities of firefighters in Texas since September 2001. These investigations have revealed some vital facts every Texas fire official needs to know.

Cardiovascular incidents, heart attacks, stroke, or related cardiac problems have caused 22 of the 65 deaths investigated through the end of fiscal year 2014. Of the 65 fatalities investigated, 21 fire ground related incidents resulted in 35 firefighter fatalities, 22 medical related incidents resulted in 19 heart attack and 3 cardiovascular (stroke) firefighter fatalities, and 8 motor vehicle accident related incidents resulted in 8 firefighter fatalities. Of the 35 fire ground related incidents, there were 5 multiple fatality incidents resulting in 20 firefighter fatalities (Houston - 4, West -10, Bryan - 2, Houston - 2, and Noonday - 2).

Every fire department (paid and volunteer), fire chief, and firefighter must take the initiative in reducing the number of on-duty heart attack deaths.

When it comes to physical fitness and overall health, every little bit of effort counts.

Extensive research has shown that you can improve your overall health, thus preventing disease and premature death, by making small adjustments and improvements in your daily activities, including physical activity, nutrition, and behavior.

Five chronic diseases associated with obesity:

- heart disease
- cancer
- stroke
- chronic obstructive pulmonary disease (e.g., bronchitis, emphysema, asthma)
- diabetes

They account for more than two-thirds of all deaths in the United States. They claim more than 1.7 million American lives each year and hinder daily living for more than one of every 10 Americans. More than 100 million Americans live with chronic disease, and millions of new cases are diagnosed each year.

These chronic diseases are among the most prevalent and deadly health problems facing our nation, but some of them are very preventable. Firefighters and their families can take simple, affordable steps to work physical activity, good nutrition, and behavior changes into their daily routine. You don't have to become a marathon runner or buy a health club membership to improve personal fitness. Your health will improve with modest but regular physical activity and better eating habits.

There are four keys for a healthier America:

- Be Physically Active Every Day.
- Eat a Nutritious Diet.
- Get Preventive Screenings.
- Make Healthy Choices.

The State Fire Marshal's Office also recommends that fire departments and firefighters adopt physical exercise regimens that will best prepare firefighters for the strenuous, often prolonged physical effort involved in fighting fires.

**Here are some excellent resources:**

Volunteer Fire Service Fitness and Wellness Program: The U.S. Fire Administration (USFA) and the National Volunteer Fire Council (NVFC) have created the Volunteer Fire Service Fitness and Wellness Project, a partnership initiative to reduce loss of life among volunteer firefighters from heart attack and stress. USFA is a part of the Federal Emergency Management Agency. You can find out more at [http://www.usfa.dhs.gov/downloads/pdf/publications/fa\\_321.pdf](http://www.usfa.dhs.gov/downloads/pdf/publications/fa_321.pdf).

The National Fallen Firefighters Foundation (NFFF) and Pennell Corporation have established a website, [www.everyonegoeshome.com](http://www.everyonegoeshome.com), for the nationwide Firefighter Life Safety Initiatives program.

## Appendix 2: Firefighter Health and Wellness Initiatives

From the U. S. Fire Administration

### Firefighter Health and Wellness Initiatives

The leading cause of firefighter on duty deaths are stress and cardiac-related, which historically have accounted for nearly half of all firefighter fatalities. Effective health and wellness programs can reduce this number one cause of firefighter deaths. To support this, the U.S. Fire Administration (USFA) has developed the following partnerships and programs:

#### Fire Service Joint Labor Management Wellness-Fitness Initiative

USFA partnered with the International Association of Fire Chiefs (IAFC) and the International Association of Fire Fighters (IAFF) to support expanding the use of the *Fire Service Joint Labor Management Wellness-Fitness Initiative* to additional fire departments. The *Initiative* was developed by the IAFC and the IAFF to enhance firefighter wellness, health, and safety and has been implemented successfully in many fire departments throughout the United States. With the IAFC, USFA supported an ongoing program to develop best practices in firefighter health and wellness for the fire service. The partnership with the IAFF supported the development of the Peer-Credentialing Program for fire department Peer Fitness Trainers that is recognized by the American Council on Exercise (ACE), the largest nonprofit fitness certification and education provider in the world. Many fire department Peer Fitness Trainers have been certified through this program.

#### Volunteer Fire Service Fitness and Wellness

Partnership efforts between USFA and the National Volunteer Fire Council (NVFC) involved research and development of effective health and wellness programs aimed at the needs of volunteer firefighters. Through this partnership, the *Health and Wellness Guide for the Volunteer Fire and Emergency Services* was developed and updated.

#### Study of Cancer among Firefighters

USFA and the National Institute for Occupational Safety and Health (NIOSH) partnered on a study to examine the potential for increased risk of cancer among firefighters due to occupational exposures from smoke, soot, and other contaminants in the line of duty. This will be a formal epidemiological study with medical oversight. This study is intended to fill gaps in current knowledge to further characterize the potential cancer risk associated with these exposures.

#### Study of Fire Service Respiratory Disease

USFA partnered with the IAFF in support of their study of *Respiratory Disease and the Fire Service* that provides the results of a long-term initiative aimed to enhance the occupational health of the fire service. The goal of this project is to research the long-term effects and post exposure mitigation of occupational respiratory exposure to firefighters and develop a report based on this research. This effort involved renowned experts in respiratory medicine. This study also assisted in recognizing and quantifying the impact of, and need for, strategies and programs to deal with occupational respiratory disease for firefighters, their families, and fire departments.

#### Emergency Incident Rehabilitation

USFA, in partnership with the IAFF, updated the *Emergency Incident Rehabilitation* manual, incorporating the latest information on the care of firefighters engaged in emergency scene and training operations through effective rehabilitation. The manual also provides case studies illustrating the need for effective emergency responder rehabilitation. An effective emergency incident rehabilitation program supports firefighter health and wellness.

#### Study of the Impact and Mitigation of Sleep Deprivation In Emergency Services

USFA worked with the IAFC in studying the impact of sleep deprivation on human performance and developing mitigation measures related to the fire and emergency services. It examined this issue and its impact on cardiac stress as well as human performance issues such as vehicle operations, firefighting, providing medical care, and managing and commanding incidents. This research resulted in the report and accompanying video presentation—*The Effects of Sleep Deprivation on Firefighters and EMS Responders*.

#### Study of Emerging Health and Safety Issues of the Volunteer Fire Service

This partnership effort between USFA and the NVFC involved the study of emergent issues related to firefighter occupational health and safety occurring in the volunteer fire service, and developed a comprehensive report detailing programs and strategies on how firefighter fatalities among volunteers may be reduced.

Further information on the projects listed above may be found on the USFA website at:

[www.usfa.dhs.gov/fireservice/research/safety](http://www.usfa.dhs.gov/fireservice/research/safety)