

STATE FIRE MARSHAL'S OFFICE

Firefighter Fatality Investigation



Investigation Number 05-218-02

Captain Grady Burke

Houston Fire Department

February 19, 2005

Texas Department of Insurance
Austin, Texas

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Summary

Captain Grady Burke, age 39, died while conducting an interior fire attack in a vacant single family dwelling on February 19, 2005. Captain Burke was a member of the Houston, Texas Fire Department (HFD).

As Captain Burke and another Houston firefighter advanced a hose line into the residence, a portion of the structure collapsed. Captain Burke was trapped when the collapsing structure pushed a large volume of burning gases through the remainder of the building.

Other firefighters inside the burning structure made their way out of the building following the collapse. Another fire Captain sustained serious burns to his leg, and two other firefighters sustained minor burns but none of the three required hospitalization.

When the fire was brought under control, firefighters entered the building and found Captain Burke's body. Captain Burke was transported to the Harris County Medical Examiner for autopsy. The cause of death was thermal injuries and smoke inhalation.

Captain Burke served in the Houston Fire Department for 12 years. He is survived by his wife and three children.

Introduction

The Texas State Fire Marshal's Office was notified of the death of Houston Fire Captain Grady Burke on February 19, 2005. State Fire Marshal's Office (SFMO) Chief Inspector Richard L. Bishop was assigned as the SFMO fatality investigation team leader. Bishop and other city, state, and federal investigators traveled to the fire scene in Houston on February 19, 2005 to conduct an investigation of the incident.

The SFMO commenced a firefighter fatality investigation under the authority of Texas Government Code Section 417.0075. The statute requires SFMO to investigate the circumstances surrounding the death of the firefighter, including the cause and origin of the fire, the condition of the structure, and the suppression operation, to determine the factors that may have contributed to the death of the firefighter. The State Fire Marshal is required to coordinate the investigative efforts of local government officials and may enlist established fire service organizations and private entities to assist in the investigation.

The National Fallen Firefighter's Foundation and the National Institute for Occupational Safety and Health (NIOSH) Fire Fighter Fatality Investigation and Prevention Program were notified.

Origin and Cause Investigation

Investigators from the State Fire Marshal's Office, Bureau of Alcohol, Tobacco, Firearms, and Explosives, Houston Fire Department Arson Bureau and Houston Police Homicide Division conducted an examination of the scene of the fire from February 19 to February 20, 2005. Follow-up investigations were conducted at various other locations in the area.

The cause of the fire was determined to be accidental.

Investigators determined that a trespasser in the vacant residence had ignited a small fire for heat and illumination while using drugs in the den. The trespasser fled when the fire grew out of control and the spread throughout the rear of the residence.

Houston investigators identified and arrested a suspect who later plead guilty to manslaughter and was sentenced to 12 years in prison.

Building Structure and Systems

The structure was a one-story wood frame ranch-style house originally constructed in the 1950's. The house was site-built over a pier and beam foundation. Asphalt shingles covered the roof supported by rafters in a common hip configuration. Additional rooms were added to the rear of the structure after initial construction. One addition was built on a two-pour slab foundation while the second addition was built on a block and wood beam foundation. The house measured 28 feet wide by 64 feet long. The den addition spanned the entire width of the house beyond the kitchen. The den addition ceiling joists spanned the 28-foot width of the house without any support from load-bearing walls or columns.

The house had been vacant since the owner's death in 2004 and had been vandalized extensively. Removal of household fixtures and electrical wiring created unprotected horizontal and vertical openings in the walls and ceilings conducive to the rapid spread of fire and fire gases. An extensive amount of combustible material covered the floors at depths of over one foot. Additional combustibles were stored in the open attic space. The residence was known to be used by vagrants for illicit drug activities by local residents and Houston fire, police, and building code enforcement departments.

There was no fire protection equipment, such as operable smoke alarms or fire extinguishers, installed in the vacant structure.

Fireground Operations Sequence

The following recollections of the firefighters who were in the interior of 8510 Brandon events are detailed below. These observations were described in post-incident statements and interviews. I propose this section remain in case somebody challenges it later-RLB

At 06:04:20 D46, District Chief Bisbano arrives at the fire at 8510 Brandon and parks near the driveway just southeast of the fire building and assumes Brandon Command.

At 06:04:25 E46, commanded by Captain Grady Burke, driven by Engineer/Operator (E/O) William Goodroe and staffed by firefighters David Pate and Cory Dixon along with an off duty Houston firefighter Terry Amarro, arrived on the scene and parked on Brandon Street approximately 41 feet east of the front of the building.

L46, commanded by Senior Captain Frank Currie, driven by E/O Chris Peel, and staffed by Firefighters Scott Graeter and Joe Robinson arrives on the scene at 06:04:59 and parks just north of the rear of E46.



Interior of 8510 Brandon (post fire)

Off-duty Houston firefighter Tony Trinidad pulled a blue 1 ¾" preconnected hose line from E46 and stretched it to the front door of the building. Firefighter Trinidad kicked the front door of the building open to allow Captain Burke and firefighter Pate to enter the living room area. In his statement, Firefighter Pate described the living room as having "(expletive) on the floor and all around."

Captain Burke, with Firefighter Pate on the nozzle, advanced from the living room, through the dining room, and into the kitchen area of the building. Firefighter Pate described the visibility as fair, with smoke banking down from the ceiling.

Outside the structure L46 Senior Captain Currie instructs L46 firefighters Graeter and Robinson to remove the front door. While Graeter and Robinson are removing the door, L46 Senior Captain Currie enters the building and proceeds through the living and

dining rooms turning into the hallway and returning to the dining before having to put his regulator in his SCBA face piece. Firefighter Dixon, who had been delayed entering the structure, was in the dining room feeding hose to Captain Burke and firefighter Pate as



they advanced when Captain Currie met him and told him “Let’s go!”. E46 Captain Burke and firefighter Pate are attempting to locate the main body of fire.

**North side of 8510 Brandon shortly after firefighters entered.
(Houston Fire Department Photo)**

E46 firefighter Pate stated he handed the nozzle to Captain Burke when Captain Burke told him they needed to turn to the right. [Captain Burke is believed to be standing in the doorway between the kitchen and the bar area of the den.] Firefighter Pate described observing a “river of fire” on the ceiling behind them. Captain Burke turned and applied water on this area and the fire disappeared. At this time Captain Burke and firefighter Pate continued to advance the hose line deeper into the building.

Firefighter Pate stated he heard L46 Senior Captain Currie shout to them that they needed to get out. Firefighter Pate stated he observed fire appear behind them again, banking down from the ceiling in a rolling motion. Firefighter Pate stated he was bumped off the hose line, then heard the air horns on fire apparatus sounding the evacuation signal. Firefighter Pate stated that everything “lit up with fire all around me.” Firefighter Pate stated that his helmet was knocked to one side of his head so he grabbed his SCBA mask to keep it from being dislodged. Firefighter Pate stated he found the hose line but could not determine his location from the hose. Firefighter Pate left the hose line and found a wall and followed it toward the front of the house. Seeing the red lights of fire apparatus, firefighter Pate knocked out a window with his gloved hand and crawled out of the easternmost window on the north side of the living room. [Eyewitness video shot at the scene shows the windows of the living room full of flames

with firefighter Pate's glove visible as he knocks the window out.] Firefighter Pate sustained second-degree burns to his right elbow and the fingers of his left hand.



Front (East side) of 8510 Brandon at the time the roof collapse forced smoke and burning gases throughout the building. E46 and L46 crews are inside the building at this time. (Houston Fire Department Photo)

L46 firefighters Graeter and Robinson had entered the house after removing the door and initiated a search pattern to the left, through the living room and hallway into the front (east) bedroom. Visibility in this room rapidly approached zero accompanied by a dramatic increase in heat. L46 firefighter Robinson described the whole room turning orange, with even the floor being on fire. Firefighter Robinson recalled hearing the evacuation horns sounding and feeling water sprayed on him as he followed the wall back to the front door, where he was assisted to the outside. Firefighter Robinson removed his burned protective gear. When he heard that Captain Burke was still inside, Firefighter Robinson obtained protective equipment from another firefighter and attempted to reenter the house, but an officer directed him to the rehab area where he was treated for second degree burns to his right shoulder and left shin and first degree burns to all of his fingers.

Engine 55 had entered the structure to support E46 fire attack. They stated that they were approximately 10 feet inside the structure when the event took place. When the Captain attempted to extinguish the fire he found that he had no pressure (he later found the hose had burst). He and his crew were able to follow the hose and were assisted out of the house.

E46 firefighter Dixon observed fire near the ceiling temporarily blacking out as E46 then the fire suddenly intensified. Firefighter Dixon said he saw the left arm of his bunker coat was on fire and it would not go out when he patted it. Firefighter Dixon heard L46 Captain Currie tell him it was time to get out and after tripping and falling once, Dixon was able to follow the hose line and walk out the doorway where firefighter Amarro was calling out to him. Firefighter Dixon did not reenter the building after escaping.

L46 Captain Currie was approaching E46 Captain Burke and firefighter Pate when he said it appeared part of the building collapsed and suddenly flames surrounded him. Captain Currie said his SCBA mask lens was crazed by heat exposure and he could not see. Captain Currie radioed that they were “trapped” and “need help” on his handheld radio. He then dropped the radio while trying to change channels because burns to his hands affected his manual dexterity. Captain Currie said he located a fire hose and sprayed water on L46 firefighters Graeter and Robinson who were on fire. Captain Currie remained in the building until E35 Acting Captain Tony Reed assisted him out. Captain Currie sustained second and partial third degree burns to his buttocks, the back of his left thigh and his left and right calves.

L46 E/O Peel stated he and E46 rider Amarro set up a positive pressure ventilation fan at the front door. E/O Peel stated he observed the fire flare up and it appeared to be moving to the front of the house. E/O Peel obtained a pike pole and broke out the window on the east side of the house, near the northeast corner when he observed heavy smoke coming from the front door. E/O Peel said the fire rapidly intensified after he broke the window. When fire began rolling out the front door E/O Peel sounded the air horns on L46 in an evacuation signal upon orders of Brandon Command, D/C Bisbano. As the horns were sounding E/O Peel observed E46 firefighter Pate jump out of a window on the north side of the residence near the northeast corner. L46 E/O Peel assisted E46 firefighter Pate remove his protective equipment while Peel asked about E46 Captain Burke.

E/O Peel and others took a third line from E46 to the front door. When E/O Peel observed somebody being carried out of the house, he assumed it was E46 Captain Burke when it was actually L46 Captain Currie. Captain Currie told E/O Peel to get the thermal imager camera (TIC) from L46 and to search to the left. E/O Peel did so without the aid of an SCBA. Upon hearing that Captain Burke was still inside, E/O Pate returned to E46 to obtain an SCBA. E/O Peel and E25 firefighter Cooper entered the house to search for the missing firefighter.

L46 E/O Peel heard on his radio that Captain Burke had been located by E25 and he moved to the rear of the residence where he and L55 firefighter Michael Gibson dragged Captain Burke toward the west side of the building. E25 E/O Jim Morris told them that Captain Burke was obviously deceased and not to move the Captain any farther.



North side of 8510 Brandon (post-fire) (Houston Fire Department Photo)

At 06:29:47 Command transmitted an announcement that E46 Captain Burke had been found in the rear of the building.

At the request of Command, HFD dispatch sounded the tap out for the fire alarm at 8500 Brandon at 07:41:14.

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

On April 4, 2004 at 05:59:34, the Houston Fire Department received a report that a house was on fire in the area of 8500 Brandon in Houston with smoke and flames visible. At 06:01:04 District Chief 46 (D46), Engine 46 (E46), Engine 35 (E35), Engine 55 (E55), Ladder 46 (L46) Ladder 55 (L55), Squad 46 (SQ46) Engine, and Ambulance 33 (A33) were dispatched to the fire.

At 06:04:21 E46 arrived at 8510 Brandon and made the following report: "E46 on location, One-story heavy fire showing. E46 initiating "Fast Attack". At the same time, D46 reports he is also on location, has a one story house with heavy fire visible and that he is assuming Brandon Command. (Hereafter referred to as "Command".) At 6:04:58 Command orders E46 to make a fast attack on the fire.

At 6:05:21 Command orders incoming E35 to take the 4-inch supply hose from E46 and connect it to the hydrant at Brandon and Belfort. (Approximately 80 feet north of E46's location.) Command also orders E35 to advance a second 1 ¾" hose line.

At 6:06:18 Command instructs E55 to come in and be the RIT team.

At 6:06:43 Command orders E55 to disregard and proceed to the front of the building to stretch a second hose line off E46. E35 is then assigned as the RIT team by Command.

At 6:07:08 Command transmits "District 46 calling OEC, Primary Search is not possible at this time." Dispatch acknowledges Command's transmission at 06:07:16.

Command assigned Engine 35 at 6:06:43 to set up and maintain the Grace™ electronic accountability system (EAS) and become the rapid intervention team (RIT).

At 06:07:08 Command advised Houston Fire Radio that "Primary Search is not possible at this time." At 6:08:13 Command orders L55 to check buildings exposed to the fire.

At 6:08:32 Command announced that Electronic Accountability was in place.

At 06:08:51 Command orders E55 to take another hose line to backup E46. E55 acknowledges and reports that the exposures are not at risk of fire spread.

At 06:10:54 Command transmitted "Command calling Engine 46,... Uh, give a report." The next recorded transmission is from Command at 06:11:02, "Back out of the house, back out of the house." At 6:11:09 Command requested Houston Fire Dispatch, "Command calling OEC, Give me an air horn blast, I need to evacuate the building." At 6:11:17 Houston Fire Dispatch transmits a long evacuation tone signal followed by "All units in the house fire back out! All units doing an interior house...Interior attack to the house fire you need to back out! Immediately! Time 06:11"

At 06:11:41 Command requested a Personnel Accountability Report (PAR) from all companies assigned to the fire. At 06:12:02 the following transmission from an unknown source is recorded "Engine 46 Captain,... all are lost." At 06:12:12 Command transmitted "RIT Team, Engine 35, I've got somebody in the house talk to me."

At 6:12:25 L46 transmits "Ladder 46 We're trapped...Ladder 46 (unintelligible)" followed at 06:12:40 by "Ladder 46...We need help!" At 6:12:51 Houston Fire Radio transmits a long alert tone followed at 06:12:57 with "OEC to all units...We have a trapped firefighter, we have a trapped firefighter...we have a trapped firefighter at this location.... Time 06:13."

At 06:13:22 an unknown unit requests a second alarm. At 06:13:34 Houston D33, D26, E33, E47, E25, L33, R42, Safety 23 (S23), S2, Cascade 23, Rehab 17, Ambulance Supervisor 16, Shift Commander 27, and Command Van 11 are dispatched to the Brandon Street fire.

At 06:13:53 Command calls L46 but the message is unintelligible. At 06:14:19 Command asks Accountability for the status of firefighters on the scene. At 06:14:27 Accountability calls Command "...I cannot account for Engine 46 Firefighter C." [E46 firefighter C was later identified as firefighter Graeter.]

At 06:15:39 Command calls the RIT team to request an update on their activities. At 06:18:44 Command transmits "District 46 calling Engine 35 RIT Team has no (unintelligible), Captain on 46." At 06:22:21 Command requests a status report from E25. E25 replies that they are still searching. At 06:26:34 Command directed L33 and L6 to report to the rear of the house to D33 and to bring tools.

At 06:28:45 an unknown unit asks "Do we have a TPASS going off for Engine 46 Captain still?" Accountability Command replies "No!"

At 06:29:17 Command asks E25 if they can get Captain Burke out of the building. At 06:29:27 E25 transmitted "Command, just a minute. I'll be back here,...we're getting him out right now." At 06:29:47 Command transmitted "Command to all units...The lost firefighter has been located in the rear of the house."

At 07:41:14 at Brandon Command's request, Houston Fire Radio taps out the house fire at 8510 Brandon.

Personal Protective Equipment and Injury Evaluation

Captain Burke entered the building wearing full firefighter protective equipment, including a helmet, flame resistant hood, bunker coat, bunker pants, boots, gloves, and a self-contained breathing apparatus (SCBA).

The Texas Commission on Fire Protection was requested to assist in the investigation and examined the remnants of Burke's personal protective equipment. Due to the extensive destruction of the protective equipment it was not possible to determine if the equipment was in compliance with all NFPA standards.

The self-contained breathing apparatus (SCBA) was too badly damaged to be evaluated and tested for proper performance. The EAS PASS device was also damaged; it was not completely destroyed but could not be tested.

Cause of Death

Captain Burke was found lying prone near the passageway from the kitchen area to the den area. Most of his protective equipment had burned away. Firefighters who found him attempted to remove him from the building but were stopped near the rear porch area when it became obvious that Captain Burke was deceased. (See diagrams at end of report)

The Medical Examiner's report listed the cause of death as smoke inhalation and thermal injuries. Burke sustained burns to 95% of his body. Postmortem

carboxyhemoglobin was measured at 26% and soot was observed in his upper and lower airways.

Based on these findings, it is surmised by The State Fire Marshal's Office that Captain Burke was trapped by the collapsing building and was exposed to intense heat which quickly overwhelmed his protective equipment, exposing him to burns and toxic products of combustion.

Findings & Recommendations

The following recommendations are based upon nationally recognized consensus standards for the fire service. All fire departments should be aware of the content of the standards and should develop programs based on them to increase the level of safety for fire department personnel.

Finding #1 - Choice of Fire Suppression Strategy:

Command committed additional units to an interior offensive attack despite having determined that an interior search for occupants was not possible and failed to order committed companies from the structure.

The incident commander shall integrate risk management into the regular functions of incident command. The concept of risk management shall be utilized on the basis of the following principles:

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

Recommendation: All fire departments and fire officers should review and operate under the Incident Management System as to nationally recognized incident priorities:

- Life Safety
- Incident Stabilization
- Property Conservation

The risk to fire department members is the most important factor considered by the incident commander in determining the strategy that will be employed in each situation.

NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, Chapter 8.3, 8.4, Quincy, MA: National Fire Protection Association

Finding #2 – Command Accountability:

Radio transcripts did not show L46 checking in or receiving an assignment over the radio upon arrival. L46 did not ask for an assignment prior to entering the building.

The first radio transmission recorded from L46 is when L46 Captain Currie reports they are trapped in the building. Statements gathered during the investigation reflect a face-to-face meeting between D46 Command and L46 where D46 instructed L46 not to attempt vertical ventilation, but no other orders to L46 were noted.

Effective communications are essential to ensure that the incident commander is able to receive and transmit information, obtain reports to maintain an awareness of the situation, and communicate with all component parts of the incident organization to provide effective supervision and controls.

Recommendation: All fire departments and fire company officers should review their own department communication procedures and adhere to nationally recognized fire department procedures to ensure true accountability of their resources on the scene of an emergency.

NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, Chapter A.8.1.8 (3), Quincy, MA: National Fire Protection Association

Finding #3 - Maintaining Company Integrity:

The statement of the Captain of L46 indicates he entered the burning building on his own and failed to maintain company integrity.

The statements of the two L46 firefighters confirm this statement when the firefighters stated they never made contact with their company officer inside the structure.

Members operating in hazardous areas at emergency incidents shall operate in crews of two or more. Company officers shall maintain an ongoing awareness of the location and condition of all company members.

Recommendation: Fire personnel maintain company integrity during all emergency operations.

NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, Chapter 8.4.4, Quincy, MA: National Fire Protection Association; Maintain Crew Integrity, Fire Engineering Magazine, March 1997, Tulsa, OK, PennWell Corporation

Finding #4: Fireground Operation Safety Issues

4.1 A thermal imaging camera (TIC) was available on the scene but was not used during the initial entry into the burning building, as required by departmental SOG, which states, “the TIC will be utilized in every structure fire” with priority given to search and rescue operations followed by the fire attack and rapid intervention teams.

This failure to follow departmental thermal camera procedures has been previously identified as a factor in several firefighter fatalities. The Houston Fire Department has an established standard operating guideline (SOG) regarding thermal imaging camera use at structure fires.

The SOG states “Senior Captains/Captains will be responsible to ensure that the thermal imaging camera is removed from their assigned apparatus and deployed on every dispatched structure fire and other identified situations that will enhance the safety of fire fighting personnel or rescue operations.” The SOG outlines and prioritizes the various situations for the use of the TIC. The SOG also states “the TIC will be utilized in every structure fire” with priority given to search and rescue operations followed by the fire attack and rapid intervention teams.

A thermal imaging camera was available but not utilized during the early stages of this incident as per the SOGs. The use of a TIC during initial size-up and entry into the structure could have confirmed that the fire was already burning in the attic area overhead. This information may have influenced the incident commander to use more defensive tactics.

4.2 An E/O chose to enter the burning structure without appropriate personal protective equipment.

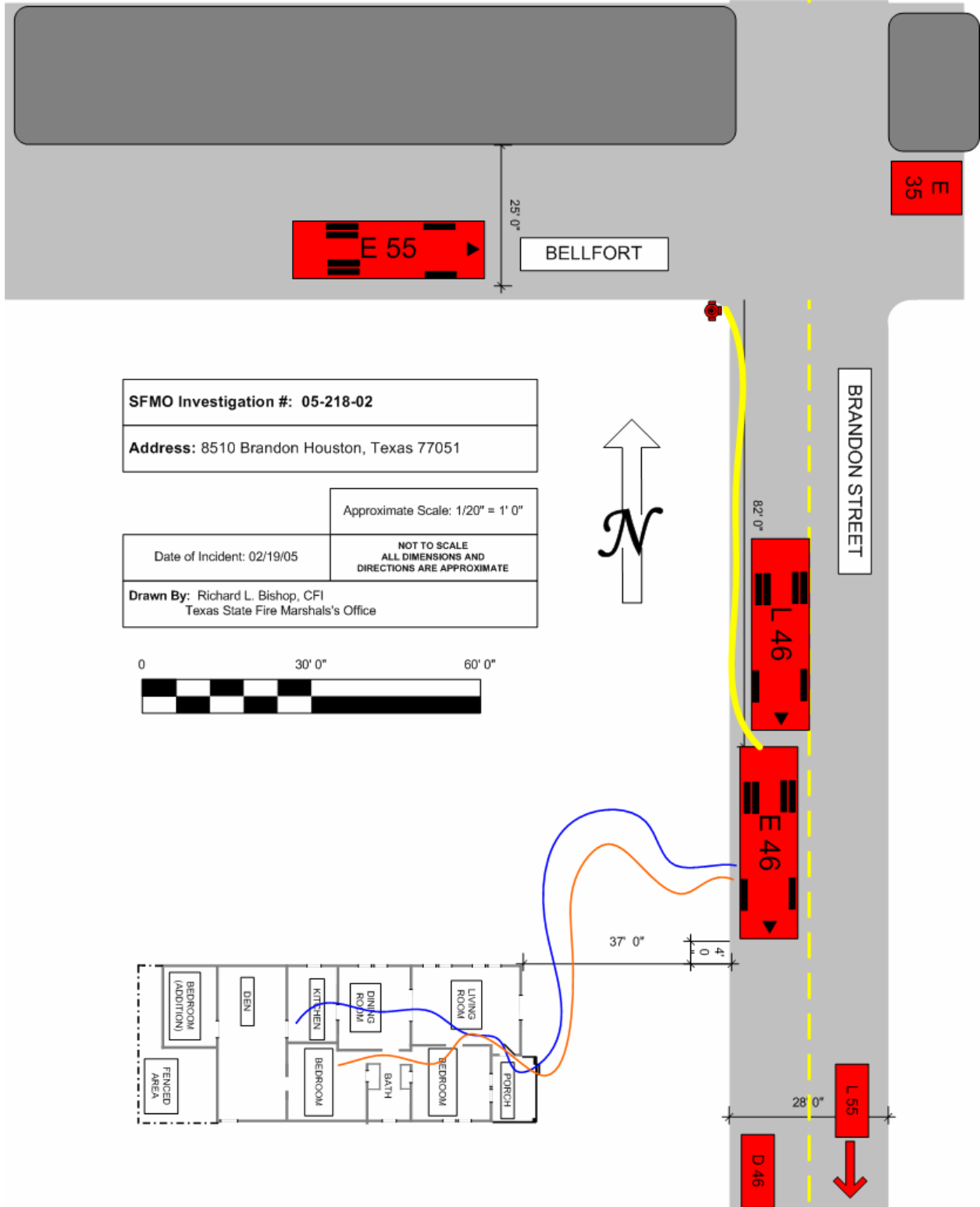
Firefighter statements indicate that the L46 Captain ordered L46 E/O into the building. L46 E/O entered the burning building after the call for help without appropriate personal protective equipment including an SCBA.

Protective clothing and protective equipment shall be used whenever a firefighter member is exposed or potentially exposed to the hazards for which the equipment is provided.

4.3 Safety Officers are not dispatched on house fires until the initiation of a second alarm.

Recommendation: 4.1 Thermal imaging cameras (when available) should be utilized as part of the initial size-up of a fire and subsequent fire attack and search and rescue operations to improve life safety of both firefighters and civilians. 4.2 Fire departments and firefighters should never operate in a hazardous area without approved personal protective equipment. 4.3 It is recommended that all fire departments consider assigning an Incident Safety Officer be assigned to all emergency incidents on the first alarm or report of a working fire.

Thermal Imaging For The Fire Service, Part 5: Tactics For Fire Attack, Fire Engineering Magazine, March 1997, Tulsa, OK, PennWell Corporation; NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, Chapters 7.1.2, 8.2.5, A8.2.5, Quincy, MA: National Fire Protection Association.



SFMO Investigation #: 05-218-02	
Address: 8510 Brandon Houston, Texas 77051	
Approximate Scale: 1/8"=1' 0"	
Date of Incident: 02/19/05	NOT TO SCALE ALL DIMENSIONS AND DIRECTIONS ARE APPROXIMATE
Drawn By: Richard L. Bishop, CFI Texas State Fire Marshals's Office	

