

STATE FIRE MARSHAL'S OFFICE

Line of Duty Death Investigation



Investigation Number 03-193-01

Firefighter Gary L. Staley

Porter Volunteer Fire Department

January 19, 2003

Texas Department of Insurance
Austin, Texas

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Summary

Gary L. Staley, age 31, died of undetermined injuries while conducting an interior fire attack at an automobile showroom fire on January 19, 2003. Staley was a member of the Porter, Texas, Volunteer Fire Department (VFD).

Staley was with three other Porter and New Caney VFD firefighters and was advancing a hose line into the showroom area of an automobile restoration facility and parts store when the fire rapidly increased in intensity causing the hose team to withdraw from the building. Staley and the other team members separated as they attempted to exit the building.

The other three firefighters on the hose team made their way independently to the outside of the building. Two of the firefighters sustained critical burns and were hospitalized. The third firefighter sustained minor burns to his hands and was treated on the scene. An explosion occurred after the other three firefighters exited.

An attempt was made by Houston firefighters to locate Staley and remove him from the building, but intense heat and the potential for collapse prevented the rescue team from advancing more than a few feet into the building.

Many other area fire departments responded to the multiple alarm fire and after the fire was brought under control, firefighters entered the building and found Staley but he was obviously deceased. Staley's body was transported to the Harris County Medical Examiner for autopsy.

Staley sustained multiple injuries including extensive burns from fire exposure. The exact cause of death remains under investigation by the Medical Examiner

Firefighter Gary L. Staley served in the Porter Volunteer Fire Department for two and one-half years. He is survived by his daughter and parents.

Introduction

The Texas State Fire Marshal's Office was notified of the death of Porter firefighter Gary Staley on January 19, 2003. State Fire Marshal's Office (SFMO) Chief Inspector Richard L. Bishop was assigned as the SFMO fatality investigation team leader. Bishop and other county, state, and federal investigators traveled to the Porter Volunteer Fire Department on January 19, 2003, to conduct an investigation of the incident.

The SFMO commenced an LODD investigation under the authority of Texas Government Code Section 417.0075. The statute requires the 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

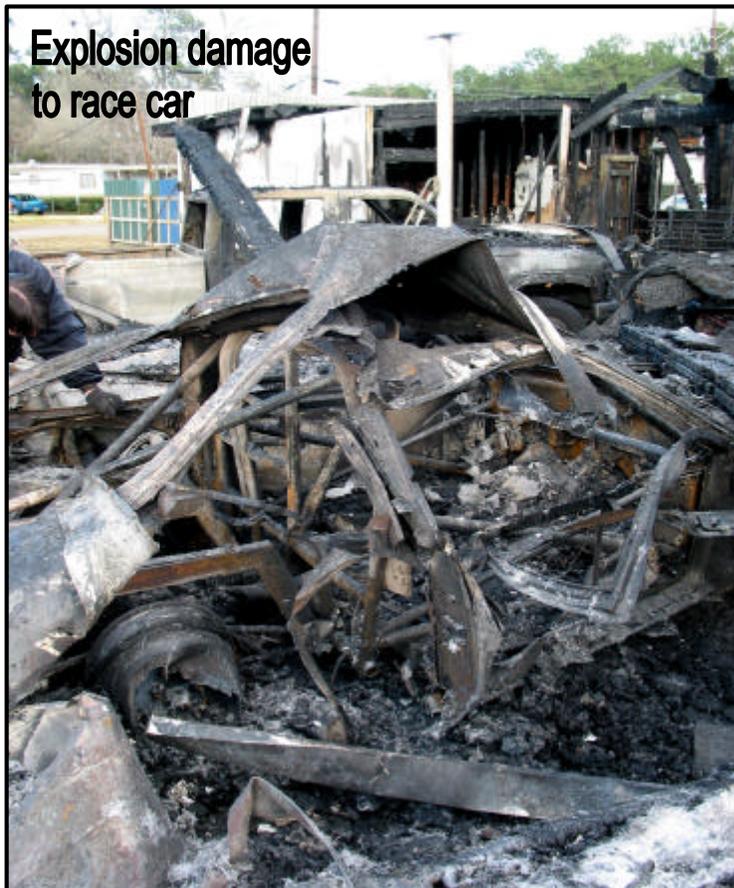
is required to coordinate the investigative efforts of local government officials and may enlist established fire service organizations and private entities to assist in the investigation.

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; and Montgomery County Fire Marshal's Office conducted an examination of the scene of the fire from January 19 to January 24, 2003.

Investigators determined that approximately 5-10 gallons of flammable liquid (lacquer thinner) had been spread on the floor in the west end of the showroom area, allegedly to prepare the floor for applying ceramic tile. The tile worker claimed vapors from the liquid ignited when he plugged in a forced air space heater. The flaming liquid ignited the contents of the building, including boxes of auto parts, lubricating oil, classic and racing cars, personal watercraft, a boat and other vehicles. The building was destroyed by the fire.



During the fire a nitrous oxide cylinder exploded and fragmented causing extensive damage to a Chevrolet Monza race car. The deceased firefighter sustained some trauma from the explosion, but at this time it is not known if this was the primary cause of the firefighter's death.

The hose line nozzle was found in the area next to the blast-damaged race car. The force of the explosion was sufficient to propel a fire extinguisher through the side of the car and wrap it around a metal support post.

Samples of flammable liquids and other materials were collected by the Montgomery County Fire Marshal for

laboratory analysis by the State Fire Marshal's Office Laboratory. The space heater that was alleged to be the ignition source, and fragments of the nitrous oxide cylinder including the cylinder safety valve, were taken by the Montgomery County Fire Marshal for examination at a later date.



On August 6, 2003, Bishop met with Montgomery County Fire Marshal Investigator Jimmy Williams regarding the origin and cause of the fire. Williams confirmed that a flammable liquid had been ignited, but the fire ignition scenario is still under investigation.

Building Structure and Systems

The Track Attack Performance Speed Shop is located at 24608 Loop 494 in Porter, Texas. No building or fire codes were in effect at the time of construction. There is no adopted fire code in Montgomery County and the Montgomery County Fire Marshal had not conducted any inspections of the facility. This building had previously been occupied as a lumberyard and hardware store. It was under renovation for use as a showroom for classic and racing cars and a sales area for performance auto parts.

The business faces east and fronts onto Loop 494. The single-story building is of wood frame construction. Metal siding covers all areas except the concrete block façade on the front part of the building. The floor is a concrete slab. The roof in the front part of the building is a tar built-up roof with an overhanging canopy. The roof in the remainder of the building is corrugated metal installed over wood joists supported on metal columns. There is a rear overhanging roof protecting an open storage area enclosed with chain link fencing. There are several additions to the original building.



Means of Egress

All openings into the building were equipped with security bars or grilles. All openings were closed and locked at the time of the fire with the exception of the north (right-hand) leaf of the double front entrance door.

Features of Fire Protection

The building is not equipped with a fire alarm or fire sprinkler system.

Building and Systems Performance

As the fire progressed, the metal roofing and wood rafters collapsed in the showroom area. None of the metal support posts failed. The area where the deceased firefighter was found had no significant structural failures.



Fireground Operations and Firefighter Death Investigation

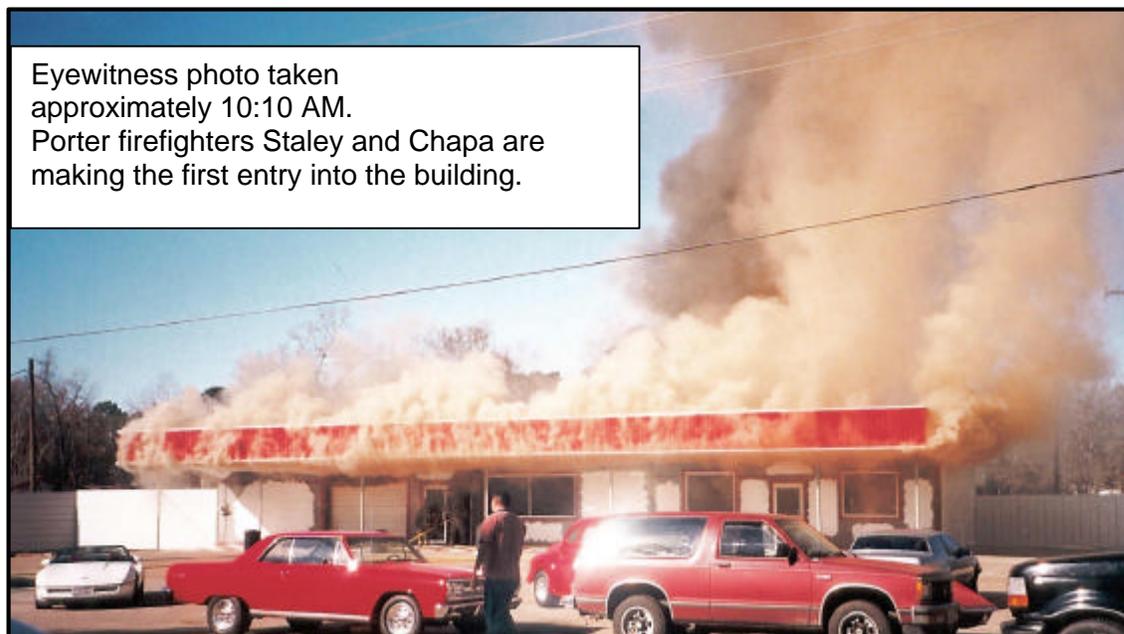
NOTE: The following sequence of events was developed from known times of events based on radio transmission timestamps, firefighter witness statements, and comparison of eyewitness photos and video news footage. Those events with known times are identified. Events without discrete times are approximated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

On January 19, 2003, at 9:59:09 AM, the Porter Volunteer Fire Department was dispatched to a reported commercial fire at 24608 Loop 494 in Porter, Texas. Porter Fire Chief Jody Binnion (Chief 12) arrived at the scene at 10:06:40 AM prior to fire apparatus and observed a commercial building with heavy smoke coming from the southwest rear. Flames were venting and there was a rising column of heavy black smoke. Winds were light out of the southeast. The right side of the main entrance door at the front of the building was unlocked. Chief Binnion took command of the incident.

Volunteer firefighter Gary Staley left his home and traveled to the Porter VFD fire station where he boarded Porter Engine 121 (E121). Six Porter VFD firefighters were aboard. Mike Zipprian drove, Gary Staley was in the front officer seat, and Richard Mixx, Kristina Zipprian, William Ford and Juan Chapa rode in the crew compartment. Engine 121 left the station at 10:09:19 AM and was the first engine on the scene at 10:09:51 AM.

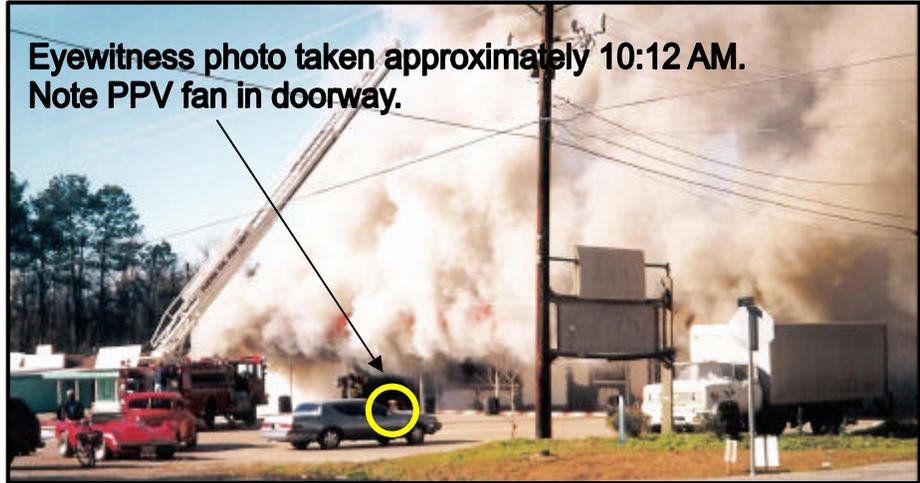
The crew of E121 was directed by Chief Binnion to prepare to advance a 200 foot 1 3/4" compressed air foam line with a 200 GPM nozzle into the building to make a quick attack. Mike Zipprian was assigned as pump operator. The first hose team consisted of Juan Chapa, Gary Staley, and Richard Mixx. Neither Kristina Zipprian and William Ford were trained enough to be assigned to interior firefighting so Chief Binnion ordered them to start pulling hand tools and extra SCBA bottles off the engines and placing them on a red tarp for a rehab area.

Firefighters Staley and Chapa entered the front door of the building, opened an adjacent overhead door, withdrew and operated their hose in the doorway pending arrival of additional personnel. Mixx did not enter, but assisted in feeding hose through the doorway and preventing the door from closing on the hose. No rapid intervention team (RIT) had been established at the time of initial entry.



New Caney VFD Engine 151 (E151) was automatically dispatched for mutual aid and was the second engine on the scene at 10:11:26 AM. New Caney Lieutenant Allen Haynes and firefighter Richard Musik from New Caney joined the Porter firefighters and they made a second entry into the building. At the time of entry, Chief Binnion stated light smoke was present from floor to ceiling. Chief Binnion stated that there was not a designated person in command of the entry team. An RIT team had not been established at the time of the second entry.

Porter Ladder 121 (L121) with one driver arrived simultaneously with Porter Engine 122 (E122) with a driver and two firefighters. Porter Tanker 121 (T121) driven by Javier Barba arrived at 10:11:38 AM. E122 parked on Hammond St. north of the fire. Firefighters from E122 described



the smoke being so dense they had to don their SCBA masks. Chief Binnion directed Barba to take T121 and proceed south one block to a fire hydrant and establish a water supply. Barba drove T121 with one firefighter to the fire hydrant, connected a 2 ½" hose and made a forward lay back to the fire. Barba connected the 2 ½" hose to the tank fill inlet on T121. He then connected a supply line from T121 to E122 and a line from E122 to E121. E124 supplied L121. The operator of L121 elevated the ladder. Chief Binnion and Zipprian started pulling a second 1 ¾" line and a 2 ½" line from E121 to back up the first line. Chief Binnion said he had his back to the building and could not observe the actions of the hose team.

A firefighter set up a positive pressure ventilation fan and directed it into the door openings. Chief Binnion stated that the fire had self-ventilated, therefore no additional ventilation openings were made. Chief Binnion stated he had not ordered the fan and does not know why it was set up.



The firefighters on the interior attack team described the visibility as approaching zero as they traveled farther into the interior. At one point as they advanced the line, they squeezed through a three foot wide area between a support column and a car. Working by feel, they advanced, standing up, approximately 41 feet into the building and began applying compressed air foam to the west end of the showroom area (See attached diagram). Conditions immediately began to deteriorate, with heat banking down from the ceiling onto the firefighters.

Porter firefighter Chapa was standing and told the others he was too hot and left the hose team. Chapa became disoriented and removed his gloves because he felt his

hands were burning. He eventually found a wall in the southeast corner of the building and felt his way to the doorway. Chapa's protective equipment was smoking when he exited the building and he had sustained serious burns to his bare hands. The time is estimated to have been 10:14 AM. Chapa was taken to a local burn center for treatment.

New Caney firefighter Haynes then left the hose team because he felt too hot. Haynes also became disoriented and when he could not see due to heat damage to his SCBA mask, Haynes removed his SCBA mask, hood, and gloves. Haynes found his way to the open doorway and escaped the building. Haynes sustained critical burns to his hands and face and was later transported to a local burn center for treatment. The time is still estimated to have been 10:14 AM. Chief Binnion ordered the evacuation signal sounded and requested a second ambulance when he saw the injured Chapa and Haynes exit the building.

The third firefighter, New Caney firefighter Musik, was operating the hose nozzle alone in a kneeling position approximately 40 feet into the building. He stated he did not feel any discomfort but did notice the face shield on his helmet melting and dripping in front of his SCBA mask. He deflected some water from the nozzle to cool his helmet and visor. He stated that he probably would not have exited if somebody had not blown the air horn evacuation signal. Musik left the building by crawling and following the hose line. As he was crawling, he collided with a metal column as he followed the hose through a narrow area between the column and a car. Musik lost his helmet, but continued his evacuation. He continued following the hose and escaped the building with only minor burns to the knuckles of his hands. Musik was treated on the scene. Time is estimated to have been 10:15 AM. Shortly after Musik exited, firefighters heard a large explosion inside the building.

Staley, one of the four firefighters who entered the building, became separated from the team as others left and he did not exit with them. Porter firefighter Mixx observed Chapa and Haynes exit and alerted Chief Binnion that Staley was missing. Chief Binnion checked the accountability board on E121 and did not find Staley's accountability tag on the board. Binnion asked Mixx a second time about Staley being missing before Binnion contacted an EMS supervisor to check all the ambulances on the scene to see if Staley was inside one of them.

When Mixx confirmed his first report that Staley was still inside to Chief Binnion, Binnion ordered firefighters on the scene to enter the building with a second 1 ¾" line. Chief Binnion stated his firefighters did not make any attempt at entry because the hose line had not been charged. Mutual aid units from the Houston Fire Department arrived at this time and forward laid a 4" supply line for their apparatus from the south fire hydrant. Binnion directed a team of Houston firefighters to enter the building and attempt to rescue Staley.

At approximately 10:43 AM, the rescue team from Houston took a second 1 ¾" line and advanced into the building but did not get more than 10 feet into the building because of

extreme heat and poor visibility. They withdrew when the evacuation horns were sounded a second time.

All firefighters withdrew and a defensive attack was begun. A thermal imaging camera was used to look into the interior but was not effective due to the amount of heat present. L121 operated its aerial boom in a lowered position as a master stream through the front windows. A 2 ½" and a 1 ¾" hose line was operated through the front doors. Firefighters described periodic interruptions in water supply to the Porter and New Caney apparatus because they were flowing water faster than the 2 ½" hose line could fill the tank on T121. More mutual aid units arrived and a tanker shuttle was established and aerial ladders and other master streams were directed into the building from the front and above.

After about an hour, the fire in the building was sufficiently knocked down to permit firefighters to enter the interior. Two teams began searching the building and Houston firefighters found Staley, who was obviously deceased. Staley was face down and his head was facing north into the door opening of an office area. His SCBA mask-mounted regulator had been disconnected from his face piece and he did not have gloves on. Staley's chest-mounted integral PASS device was sounding but the alarm was muffled by his body. Montgomery County Justice of the Peace James Metts was contacted and pronounced Staley dead. His body was transported to the Harris County Medical Examiner's Office for autopsy.

SFMO and Montgomery County investigators attended the autopsy. They observed that Staley had suffered severe burns to his lower back, buttocks, and thighs. He had less serious burns to his chest and shoulders. Staley had received extensive burns to his bare hands in areas not protected by the thumbhole type wristlets of his coat.

When Staley's SCBA face piece was removed, there was a quantity of bright red blood present. Staley had soot deposits on his face. Staley's skin was a bright pink.

The Harris County Medical Examiner has not released the final autopsy report, so it is unknown which injuries directly caused Staley's death. This report will be amended when the final autopsy report is released.

Personal Protective Equipment and Injury Evaluation

Firefighter Staley entered the building wearing full firefighter protective equipment, including a self-contained breathing apparatus (SCBA). When Staley's body was discovered he had his helmet, protective hood and SCBA face piece in place but his mask-mounted regulator was disconnected. Staley was wearing an SCBA with an integral chest-mounted PASS alarm device and the alarm was sounding when his body was discovered. Staley was found lying on top of his PASS device which muffled the alarm sound. There was evidence that the PASS device had been exposed to some heat and soot.

The protective visor on Staley's helmet was burned and melted but the helmet, although burned on the exterior, was intact.

Staley's protective clothing sustained extensive heat damage, burning completely away in the lower back, buttocks, and thigh areas. Damage to the bunker coat included a burned-through area on the upper right arm. Damage to the rest of the coat was limited to some moderate charring in the right hip area and melting/burning of reflective trim.

Staley sustained full-thickness burns to the areas where protective clothing burned away. Staley did not have his gloves on when his body was found. He sustained serious burns to his bare hands in areas not protected by the thumbhole-type wristlets of his coat.

There were less serious burns to Staley's arms and chest. There was a circumferential burn to Staley's left bicep that corresponded with the reflective trim on his bunker coat.

The Texas Commission on Fire Protection was requested to assist in the investigation and examined Staley's personal protective equipment. The equipment appeared to be in good condition and in compliance with all NFPA standards. Due to fire damage to the SCBA, it was not possible to submit the apparatus for laboratory testing.



The protective equipment of the three other firefighters on the hose team was also examined due to the fact that Staley's equipment was so badly damaged that it was not possible to determine if it performed properly. Two of these three firefighters on the hose team had a "close call" after they



became disoriented and escaped the building with serious burns. All three were wearing full NFPA-compliant protective ensembles and SCBA. The helmets of the two most seriously burned firefighters, Chapa and Haynes, showed evidence of extreme heat exposure, with face shields burned and deformed, but helmet shells, although burned, were intact.



The fabric shells of Chapa's and Haynes' bunker gear showed extensive melting to reflective trim. Inner liner vapor barriers were scorched even though the fabric shells of the coats appeared undamaged other than damage to the reflective trim.

Firefighter Chapa reported a circumferential burn on his bicep that matched up with the reflective trim on his bunker coat.

All SCBA masks were melted and opaque in some areas due to flame exposure. Some areas of the face pieces were undamaged because they were covered with portions of the firefighter



protective hood. Haynes sustained serious facial burns when he removed his face piece inside the building because he could not see. Haynes was the only injured firefighter that was wearing a "Reed Hood," a protective hood made of material similar to that used in bunker clothing and designed to be worn over a standard knit fabric fire resistant hood.

Musik received only minor burns to the knuckles of his hands. Musik was wearing a fire-resistant long sleeve wild land firefighting jumpsuit under his bunker gear. Chapa was wearing a long sleeved sweatshirt under his bunker coat and only received a minor burn on one arm but sustained serious burns to his hands after he removed his gloves. Haynes had a short sleeve shirt on under his bunker coat and sustained minor burns to his

back and shoulders. Hayne's and Chapa's serious burns were limited to areas not covered by any protective equipment.

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. Volunteer fire departments are not required by state statute to comply with these standards.

INCIDENT MANAGEMENT SYSTEM

- **Pre-action Plan:** No pre-action plan existed for this facility. In this particular fire, the IC and firefighters had only a general prior knowledge of this building and were not familiar with the current content and operation of the business.

A pre-action plan provides the Incident Commander (IC) with strategic information on building construction, interior contents, water supply, and special hazards that are necessary to make sound tactical decisions on the fireground. The pre-action plan provides the IC with basic information for developing the Incident Action Plan at a fire.

NOTE: Chief Binnion stated a firefighter was recently hired just prior to this incident to begin developing pre-action plans for facilities within the department's response area.

["Fire and rescue officials must preplan emergency operations to ensure efficient utilization of available resources." *Texas Fire and Rescue Mutual Aid Plan*, Section IV-B-2, Texas Interagency Coordination Center-Texas Forest Service. The *Texas Fire and Rescue Mutual Aid Plan* is an extension of and supportive document to the State of Texas Emergency Management Plan.]

- **Incident Action Plan:** One of the Incident Commander's (IC) responsibilities is to develop an Incident Action Plan (IAP). An IAP was not developed during the early stages of this incident. Incoming units were not advised of the attack mode selected and of specific assignments to support the fire attack.

The IAP provides a cohesive operational plan, consisting of the strategic goals, tactical objectives and support requirements, to assist the IC in more effectively managing the incident. An IAP should be developed whenever command is established. There are several factors the IC must consider when developing the IAP. First and foremost, the IC must evaluate the three incident priorities: Life Safety, Incident Stabilization, and Property Conservation. Are there any savable occupants? What are the risks to my personnel? Do I have the resources available to control this incident? What must be accomplished in order to minimize property damage?

Tactical benchmarks are the priorities of tasks that the Incident Commander establishes in the IAP in mitigating an emergency. Benchmarks may include search and rescue of trapped victims, protection of exposures, coordinated fire attack and ventilation to contain the fire, establishing a water supply, and preservation of property.

[NFPA 1561, *Standard on Fire Department Incident Management System*, Chapter 5.1.9-"The incident commander shall be responsible for developing and/or approving an Incident Action Plan (IAP). This plan shall be communicated to all staged and assigned members at an incident."]

NOTE: Some material in this section is excerpted from "*Tactically Speaking-Incident Action Plans*," Alan Bubel, Monroe County, NY Fire Wire, http://www.mcfw.com/main/tact/tact_8.htm and *Fire Command*, Alan V. Brunacini, National Fire Protection Association.

- **Incident Management System.** The IC's attention was diverted from monitoring the incident because he became involved in fireground operations. This did not allow him the opportunity to give strong and clear direction in this incident.

["The incident commander shall maintain an awareness of the location and function of all companies or units at the scene of the incident." NFPA 1561, *Standard on Fire Department Incident Management System*, Chapter 5.1.4.]

STANDARD OPERATING PROCEDURES (SOP'S)

- **Standard Operating Procedures:** Although firefighting Standard Operating Procedures (SOPs) were available from the Montgomery County Firefighters Association, the department did not have these, or SOPs developed by their own department, on file.

Fire departments should develop and utilize SOPs that will direct fire department personnel before, during and after an incident to provide effective and consistent fireground operations while ensuring firefighter safety. At a minimum, NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program and*, NFPA 1561, *Standard on Fire Department Incident Management System*, should be utilized in developing SOPs that include, but is not limited to, use of an Incident Management System, Two-In, Two-Out Procedures and Rapid Intervention Teams.

["The (department) shall prepare and adopt written plans, based on the incident management system, to address the requirements of the different types of incidents that can be anticipated." NFPA 1561, *Standard on Fire Department Incident Management System*, Chapter 4.2.5.]

["The fire department shall prepare and maintain written policies and standard operating procedures that document the organization structure, membership, roles and responsibilities, expected functions, and training requirements, including the following:

- (1) The types of standard evolutions that are expected to be performed and the evolutions that must be performed simultaneously or in sequence for different types of situations
- (2) The minimum number of members who are required to perform each function or evolution and the manner in which the function is to be performed

(3) The number and types of apparatus and the number of personnel that will be dispatched to different types of incidents

(4) The procedures that will be employed to initiate and manage operations at the scene of an emergency incident."

NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, Chapter 4.1.2].

FIREFIGHTING OPERATIONS

- **Crew Integrity:** Firefighters on the initial hose team were allowed to enter the burning building without a clear team leader being designated by the Incident Commander.

["The incident commander shall assign intermediate levels of supervision and organize resources following standard operating procedures based on the scale and complexity of operations." NFPA 1561, *Standard on Fire Department Incident Management System*, Chapter 5.13.2.2.]

Hose crew did not remain together. As conditions deteriorated inside the building and firefighters began leaving the hose line, the team did not exit the building as one group. Crews remaining together can maintain accountability, exit as a team, and facilitate their safe escape from a building while minimizing the risk of injury.

["Members (of the fire department) shall be responsible for following personnel accountability system procedures." NFPA 1561, *Standard on Fire Department Incident Management System*, Chapter 4.8.5.]

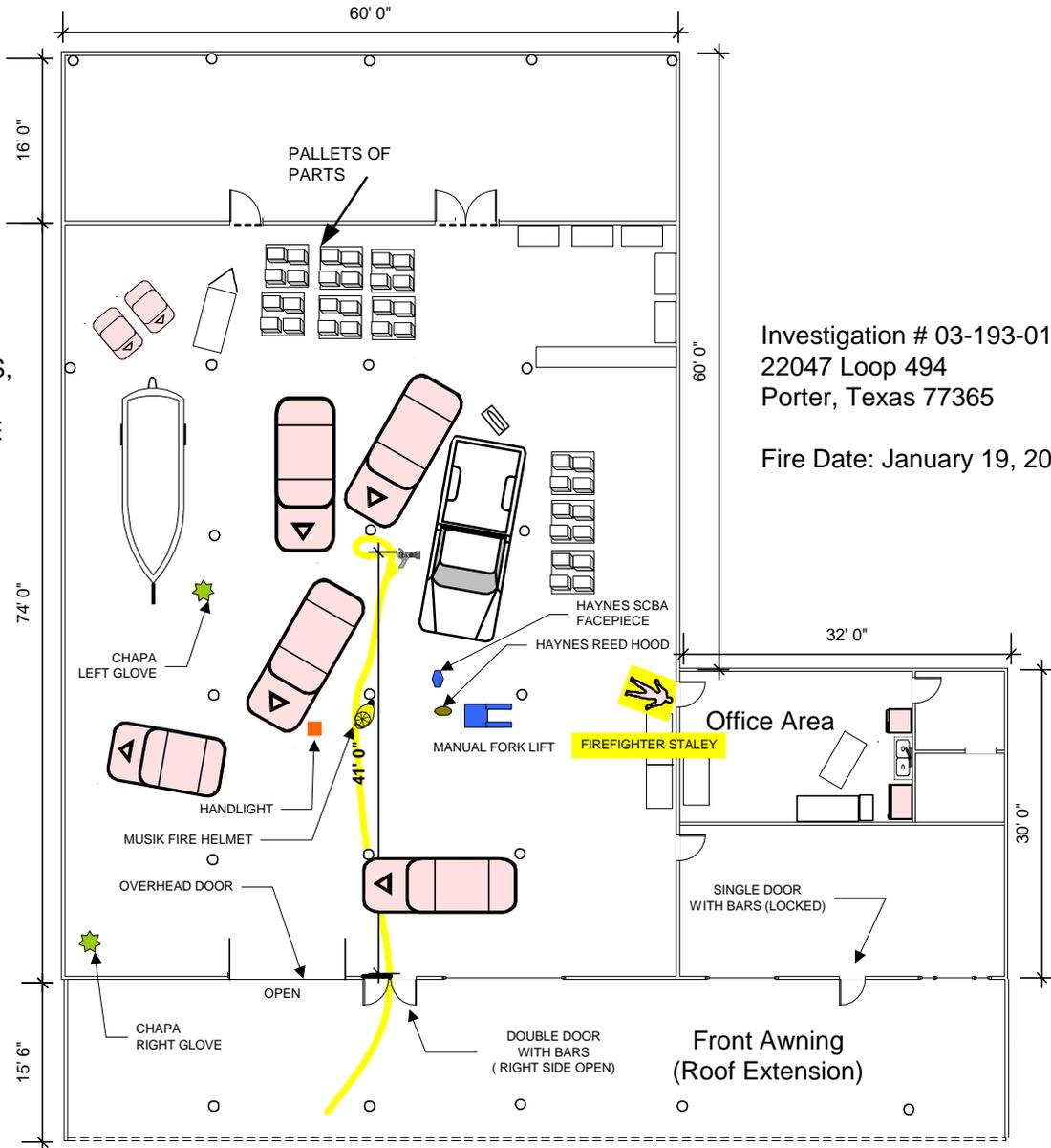
- **Communications:** The hose crew did not communicate with command. The initial attack team did not keep the Incident Commander advised of the interior conditions encountered, actions being taken or additional resources needed.

["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." NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, Chapter A.8.1.8 (3).]

No "MAYDAY" signal was transmitted by any member of the hose team as conditions deteriorated within the building. The hose team was equipped with only one portable radio. Every firefighter should have personal radio communications equipment while operating in the "hot zone." Communications is essential for effective fireground operations. During this incident, the lack of personal radio equipment contributed to the lack of vital information being communicated to the Incident Commander. The trapped firefighter was unable to radio his position, his situation, or a "MAYDAY" signal.



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