

Fire Investigation Summary

Retail Store Fire

Mableton, Georgia
October 26, 1997



A fire in a sprinklered retail store highlighted the hazardous associated with the improper storage of LP cylinders within the building. A leak from one of the cylinders created a gas cloud that was then ignited, seriously damaging the buildings sprinkler system. The ensuing fire and additional explosions totally destroyed the store and its contents.



National Fire Protection Association
Fire Investigations Department

At approximately 1:00 a.m. on October 26, 1997, an explosion occurred in an 86,400 square foot (8,026.6 m²) mercantile store in Mableton, Georgia. At the time of the incident, the store was occupied by four people who were cleaning and restocking. It was not open to the general public at that time.

A general merchandise retail facility, the store measured 240 feet by 360 feet (73 m x 110 m) and was one story high, measuring 20-22 feet (6.1-6.7 m) in height. Its exterior walls were constructed of masonry block and supported lightweight steel trusses. Its roof was composed of corrugated steel deck and was covered by a layer of fiberboard, which in turn was covered by a layer of expanded foam insulation. Over this lay a black, rubberlike membrane covered with gravel.

Within the sales floor area of the store hung a suspended acoustical tile ceiling. The area within the stockroom was open to the roof deck. A second stockroom located in the southwest portion of the store housed a propane-fueled fork truck. Five spare 40-pound cylinders of propane were also stored in this area.

The building was equipped with a sprinkler system in the occupied spaces. Sprinkler protection in the noncombustible void space above the suspended ceiling was lacking, however. The sprinkler system was equipped with flow switches that were monitored by a central station alarm company.

The Cobb County Fire and Emergency Services, notified of an alarm sounding by the alarm monitoring company, initiated a standard, two-engine response to the incident. Shortly thereafter, the occupants of the store called to report the explosion. Additional companies were then dispatched to the incident.

The first arriving company (E1) responded to the front door of the store and reported that nothing was visible from the exterior of the building. Upon entering the building the officer observed that some ceiling tiles had been knocked down and that some stock had fallen to the floor. He walked through the sales floor to the area of the stockroom that the employees reported an explosion had occurred.

After entering the stockroom, the officer observed that the rear wall had been knocked out, and he reported that there was possibly a fire behind the building. Water from the sprinkler system was flowing across the floor in the area. He then returned to his engine company by the front door, had the four occupants removed from the building, and, based on his observations, planned to attack the fire with a preconnected handline.



A second company (Engine 9) responded to the southeast corner of the store and, using the wall post indicator valves, shut down the sprinkler system because of the damage to the sprinkler system. As his crew carried out this task, the company officer walked farther west to assess the damage. He observed that 150

feet (46 m) of the south wall in the southwest corner had been blown out into the driveway and that the roof was sagging. In addition, a 40-foot (12-m) storage trailer adjacent to the building had been blown over on its side by the force of the explosion. The officer determined that the fire in the loading dock area could be handled by handlines if the company attacked it quickly. He ordered his engine company to move farther west and to advance a handline to attack the fire from the rear. Another engine company (Engine 22) was ordered to establish a water supply for this company. Engine 22 advanced a handline as well as a 3-inch supply line to Engine 9's deck gun.



The officer from the first arriving company (E1) passed command to the Ladder 1 captain, who was located at the front of the store. The Engine 1 officer then looked back into the store and observed a fire in the building. He and his crew then re-entered the stores with a crew advancing a handline. As the officer entered the building he immediately removed a ceiling tile with a pike pole and reported that black smoke and moderate heat escaped the void space. The officer advanced a little farther and removed another tile and experienced the same result. Feeling that he and his crew were in a dangerous position with a fire above them, the officer ordered his personnel to exit the structure.

A defensive fire attack was initiated using master streams from two ladder companies and three portable monitors. Personnel report that within 30 minutes the roof began to fail in the southwest corner of the building, and shortly thereafter large sections of the roof collapsed. During fire-fighting operations, several explosions that have been attributed to the



spare propane cylinders BLEVEing occurred in the area of the stockroom.

The fire burned for approximately 2 hours, until it was declared under control at 0305 hours. The entire building and contents were destroyed by the initial explosion and subsequent fire and explosions.

At 4:30 a.m., a curb-box type valve that controlled a portion of the local domestic and fire protection water supply to the store was found to be closed by the local water authority.



Investigators for the Cobb County Fire and Emergency Services and the Metro Fire Investigations Task Force determined that the cause of the explosion and ensuing fire was a propane leak from one of the tanks in the stockroom. The leaking cloud was ignited by an ignition source in the area.

Based on NFPA's investigation and analysis of this fire, the following factors are considered to have contributed significantly to the loss of property in this incident:

- Improper storage of propane cylinders within the occupancy
- Failure of one of the cylinders, which created the cloud of propane gas
- A closed water valve, which limited the available water supply to the sprinkler system and fire streams

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The National Fire Protection Association's Fire Investigations Department documents some of the most significant fires and incidents throughout the world. The objective of these investigations is to determine what lessons can be learned from these incidents. This information is then made available to the fire safety community to be used in developing future codes and standards. A complete listing of reports is available, either upon request or can be viewed on our web page.

NFPA Fire Investigations Department

One Batterymarch Park
Quincy, MA 02269 USA
617-984-7467 (tel)
617-984-7056 (fax)
investigations@nfpa.org
www.nfpa.org/investigations.html

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