



ROOMING HOUSE FIRE
Massapequa, NY
August 23, 1986

Includes:
Rooming House Fire Claims Five Lives
By Greg Kyte
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FIRE
INVESTIGATIONS

NATIONAL FIRE PROTECTION ASSOCIATION

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NATIONAL FIRE PROTECTION ASSOCIATION INTERNATIONAL

Fire Investigation Report

Rooming House Fire
Massapequa, New York
August 23, 1986

Prepared By

Greg Kyte

Fire Protection Specialist

ABSTRACT

At approximately 4:30 am on August 23, 1986, a fire occurred in a rooming house located in the Village of Massapequa on Long Island, New York. This fire claimed the lives of four residents and resulted in heavy damage to the wood frame structure.

The Nassau County Fire Marshal's Office has determined the fire to be incendiary in nature. Although the facility had operated over 10 years, its existence was not known by code enforcement officials, it was not licensed, and, consequently, no inspections had been conducted.

The significant factors contributing to the loss of life in this incident are considered to be:

- The ignition scenario;
- Delayed detection of the fire due to an inadequate fire detection system;
- The spread of products of combustion throughout the building by means of the open stairway;
- The combustibility of the interior finish;
- A delay in notifying the fire department.

Introduction

The National Fire Protection Association investigated the rooming house fire which occurred in Massapequa, New York, in order to document and analyze significant factors that resulted in the loss of life. Greg Kyte, Fire Protection Specialist in the NFPA Fire Investigations and Applied Research Division, traveled to Massapequa to document the facts related to this incident.

This is another of NFPA's studies of incidents having particularly important educational or technical interest. The information presented is based on the best data available immediately after the fire and that obtained during subsequent follow-up. It is not the NFPA's intention that this report pass judgment on, or fix liability for, the loss of life that occurred in this incident.

The cooperation and assistance of Robert J. Doran, Thomas E. Tilley, and Joseph J. Schweitzer of the Nassau County Fire Marshal's Office; Chief Marvin Houle, Assistant Chiefs Michael Coogan, Thomas Pendergast, and Gary Persichetti of the Massapequa Fire Department; and Anthony R. Granito, Executive Director of the Nassau County Vocational/Educational and Extension Boards are greatly appreciated.

Public Protection

Nassau County, of which the Village of Massapequa is a part, has a land area of 280 square miles with a population of 1 1/2 million. Fire protection is provided by 10,000 fire fighters divided among 71 predominantly volunteer fire departments. Overall coordination of emergency forces is provided by the Nassau County Fire Commission. The County Bureau of Fire Communications (Firecom) provides computer-assisted central dispatch to local fire departments and facilitates an effective mutual aid system countywide.

Responsibility for enforcement of fire regulations is shared by local fire departments and the Nassau County Fire Marshal's Office. Fire protection for the Village of Massapequa, population 90,000, is provided by the 245-member Massapequa Fire Department. The fire fighting force is fully volunteer and operates 3 stations with (5) 1250 GPM pumpers, (1) 1000 GPM pumper, (1) 85' ladder, (1) 75' tower ladder, (3) ambulances, (1) heavy rescue truck, and (1) fire/police van.

Background

The Village of Massapequa requires rooming houses with more than 10 boarders to be licensed in order to ensure compliance with zoning and fire safety regulations. Reports indicate that 11 boarders in addition to the owner were residing at the rooming house located at 357 Ocean Avenue.

Enforcement of fire safety regulations is a responsibility shared by the local government and the county fire marshal's office. Although the facility had operated over 10 years, its existence was not known by code enforcement officials, it was not licensed, and, consequently, no inspections had been conducted.

This was not the first time the Massapequa Fire Department had responded to the rooming house on the report of a fire. On two previous occasions, once in 1982 and again in 1985, fires allegedly the result of careless smoking occurred in the facility.

Constructed in the Victorian style of architecture around the turn of the century, the large 3-story wood frame structure was originally used as a single family dwelling. Original exterior wall coverings were comprised of combustible wood shingles that were later concealed in part by asphalt-impregnated siding and, in some areas, aluminum siding resembling brick. A porch extended across the front and partially down each side of the house.

Egress from the building was provided by four doors located on the front, rear, and two sides of the first floor level.

Interior wall and ceiling finishes were originally of wood lathe and plaster; however, many of the surfaces had been subsequently covered with combustible finish materials. In general, cellulose-based, combustible ceiling tiles attached by wood strapping to the original plaster ceilings were prevalent throughout. Plastered wall surfaces had been covered with thin combustible wood paneling in many areas of the interior. In addition, many areas were finished with a wood wainscot that ran to at least 36 inches above the floor.

Centrally located in the house was an open stairway that connected all three floors and constituted the only escape route for 2nd and 3rd floor occupants in the event of a fire. A much smaller stairway in the rear of the house provided access from the first floor only, to a partial basement sometimes used to house tenants.

The first floor was divided approximately in half with one side serving as residence for the 87-year-old owner and the other, for a male tenant, age 55. The second floor was comprised of four sleeping rooms and 1 bathroom. Two females, ages 46 and 58, shared one room; and two males, ages 25 and 31, shared another room. A third room was occupied by a 75-year-old male and the fourth room by a female tenant, age 18. The third floor was also comprised of four sleeping rooms and 1 bathroom. Three males, ages 33, 54, and 62, occupied separate rooms on the third floor. The fourth room was occupied by a female boarder, age 18.

On the second and third floors, guest rooms opened onto a hallway that was directly exposed to the open stairway. The wood panel guest room doors did not have self-closing devices. The non-sprinklered facility was provided with one single-station, battery-operated smoke detector, installed on the sloping

ceiling in the open stairway between the 2nd and 3rd floors. A second smoke detector of the same type was installed high on the wall in the smaller rear stairway that led from the first floor to the basement.

Fire Incident

Eleven persons, including the building owner, were asleep in the rooming house at the time of the fire on August 23rd. A twelfth resident, who normally occupied a portion of the first floor, was not present on that night.

In the early morning hours, a neighbor awoke and saw fire at the rooming house. He reported the fire by telephone at 4:42 a.m. and first-due companies were dispatched immediately thereafter.

The duty chiefs were first to arrive on the scene at 4:48 a.m., followed soon thereafter by the chief of the department. One of them reported that the porch was fully involved at the front entranceway and flames were visible through second and third floor windows.

By this time, the sole occupant of the first floor had escaped by way of the rear exit and two upper floor residents had been rescued from the porch roof by neighbors using a ladder.

"First-in" fire apparatus arrived on the scene at 4:50 a.m. Supply lines were laid to a fire hydrant located an estimated 800 feet away. As a permanent water supply was being established, (2) 1 3/4-inch pre-connected handlines were supplied from a booster tank. Two additional ambulances from the communities of Seaford and North Massapequa provided mutual aid assistance.

At least two other building occupants, who had escaped the rapidly developing fire by crawling out of the third floor windows onto the roof, were still awaiting rescue. Reports from building occupants indicated that additional persons were trapped inside the burning structure.

With rescue of occupants as a priority, arriving fire fighters were ordered to ladder the building. Fire at that time involved most of the first floor and had extended by the unenclosed stairway to upper floors.

The first to be rescued by fire fighters were the residents that remained on the roof. Realizing the difficult task of locating and rescuing the other five persons who were still inside, a two-part strategy was implemented. First, utilizing ground ladders, fire fighters gained access to the 2nd floor to conduct search and rescue. Second, an interior attack was made on the fire on the first floor in an attempt to stop the progress of the fire and possibly reach those trapped inside. A 2 1/2-inch and a 1 3/4-inch handline were taken through the main entrance, and a 1 3/4-inch handline was brought into the west side entrance. Crews on the handlines managed to momentarily darken the fire. However, because most of the rooming house was heavily involved with fire at that time, flames rapidly intensified forcing fire fighters to withdraw. One fire fighter on the porch roof was injured when he fell to the ground and landed on his SCBA. Another fire fighter received burns on his ears while mounting the interior attack on the fire.

Fire fighters utilizing ground ladders to reach the second floor for search and rescue met with some success. Two occupants who shared a second floor room were observed at their window. The room was involved, and as the seconds ticked by, the chances of survival for the occupants were greatly diminished. Fire fighters quickly positioned a ladder under the window and made their ascent to rescue them. For reasons not known, one of the occupants disappeared from view as she began walking toward the fire. The other occupant, however, was successfully removed to the ground from her room where she was rushed to a hospital for treatment of burns.

Since a second interior attack on the fire was not possible, two master streams were put into service. A tower ladder using a straight tip nozzle was positioned in the front of the building along with a deluge set anchored to the ground. As both master streams were put into service, water supply problems were experienced. Although water was being furnished from pumpers

located on different hydrants, they were connected to the same 6-inch main. To remedy the situation, a 4th pumper was connected to a hydrant on a different water main and a line stretched by hand to the fire scene. Also during this time, a pumper from the North Massapequa Fire Department was dispatched to man one of the empty fire stations to provide back-up in the event of another fire.

Large amounts of water continued to be applied and, by 6:30 a.m., the fire was brought under control. In all, over 75 fire fighters with 4 engines, 2 ladders, 1 heavy squad, and 4 ambulances were present to conduct suppression and rescue operations.

Property Damage and Fatalities

Damage to the structure was considerable with all portions subjected to the effects of heat and smoke. The entire roof and third floor were lost during the fire with the second and first floor levels receiving considerable damage as well.

Of the portions of the building that remained standing, clearly the first floor living room and open stairway received the most severe damage. Damage also occurred to the building exterior as fire extended vertically from out of window and door openings .

After final extinguishment of the fire, two victims were located on the second floor. They were later identified as a 58-year-old female and a male, age 75. On the third floor level, two additional bodies were discovered. It was later determined that both victims were males, ages 62 and 54.

At least one of the building residents received lacerations during her escape from the roof of the building and a number of fire fighters also received injuries while combating the fire and performing rescue operations.

Analysis

The cause of the fire has been determined by the Nassau County Fire Marshal's Office to be incendiary in nature. Within 24 hours of the fire

occurrence, a former resident of the rooming house was apprehended, arrested, and charged with 4 counts of murder and 1 count of arson. Due to the impending prosecution, specific ignition details are unavailable at this time.

It is known, however, that the fire originated on the front porch beneath one of the windows that opened onto the living room. Once ignited, the fire began to involve the asphalt-impregnated exterior wall covering. The fire extended vertically until flames reached the wooden porch ceiling and then started to spread to other combustible material. Within minutes, the entire porch area was engulfed in flames.

In the early stages of the fire, flames entered the open living room window igniting curtains and other decorative wall hangings. As more fuel was consumed by the fire, the heat generated caused temperatures in the room to rise rapidly. At the same time, smoke and toxic gases were being produced in great quantities. Before long, the entire living room was involved in fire and flames were quickly spreading to adjacent rooms on the first floor and up the open stairway located nearby. Besides the typical room furnishings that are normally present in such occupancies, the fire was also fueled by wood wainscoting, combustible ceiling tiles*, and thin wood paneling. Once the fire reached the open stairway, it ignited these wall and ceiling finish materials.

The open interior stairway allowed the fire and products of combustion to travel to the second floor and then quickly to the third floor. The resulting heat and smoke in the hallways created untenable conditions in the only means of egress for residents. This was further evidenced by the fact that no person escaped the building by way of the stairway during the fire.

*Combustible ceiling tiles in this fire appeared to be similar to those identified and tested during previous fire investigations of residential occupancies. Typically manufactured of low-density fiberboard, these materials have normally received flame spread ratings of 200 or greater.

At some point during the fire, a battery-operated, single-station smoke detector located on the sloping stairway ceiling between the 2nd and 3rd floor activated. This was confirmed by discussions with 2nd and 3rd floor occupants.

In two accounts, occupants reported being wakened by the detector alarm signal. Upon investigation of conditions outside their quarters, both residents reported the hallway and stairs blocked by flames and dense, acrid smoke. In each case, the occupant was forced to evacuate the burning building by climbing through the bedroom window onto the roof to await rescue.

An examination of the second smoke detector located in the smaller stairway that served the basement revealed that it contained no battery, therefore rendering it inoperable.

Summary

Discussions with investigators revealed that the group residing at the rooming house received no personal care.* This determination is essential to the classification of the occupancy and, with no personal care being given, the facility is considered a lodging or rooming house according to Chapter 20 of NFPA 101®, Life Safety Code®.

As previously stated, this facility was never licensed or inspected by local or county fire officials. If inspections had been conducted, the fire safety provisions for lodging or rooming houses contained in the Life Safety Code® would have been enforced. Two areas of major importance would have been addressed by the Code. First, the early detection of the fire and, second, limiting the vertical spread of smoke and toxic gases in the building.

*Personal care means protective care of a resident who does not require chronic or convalescent medical or nursing care. Personal care involves responsibility for the safety of the resident when in the building. (Reference: Paragraph 21-1.3, NFPA 101®, Life Safety Code®.)

Paragraph 20-3.1 of the Code requires that open stairways be enclosed in construction that can resist the passage of smoke and flames. In this incident, there is little doubt that enclosure of the stairway would have increased the probability of surviving in the fire.

Paragraph 20-3.3 of the Code specifies that smoke detectors be provided in all common areas with at least one present on each level of the building. In addition, a fire alarm system must be present which has the capability to be manually activated and to sound an alarm which would be audible throughout the facility.

The fire alarm was significantly delayed because of the distance between the fire and the smoke detector. Compliance with the Code would have resulted in a smoke detector being located in the living room, allowing for a faster alarm activation. This, in turn, would have likely given occupants additional time to escape early in the fire when tenable conditions still existed.

Although other conditions such as the ignition scenario and a highly combustible interior finish compounded the problems experienced during this fire, enclosure of the stairway coupled with an adequate detection system would have most likely altered the outcome.

The following are considered to be significant factors contributing to the loss of life in this fire:

- The ignition scenario;
- Delayed detection of the fire due to an inadequate fire detection system;
- The spread of products of combustion throughout the building by means of the open stairway;
- The combustibility of the interior finish;
- A delay in notifying the fire department.

Four residents of this Massapequa, N.Y., rooming house died in a fire that broke out at approximately 4:30 a.m. on August 23, 1986. A fifth victim died in a hospital several weeks after the fire. Photo by Jack Healy/LIFPA.

Acknowledgements

The National Fire Protection Association investigated the rooming house fire in Massapequa, New York, to document and analyze significant factors that resulted in the loss of life. Greg Kyte, Fire Protection Specialist in the NFPA Fire Investigations and Applied Research Division, traveled to Massapequa to document the facts related to this incident.

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The fire building

The large, three-story wood frame structure at 357 Ocean Avenue originally had been used as a single family dwelling. It was built in the Victorian style of architecture around the turn of the century. The original exterior walls of combustible wood shingles had been concealed in part by asphalt impregnated siding and in part by aluminum siding that resembled brick. A porch extended across the front and partially down each side of the house. Four doors, on the front, rear and both sides, provided exit discharge from the first floor level. Inside, an open stairway in the center of the house connected all three floors. It was the only escape route for second and third floor residents. A smaller stairway in the rear of the house provided access from the first floor to a partial basement, where tenants sometimes were housed.

The interior wall and ceiling finishes were of wood lath and plaster; however, many surfaces had been covered subsequently with combustible finish materials. In general, the original plaster ceilings had cellulose-based, combustible ceiling tiles attached by wood strapping throughout the building. Many areas of the plastered wall surfaces had been covered

with thin combustible wood paneling and many areas also were finished with a 36-inch-high wood wainscot.

The first floor was divided about in half, with one side serving as a residence for the 87-year-old building owner, and the other housing a male tenant, age 55. The second floor had four sleeping rooms and a bathroom. Two females, ages 46 and 58, shared one room, and two males, ages 25 and 31, shared another room. The third and fourth rooms were occupied by a male tenant, age 75, and a female tenant, age 18. The four rooms on the third floor, which also had a bathroom, housed a female boarder, age 18, and three male boarders, ages 33, 54, and 62, each in separate rooms.

The second and third floor rooms opened onto a hallway that was exposed directly to the open stairway. The wood panel doors to the rooms did not have self-closing devices. The facility was un-sprinklered. Two single station, battery-operated smoke detectors were provided, one on the sloping ceiling of the open stairway between the second and third floors, and one high on the wall of the smaller, rear stairway to the basement.

Rooming House Fire Claims Five Lives

GREG KYTE

Fire Protection Specialist
NFFPA Fire Investigations and Applied
Research Division

A pre-dawn fire in a rooming house in Massapequa, Long Island, N.Y., on August 23, 1986, claimed the lives of four residents. A fifth victim died several weeks later, on October 11, 1986, bringing the toll to five. Although the facility had operated for more than 10 years, its existence was not known to code enforcement officials. It was not licensed; consequently, no inspections had been conducted.

The Nassau County Fire Marshal's Office has determined the fire to be incendiary in nature.

The Village of Massapequa requires rooming houses with more than 10 boarders to be licensed to ensure compliance with zoning and fire regulations. Reports indicate that 11 boarders, in addition to the owner, were residing at the rooming house at 357 Ocean Avenue in Massapequa.

This was not the first time the Massapequa Fire Department had responded to the rooming house on the report of a fire. On two previous occasions, in 1982 and 1985, fires that allegedly were caused by careless smoking had occurred in the facility.

The fire incident

Eleven persons, including the building owner, were asleep in the rooming house on August 23. A twelfth resident, who normally occupied a portion of the first floor, was absent that night.

A neighbor awoke in the early morning hours and saw fire at the rooming house. He reported the fire by telephone at 4:42 a.m. First-due companies were dispatched immediately thereafter.

On-duty fire personnel were first to arrive on the scene, at 4:48 a.m., and one of them reported that the porch was fully involved at the front entrance and that flames were visible through second and third floor windows. The chief of the department arrived soon after.

By this time, the sole occupant of the first floor had escaped by way of the rear exit, and two upper floor residents had been rescued from the porch roof by neighbors using a ladder.

Fire fighters use ground ladders to gain access to upper floors, to conduct search and rescue operations. The front porch was fully involved and flames were visible at second and third floor windows when first-in fire personnel arrived. Several fire fighters were injured during fire and rescue operations. Photo by Richard Gunther.

First-in fire apparatus arrived at 4:50 a.m. and laid supply lines to a fire hydrant located an estimated 800 feet away. As a permanent water supply was being established, two 1¾-inch preconnected handlines were supplied from a booster tank. Two additional ambulances from the communities of Seaford and North Massapequa provided mutual aid assistance.

At least two other building occupants had escaped the rapidly developing fire by crawling out third floor windows onto the porch roof. They were still awaiting rescue. Building occupants indicated that more people were trapped inside the burning structure.

With rescue as a priority, arriving fire fighters were ordered to ladder the building. At that time, fire involved most of the first floor and had extended to upper floors via an unenclosed stairway (see sidebar, "The fire building").

The residents on the roof were the first to be rescued by fire fighters. Realizing the difficult task of locating and rescuing the other five persons who were still inside, the fire department implemented a two-part strategy. First, fire fighters used ground ladders to gain access to the second floor to conduct search and rescue. Second, they made an interior attack on the first floor, in an attempt to stop the progress of the fire and possibly to reach those trapped inside. They took 2½-inch and 1¾-inch handlines through the main entrance and a 1¾-inch handline through the west side entrance. The handline crews managed to darken the fire momentarily. However, because most of the rooming house was heavily involved with fire at that time, flames intensified rapidly and forced fire fighters to withdraw. One fire fighter on the porch roof was injured when he fell to the ground and landed on his SCBA. Another received burns on his ears during the interior attack.

Fire fighters who had used ground ladders to reach the second floor for search and rescue met with some success. Two occupants who shared a second floor room were observed at their window. The room was involved and, as the seconds ticked by, the occupants' chances of survival were greatly diminished. Fire fighters quickly positioned a

The fire marshal and a policeman gather information at the fire scene. Photo by Jack Healy/LIFPA.

ladder under the window and went up to rescue them. For reasons not known, one occupant began walking toward the fire and she disappeared from view. The other occupant was removed to the ground and rushed to a hospital for treatment of burns.

Since a second interior attack on the fire was impossible, two master streams were put into service. A tower ladder with a straight tip nozzle was positioned in front of the building, and a deluge set was anchored to the ground. As both master streams were put into service, water supply problems were experienced. Although water was being supplied from pumpers located on different hydrants, they were connected to the same 6-inch main. To remedy the situation, a fourth pumper was connected to a hydrant on a different water main, and a supply line was stretched by hand to the fire scene. Meanwhile a pumper from the North Massapequa Fire Department was dispatched to man one of the empty fire stations and to provide back-up in the event of another fire.

Crews continued to apply large amounts of water and the fire was brought under control by 6:30 a.m. In all, more than 75 fire fighters responding with four engines, two ladders, one heavy squad, and four ambulances took part in suppression and rescue operations.

Property damage and fatalities

The entire roof and third floor of the building were lost during the fire, and damage to the second and first floor levels was heavy.

Of the portions of the building that remained standing, clearly the first floor living room and open stairway re-

ceived the most severe damage. The exterior of the building also was damaged as the fire had extended vertically from window and door openings.

After final extinguishment of the fire, two victims were located on the second floor. They later were identified as a 58-year-old female and a male, age 75. Two additional bodies discovered on the third floor level were determined to be male victims, ages 62 and 54.

At least one resident received lacerations during her escape from the roof of the building. Several fire fighters also received injuries while combatting the fire and performing rescue operations.

Analysis

The Nassau County Fire Marshal's Office has determined the fire cause to be incendiary in nature. Within 24 hours of the fire, a former resident of the rooming house was apprehended, arrested, and charged with four counts of murder and one count of arson. Because of the impending prosecution, specific ignition details are unavailable at this time.

It is known, however, that the fire originated on the front porch beneath one of the windows that opened onto the living room. Following ignition, fire involved the asphalt-impregnated exterior wall covering, extending upward until flames reached the wooden porch ceiling. Fire then started to spread to other combustible material. Within minutes, the entire porch area was engulfed in flames.

In the early stages of the fire, flames entered the open living room window, igniting curtains and other decorative wall hangings. As the fire consumed more fuel, the heat caused temperatures in the room to rise rapidly. At the same time, smoke and toxic gases were pro-

Emergency medical technicians stabilize a resident lying on a car hood. She jumped to safety. Photo by Jack Healy/LIFPA.

duced in great quantities. Before long, the entire living room was involved, and flames were spreading quickly to adjacent rooms on the first floor and up the nearby open stairway. Besides the typical room furnishings present in such occupancies, the fire also was fueled by wood wainscotting, thin wood paneling, and combustible ceiling tiles. (Combustible ceiling tiles in this fire appeared to be similar to those identified and tested during previous fire investigations of residential occupancies. Typically cellulose-based, these materials normally have received flame spread ratings of 200 or greater.) Once the fire reached the open stairway, it ignited the walls and ceiling finish materials.

The open interior stairway allowed the fire and products of combustion to

travel to the second floor and then quickly to the third floor. The resulting heat and smoke created untenable conditions in the hallways, the only means of egress for residents. This was further evidenced by the fact that during the fire no one escaped by the stairway.

At some point during the fire, a battery-operated, single-station smoke detector on the sloping stairway ceiling between the second and third floors activated. This was confirmed in discussions with occupants of those floors.

In two accounts, occupants reported being awakened by the detector alarm signal. Both residents reported that the hallway and stairs outside their quarters were blocked by flames and dense, acrid smoke. In each case, the occupant was forced to leave the burning building by climbing through a bedroom window onto the roof to await rescue.

Examination of the second smoke detector, in the smaller, rear stairway to the basement, revealed that it had no battery and therefore was inoperable.

Summary

Discussions with investigators revealed that residents of the rooming house received no personal care. (Personal care means protective care of a resident who does not require chronic or convalescent medical or nursing care. Personal care involves responsibility for the safety of the resident when in the building. See paragraph 21-1.3, NFPA®, *Life Safety Code*®, 1985 edition.) This determination is essential to the classification of the occupancy; with no personal care being given, the facility is considered to be a lodging or rooming house, according to Chapter 20 of NFPA 101, *Life Safety Code*.

As previously stated, this facility was never licensed or inspected by local or

county fire officials. If inspections had been conducted, the fire safety provision for lodging or rooming houses contained in the *Life Safety Code* would have been enforced. The Code would have addressed two areas of major importance: first, the early detection of fire and, second, the limiting of the vertical spread of smoke and toxic gases in the building.

Paragraph 20-3.1 of the Code requires that open stairways be enclosed in construction that can resist the passage of smoke and flames. In this incident, there is little doubt that enclosure of the stairway would have increased the probability of surviving the fire.

Paragraph 20-3.3 of the Code specifies that smoke detectors be provided in all common areas, with at least one present on each level of the building. In addition, the Code requires the presence of a fire alarm system which has the capability to be manually activated and to sound an alarm that would be audible throughout the facility.

The fire alarm was delayed significantly because of the distance between the fire and the smoke detector. Compliance with the Code would have resulted in a smoke detector being present in the living room, allowing for faster alarm activation. This, in turn, likely would have given occupants additional time to escape early in the fire, when tenable conditions still existed.

Although other conditions such as the ignition scenario and a highly combustible interior finish compounded the problems experienced during this fire, enclosure of the stairway, coupled with an adequate detection system, probably would have altered the outcome.

The following are considered to be significant factors contributing to the loss of life in this fire:

- The ignition scenario;
- Delayed detection of the fire due to an inadequate fire detection system;
- The spread of products of combustion throughout the building by means of the open stairway;
- The combustibility of the interior finish;
- A delay in notifying the fire department.

Public fire protection

Massachusetts situated in Nassau County, Virginia has a land area of 200 square miles with a population of 100 million. County fire protection is provided by 10,000 fire fighters, divided among 11 predominantly volunteer fire departments. Overall coordination of emergency forces is provided by the Nassau County Fire Commission. The County Bureau of Fire Communications (Firecom) provides computer-assisted central dispatch to local fire departments and facilitates an effective countywide mutual aid system.

Responsibility for enforcement of fire regulations is shared by local fire departments and the Nassau County Fire Marshal's Office. Fire protection for Massachusetts, population 90,000, is provided by the 245-member, all-volunteer Massachusetts Fire Department, which operates three stations with five 1250 gpm pumps, one 1000 gpm pump, one 85-foot ladder, one 75-foot tower ladder, three ambulances, one heavy rescue truck, and one fire/police van.