

CATASTROPHIC MULTIPLE-DEATH FIRES IN 2011

**Stephen G. Badger
September 2012**



**National Fire Protection Association
Fire Analysis and Research Division**

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Catastrophic Multiple-Death Fires in 2011

In 2011, firefighters in the United States responded to an estimated 1,389,500 fires, 386,000 of which occurred in residential structures, 98,500 in nonresidential structures, and 905,000 outside of structures (see the summary of the “U.S. Fire Loss for 2011” report on page 76 in this issue. These fires accounted for an estimated 3,005 deaths, 2,550 of which occurred in residential structures, 90 in nonresidential structures, and 365 in fires outside of structures.

Twenty-three of these fires were categorized as catastrophic multiple-death fires, defined here as fires or explosions in homes or apartments that result in five or more fire-related deaths, or as fires or explosions in all other structures, as well as outside of structures, such as wildfires and vehicle fires, that claim three or more lives.

These 23 fires resulted in 114 fire deaths, including 16 children under the age of six. They accounted for 0.002 percent of the total estimated fires and 3.8 percent of the total fire deaths for 2011. By comparison, there were 29 catastrophic multiple-death fires in 2010, resulting in 175 deaths, including 30 children under age six.

The worst catastrophic fires each year often claim a dozen or more victims. In 2011, no single fire resulted in losses of that magnitude, but there was an unusually high proportion of catastrophic fires that began with explosions. Six catastrophic multiple-death fires last year were caused by explosions. This is 26 percent of the total number of fires and resulted in 28 deaths, which was 25 percent of the deaths. Two of the victims were children under the age of six. Three of the explosions involved storage properties: a grain elevator, a fireworks storage bunker, and a pipeline near an oil storage tank at an oil well. Two others originated in single-family homes, and one occurred at a steel powder manufacturing plant.

In the 10 years leading up to 2011, 34 explosions were reported in the catastrophic multiple-death study, resulting in 194 deaths. Most notable of those were the West Virginia mine explosion of 2010 that killed 29, the Texas refinery explosion of 2005 that killed 15, and the Georgia sugar refinery explosion of 2008 that killed 14.

Catastrophic Home Fires

Just over half of the catastrophic multiple-death fires in 2011 occurred in homes. Of these 12 fires, eight occurred in single-family homes, one of which was a manufactured home, and one occurred in a duplex. Three catastrophic multiple-death fires also occurred in apartment buildings, one of which had 10 units. The other buildings had 9 units and 8 units. This was seven fewer than occurred in the United States the year before.

There were 67 deaths in home fires in 2011, down from 101 in 2010. Of the 67 fatalities, 11 were children under the age of six; this was 17 fewer than in 2010. Ten of the 12 fires, resulting in 56 of the 67 deaths, broke out between the hours of 11 p.m. and 7 a.m. Nine of the 56 victims were children under six.

The largest-loss-of-life fire in a home killed seven people, including three children under age six. This involved a 2½-story farmhouse of unprotected wood-frame construction. The fire department did not report details of this fire, but state police investigators were extensively quoted in the media as saying that the fire began in a first-floor living room. The mother was in a barn milking cows when the father left to deliver milk, leaving eight children alone in the house. Two of the children, ages two and three, were watching television when the three-year-old saw smoke in the house. She ran to the barn to alert her mother, who yelled to a neighbor to call 911 and ran to tell her husband, who had stopped to nap in his truck about a mile (1.6 kilometers) from the house. The three-year-old was the only child to survive.

Another five fires killed six people each, including two children under age six. The first fire, the cause of which could not be determined, broke out in the master bedroom of a double-wide manufactured home. The victims were found at various points in the home, leading investigators to believe that at least four had tried to escape. Smoke alarms had been installed, but investigators could not determine whether they operated.

The second fire was intentionally set in the living/dining area of a single-family home during a murder/suicide. All six victims were found in the living/dining area. The house had no smoke alarms.

The third fire of undetermined cause broke out in the living room of a first-story apartment in a 10-unit building. Someone in the apartment of origin left the unit's door open, allowing the fire to spread to upper stories by way of the open stairwell and trap six victims in two different apartments on the second floor. The building's smoke alarms operated.

The fourth fire, which was started by a charcoal grill left unattended on a wooden rear porch, spread up the building's vinyl siding, through the eaves, and into the bedrooms on the second story. Firefighters found four children in two bedrooms on the second floor and two adults on the first floor, one in the living room and one in a bedroom. There were no smoke alarms.

The fifth fire occurred when heat from a hot water tank ignited leaking propane in the basement of a single-family house, and the propane exploded. The house had no smoke alarms.

Six additional fires killed five people each. Six children under age six died in these fires; one fire alone killed three children. The fires occurred in three single-family homes, a duplex, and two apartment buildings, one of which had nine units and the other eight. In three of these fires, the buildings had no smoke alarms. In two, smoke alarms were present, although one did not operate because its battery was missing, and investigators did not know if the system operated in the other. No information on smoke alarms was reported for the sixth fire.

Catastrophic Non-Home Structure Fires

Six of the 23 catastrophic multiple-death fires of 2011 occurred in non-home structures and resulted in 20 fatalities, five of whom were under age six. Three of these fires were started by explosions, two in storage properties—a fireworks storage bunker and a grain elevator—and one in a steel and iron powder manufacturing plant. There were also fires in a day care center, a

residential board-and-care facility, and a bed and breakfast. In 2010, eight non-home structure catastrophic multiple-death fires resulted in 63 deaths.

Three of the six fires in non-home properties last year broke out between 11 p.m. and 7 a.m., and killed 14 people, including a child under six.

Two of the six fires killed six people each. The first was started in a three-story bed and breakfast of unprotected wood-frame construction by a candle left unattended in a room on the first floor. One victim was found on the first floor, and the other five were found at various locations on the second floor. One of the victims was three years old. The bed and breakfast had smoke alarms, which operated and alerted the occupants. The fire department report did not say why the victims were unable to escape.

The second fire began when grain dust exploded in a 12-story grain elevator of protected noncombustible construction. The cause of the explosion was not determined. Three of the victims were found at different locations outside the building, and the other three were found inside the grain elevator, which did not have smoke alarms.

Another two incidents killed five people each. The first occurred in an underground, World War II-era munitions bunker being used to store fireworks. At the time of the fire, the cause and origin of which could not be determined, six employees were disposing of seized fireworks. One person who was outside the bunker survived.

The second fire, the cause of which was also undetermined, began in a bedroom of a one-story residential board-and-care facility of unprotected wood-frame construction. Four of the victims were found in bedrooms, and the fifth victim's location was not reported.

Four children under the age of six died in a fire at a one-story day care center of unprotected wood-frame construction. The fire began when the day care operator left a frying pan in which cooking oil was heating unattended when she left the facility. The oil caught fire, and flames spread throughout the kitchen. The center had smoke alarms, but one failed to operate because its battery was missing. Investigators could not determine if the other operated. The day care operator was arrested on charges of leaving seven children unattended.

Catastrophic Non-Structure Fires

In 2011, five non-structure incidents killed 18 people. This is three more non-structure fires than occurred in 2010 and seven more deaths.

Three of these catastrophic non-structure fires involved aircraft crashes and fires. Vehicle crashes and fires are included in this study if the fire in the vehicle caused the crash or the local coroner or medical examiner confirms that the victims died of thermal injuries or inhalation of products of combustion, rather than impact injuries.

Each of the aircraft crashes killed four people. The first occurred during takeoff, when the aircraft slid along the runway, spewing sparks and smoke from the bottom of the wing. The airplane became involved in flames, hit several obstructions, and came to rest upright.

The second crash occurred shortly after takeoff. The plane became airborne, then descended and hit a roadway, skipped back into the air, then struck railroad track, and became fully involved in fire.

The third aircraft incident involved a fire that started during a flight, but no specifics were given as to the type of fire or its location. Shortly after the pilot reported a fire on board to the air traffic controller, the plane crashed and burned.

In the fourth catastrophic non-structure fire, a controlled burn in grasslands on private property killed three people when it went out of control as the winds shifted. No additional information was reported.

Finally, two people working on a gas pipeline in a trench and another worker near an oil storage tank died in an explosion and fire that began when something ignited the natural gas. A nearby oil tank also ignited and exploded, filling the trench with fire and trapping the workers.

The Role of Smoke Detection and Suppression Equipment

In six of the 12 catastrophic home fires last year, information was available on automatic smoke detection equipment. Four homes were found to have been equipped with smoke alarms, but only one system operated. One alarm had a missing battery, and investigators do not know if the other two operated. Six homes had no smoke alarms at all. In these fires, 33 people, including five children under the age of six, died. This represents 49 percent of those killed in home fires.

Information on detection equipment was reported for all of the non-home structures. Three had no detection equipment, three had smoke alarms, and one had an unknown type of system. The smoke alarm systems operated in two of the fires, in one of which flames trapped the victims on the upper floors. In the second, no reason was given for the victims' failure to escape. In the third fire, which killed four children under age six, the system failed to operate because it had no battery; a second detector at this location was not heard sounding.

Smoke alarms have proven effective in reducing the risk of death in home fires. The most effective arrangement is interconnected, multiple-station smoke alarms that are supplied by hardwired AC power with a battery backup. These should be located outside each sleeping area, on each level, and in each bedroom. Homeowners should routinely test smoke alarms according to manufacturers' recommendations. NFPA recommends testing home smoke alarms at least monthly. Batteries should also be replaced according to manufacturer's recommendations; conventional batteries should be replaced at least yearly. If an alarm "chirps," a warning that the battery is low, the battery should be replaced right away. All smoke alarms, including alarms that use 10-year batteries and hard-wired alarms, should be replaced when they are 10 years old or sooner if they do not respond properly when tested.

Smoke alarms are only effective if occupants leave the building when they sound. Children should be familiar with the sound of a properly operating smoke alarm and follow a practiced escape plan that emphasizes two exits from any location, as well as a designated meeting place once they have evacuated the structure. Exit drills in the home are part of many schools' curricula. Practicing the plan helps families determine whether children and others readily waken

to the sound of a smoke alarm if it sounds during night, and that, along with assistance for family members who require it, can be factored into the plan. Practicing escape plans, as well as basic fire prevention principles, might have prevented many of the fires and deaths included in this report.

No suppression equipment was reported to have been present in any of the structure fires. This is unfortunate, because sprinklers are proven lifesaving systems across many different kinds of properties, including homes. The risk of dying in a reported fire in your home decreases by about 80 percent when sprinklers are present, and sprinklers reduce the average property loss in home fires by 71 percent per fire. More information about home fire sprinklers is available at [Fire Sprinkler Initiative](#).

Where We Get Our Data

NFPA obtains its data by reviewing national and local news media, including fire service publications. A news clipping service reads all daily U.S. newspapers and notifies the NFPA Fire Analysis and Research Division of catastrophic fires.

Once an incident has been identified, we request information from the local fire department or the agency having jurisdiction. NFPA's annual survey of U.S. fire experience and mailings to the state fire marshals are additional data sources, although not principal ones. We also contact federal agencies that have participated in the investigation of such fires.

The diversity and redundancy of these sources enable us to collect the most complete data available on catastrophic fires throughout the United States. We understand that, in many cases, a fire department cannot release information due to ongoing litigation. In other cases, fire departments have been unable to determine the information we request.

Stephen G. Badger, a fire data assistant with NFPA's Fire Analysis and Research Division, is retired from the Quincy, Massachusetts, Fire Department.

Table 1. Home Structure Fires

Pennsylvania

Date, Time of Alarm, Number of Deaths

March, 11 p.m., 7 (3 under age 6)

Number of Stories, Occupancy Type, Construction Type

This was a two-story, single-family farm house of unprotected wood-frame construction. The ground floor area was not reported.

Smoke Alarm and Other Protection Devices

No information was reported.

Fire Origin and Path

The fire began in the first-floor living room.

Contributing Factors and Victim Locations

The state police were quoted in the media as saying that a woman was in a barn milking cows when her husband left to deliver milk, leaving their eight children alone in the house. Two of the children, ages two and three, were watching television when the three-year-old saw smoke in the house. She ran to the barn to tell her mother, who yelled to a neighbor to call 911 and ran to tell her husband, who had stopped to nap in his truck about a mile (1.6 kilometers) from the house. The three-year-old was the only child to survive.

Texas

Date, Time of Alarm, Number of Deaths

March, 6:06 a.m., 6

Number of Stories, Occupancy Type, Construction Type

This was a double-wide, single-family manufactured home of unprotected wood-frame construction that covered 1,500 square feet (139 square meters). The home was occupied by nine people at the time of the fire.

Smoke Alarm and Other Protection Devices

There was partial coverage of smoke detectors present, but no information was reported on their operation. There was no automatic suppression equipment.

Fire Origin and Path

The fire of undetermined cause broke out in the master bedroom near the foot of the bed. No additional information was reported.

Contributing Factors and Victim Locations

Three people managed to escape the fire. The victims were found in various locations in the structure. It appears as if at least four of the victims tried to escape.

Washington

Date, Time of Alarm, Number of Deaths

April, 1:39 a.m., 6

Number of Stories, Occupancy Type, Construction Type

This was a one-story, 1,925-square-foot (179-square-meter), single-family home of unprotected wood-frame construction, and it was occupied by one adult and five children.

Smoke Alarm and Other Protection Devices

There were no smoke alarms or automatic suppression system.

Fire Origin and Path

This incendiary fire was set in the living/dining area of this sparsely-furnished home as a murder/suicide. According to an Bureau of Alcohol, Tobacco and Firearms investigation report, gasoline and lighter fluid were spread on the floor throughout the dining/living area and on the walls. The floors in the area were non-absorbent wood laminate, which caused the liquids to pool, creating a large surface area of gasoline that produced vapors. Natural air currents and the functioning hot air furnace caused the vapors to disperse and mix, resulting in a fuel rich mixture at the floor. The introduction of an open flame resulted in a deflagration with an over-pressure event.

Contributing Factors and Victim Locations

When firefighters arrived, the house was 50 percent involved in fire, and a rear wall was pushed out. A primary search of the uninvolved area revealed no one. All six victims were found in the dining/living area, where they had been sleeping in a tent set up for the children.

Illinois

Date, Time of Alarm, Number of Deaths

May, 4:06 a.m., 6 (1 under age 6)

Number of Stories, Occupancy Type, Construction Type

This was a three-story, 10-unit apartment building of unprotected ordinary construction that covered 4,800 square feet (446 square meters). The building was occupied by more than 35 people.

Smoke Alarm and Other Protection Devices

Smoke alarms operated. There was no automatic suppression equipment present.

Fire Origin and Path

The fire, of undetermined cause, broke out in the living room of a first-story apartment and spread up to the second floor when someone from the unit of origin left the door open. The fire entered the open stairwell, trapping the upper-floor occupants.

Contributing Factors and Victim Locations

Six of the occupants died, and 12 were injured and taken to medical facilities. Those who survived were either helped out by first responders or escaped on their own, several by jumping. The fatalities were all located in two second-floor apartments where they were trapped by the spreading fire in the stairwell. One firefighter was injured.

Ohio

Date, Time of Alarm, Number of Deaths

June, 4:44 a.m., 6

Number of Stories, Occupancy Type, Construction Type

This was a two-story, single-family home of unprotected wood-frame construction that covered 1,080 square feet (100 square meters). The home was occupied by six people at the time of the fire.

Smoke Alarm and Other Protection Devices

There were no smoke alarms or suppression equipment present.

Fire Origin and Path

The fire was started by a charcoal grill left unattended on a rear wooden porch. The fire spread vertically along vinyl siding into the eaves and into the second floor bedrooms.

Contributing Factors and Victim Locations

When the fire department arrived, the fire was venting through the roof. Firefighters forced entry and tried to control the fire. Two adults were found on the first floor, one in the living-room and one in the bedroom, and four children were found in a second-floor bedroom. Two firefighters were injured.

New York

Date, Time of Alarm, Number of Deaths

July, 12:30 p.m., 6 (1 under age 6)

Number of Stories, Occupancy Type, Construction Type

This was a two-story, single-family home of unprotected wood-frame construction. The ground floor area was not reported.

Smoke Alarm and Other Protection Devices

There were no smoke alarms or suppression equipment.

Fire Origin and Path

Heat from a hot water tank ignited propane that had leaked into the basement, causing an explosion. The source of the propane leak was not reported.

Contributing Factors and Victim Locations

The explosion leveled the house. No information was reported as to whether the victims were residents of the house that exploded.

Washington

Date, Time of Alarm, Number of Deaths

January, 2:30 a.m., 5 (2 under age 6)

Number of Stories, Occupancy Type, Construction Type

This was a three-story, nine-unit apartment building of unprotected wood-frame construction that covered 15,000 square feet (1,394 square meters).

Smoke Alarm and Other Protection Devices

There were smoke alarms throughout the building and a single-station smoke alarm in the apartment of origin. It was not determined whether the alarm in the unit of origin was sounding, but those in the rest of the building were. There was no suppression equipment.

Fire Origin and Path

The fire began in a common wall space separating bathrooms on the first floor. No information was reported on the fire spread. The cause was undetermined.

Contributing Factors and Victim Locations

No information was reported.

Texas

Date, Time of Alarm, Number of Deaths

January, 1:30 a.m., 5

Number of Stories, Occupancy Type, Construction Type

This was a one-story, single-family home of unprotected wood-frame construction that covered 1,300 square feet (121 square meters).

Smoke Alarm and Other Protection Devices

There were no smoke alarms or automatic suppression equipment.

Fire Origin and Path

A fire of undetermined cause broke out in the living room and spread into several rooms.

Contributing Factors and Victim Locations

Hoarding behavior contributed to the fire spread and hindered the victims' escape and the firefighting operations. The house was extremely cluttered, and the back door in the kitchen was blocked by a refrigerator. The back door in the laundry room, which connected to the kitchen, was only accessible by a small path in the room. Clothing and other items were stacked halfway to the ceiling in the front bedroom, where a small area of the bed had been cleared to sleep on.

Investigators had to walk on top of the belongings to get to the breaker box. Both the middle and back bedrooms were also cluttered. See "Hoarding: The Fire and Life Safety Dangers of Too Much Stuff," *NFPA Journal*, January/February 2012, page 44, for more information on hoarding or visit

[NFPA News and Publications](#)

Pennsylvania

Date, Time of Alarm, Number of Deaths

February, 10:50 p.m., 5 (1 under age 6)

Number of Stories, Occupancy Type, Construction Type

This was a two-story, single-family home of unprotected ordinary construction. The floor area was not reported.

Smoke Alarm and Other Protection Devices

There were no smoke alarms or automatic suppression equipment.

Fire Origin and Path

This explosion and fire occurred when natural gas leaked into the basement. The ignition source was undetermined. No information was reported on the source of the gas leak.

Contributing Factors and Victim Locations

This home was one in a block of two- and three-story row houses. Arriving firefighters evacuated nearby houses and buildings and began fire suppression operations. While fighting the fire, they found a second natural gas fed fire. No information was reported as to the victims' locations. One firefighter was injured.

Pennsylvania

Date, Time of Alarm, Number of Deaths

March, 6:46 a.m., 5

Number of Stories, Occupancy Type, Construction Type

This was a two-story, two-family dwelling of wood-frame construction with brick veneer walls that covered 1,250 square feet (116 square meters). Both levels of the house were occupied at the time.

Smoke Alarm and Other Protection Devices

There were smoke alarms, but they did not operate because their batteries were missing. There was no automatic suppression equipment.

Fire Origin and Path

The fire broke out in the living room on the second floor when one of the occupants fell asleep while smoking and the cigarette ignited a seat cushion. The occupant tried to extinguish the fire before calling the fire department. It was not reported if he was one of the victims.

Contributing Factors and Victim Locations

All five victims were found on the second story, one in the hallway near the stairway, two in one bedroom, and two in two other bedrooms.

Mississippi

Date, Time of Alarm, Number of Deaths

August, 12:48 a.m., 5 (3 under age 6)

Number of Stories, Occupancy Type, Construction Type

This was a two-story, eight-unit apartment building of unprotected wood-frame construction that covered 3,807 square feet (354 square meters).

Smoke Alarm and Other Protection Devices

There were no smoke alarms in the apartment of origin, although other apartments had them. There was no automatic suppression equipment, but each apartment did have a manual CO2 extinguisher. It was not reported that any were used.

Fire Origin and Path

This fire broke out in the kitchen of a second-floor apartment. No additional information was reported on the cause or the spread of the fire.

Contributing Factors and Victim Locations

All the victims were found in the second-floor apartment. An adult was found in the hallway, partially in a bedroom, and two children were located in a bedroom, one in the closet. The locations of the other two victims, both children, were not reported.

Connecticut

Date, Time of Alarm, Number of Deaths

December, 4:52 a.m., 5

Number of Stories, Occupancy Type, Construction Type

This was a three-story, single-family home of unprotected wood-frame construction with a ground floor area of 2,600 square feet (242 square meters). It was in the process of being renovated.

Smoke Alarm and Other Protection Devices

Investigators could not determine whether smoke alarms were present. There was no automatic suppression equipment.

Fire Origin and Path

The fire began when hot embers were discarded on paper products, which they ignited. The area where the ashes were placed was not reported.

Contributing Factors and Victim Locations

No information was released due to ongoing litigation.

Table 2. Non-Home Structure Fires

Minnesota

Date, Time of Alarm, Number of Deaths

July, 1:44 a.m., 6 (1 under age 6)

Number of Stories, Occupancy Type, Construction Type, Operating Status

This three-story bed and breakfast, which covered 2,400 square feet (223 square meters), was of unprotected wood-frame construction. The number of occupants was not reported.

Detection Systems and Suppression Systems

Smoke alarms of an undetermined type operated, alerting the occupants. There was no explanation of the victims' failure to escape. There was no automatic suppression equipment.

Fire Origin and Path

The fire was started by an unattended candle on the first floor. No other information on the fire development was reported.

Contributing Factors and Victim Locations

The victims were found in various locations. One, who had come down from the third floor, was found on the first floor near the entrance to the kitchen. The other five victims were found on the second floor. Two were in the hallway, one was in a bedroom, one was found in debris from a third-floor collapse, and one was found in an unspecified location on the second floor.

Kansas

Date, Time of Alarm, Number of Deaths

October, 7 p.m., 6

Number of Stories, Occupancy Type, Construction Type, Operating Status

This 12-story grain elevator, which covered 5,000 square feet (465 square meters), was of protected noncombustible construction. It was in operation at the time of the explosion.

Detection Systems and Suppression Systems

Neither smoke detection nor automatic suppression equipment was present.

Fire Origin and Path

A grain dust explosion occurred on the sixth floor. Its cause was undetermined.

Contributing Factors and Victim Locations

Three of the victims were found outside the structure, one on the ground near railroad tracks, one in a partially loaded grain car, and one on a catwalk 15 feet (5 meters) above the ground. Three were found inside the grain elevator, two in an inspector's office and one in a scale office. Two other workers were severely injured. Emergency response was complicated due to congestion of onlooker vehicles near the scene. No information was reported on the cause of death.

Hawaii

Date, Time of Alarm, Number of Deaths

April, 9 a.m., 5

Number of Stories, Occupancy Type, Construction Type, Operating Status

This was an underground World War II-era munitions bunker used to store fireworks. The bunker was 250 feet (76 meters) long, 15 feet (5 meters) wide, and 20 feet (6 meters) high. At the time of the explosion, six employees were disposing of seized fireworks, four inside the bunker and two outside.

Detection Systems and Suppression Systems

There was no detection or suppression equipment.

Fire Origin and Path

The cause and origin is undetermined .

Contributing Factors and Victim Locations

All four workers inside the structure were killed, as was one of the two working outside. No information was reported on the cause of death.

California

Date, Time of Alarm, Number of Deaths

May, 11:49 p.m. 5

Number of Stories, Occupancy Type, Construction Type, Operating Status

This was a one-story, residential board-and-care facility for adults with mobility and cognitive impairments that covered 3,000 square feet (279 square meters). It was of unprotected wood-frame construction.

Detection Systems and Suppression Systems

The activation of the battery-operated smoke alarms was not determined. There was no automatic suppression equipment.

Fire Origin and Path

The fire broke out in a bedroom, and heavy smoke and flames were showing when firefighters arrived.

Contributing Factors and Victim Locations

Six people were reported trapped in the structure when firefighters arrived. All five victims were found in bedrooms. Three other occupants, including two staff members, were injured.

Texas

Date, Time of Alarm, Number of Deaths

February, 1:29 p.m., 4 (all under age 6)

Number of Stories, Occupancy Type, Construction Type, Operating Status

This was a 1 ½-story, single-family house used as a day care center. The structure was of unprotected wood-frame construction and covered 2,583 square feet (240 square meters). It was operating at the time of the fire, with seven babies and toddlers 17 months to three years old.

Detection Systems and Suppression Systems

There were two smoke alarms present. One battery operated device was missing its battery, and no firefighters heard the other device sounding. There was no automatic suppression equipment.

Fire Origin and Path

This fire started in the kitchen when a frying pan with cooking oil was left unattended on an operating electric stove. The pan overheated, and the cooking oil caught fire. Flames spread throughout the kitchen.

Contributing Factors and Victim Locations

The operator of the day care center was arrested and charged with leaving the children unattended. The trial is set for later this year. Three other children were injured.

Tennessee

Date, Time of Alarm, Number of Deaths

May, 6:38 a.m., 3

Number of Stories, Occupancy Type, Construction Type, Operating Status

This four-story atomized steel and iron powder manufacturing plant covered 261,600 square feet (24,303 square meters) and was of unprotected noncombustible construction.

The plant was operating at the time of the fire.

Detection Systems and Suppression Systems

Smoke alarms were present and operated. The coverage was not reported, but they were in the area of the explosion. There was no automatic suppression equipment.

Fire Origin and Path

At about 6:30 a.m., workers heard a hissing sound near a furnace and determined it was a gas leak in a trench. As they used a forklift to remove the trench cover, a friction spark ignited the leaking hydrogen gas. The resulting explosion shook large quantities of iron dust from the rafters and other surfaces in the upper portion of the building, and some of this dust ignited, causing multiple flash fires.

Contributing Factors and Victim Locations

The victims were in the area of the explosions and died of burns. This explosion and fire was the third at this plant within five months; together, they killed five workers and injured three others.

Table 3. Non-Structural Fires

New Mexico

Date, Time of Alarm, Number of Deaths

April, 4, 9:34 a.m., 4

Setting

A small private aircraft crashed and caught fire during takeoff. On board were the pilot and three passengers.

Climate

No information was reported.

Fire Origin and Path

During takeoff, the airplane slid along the runway, spewing sparks and smoke from the bottom of the wing before becoming fully engulfed in fire. The plane then struck several obstructions and came to rest upright. (See the National Transportation (Safety Board Preliminary report, found at http://www.nts.gov/aviationquery/brief.aspx?ev_id=20110403X03645&key=1.)

Factors Hindering Occupant Escape

No information was reported.

North Carolina

Date, Time of Alarm, Number of Deaths

May, 4:15 p.m., 4

Setting

The pilot of a small private aircraft reported a fire onboard before the plane crashed. There were three passengers on the aircraft.

Climate

No information was reported.

Fire Origin and Path

During a flight, the pilot reported to air traffic controllers that there was a fire on board and declared an emergency. He did not give specific details on the fire. Shortly afterward, the plane crashed and burned. (See the NTSB preliminary report, found at http://www.nts.gov/aviationquery/brief.aspx?ev_id=20110525X85612&key=1.)

Factors Hindering Occupant Escape

No information was reported.

Idaho

Date, Time of Alarm, Number of Deaths

August, 2:33 p.m., 4

Setting

A small private aircraft crashed and caught fire shortly after takeoff. There was a pilot and three passengers aboard.

Climate

No information was reported.

Fire Origin and Path

The aircraft lifted off, descended and hit an asphalt roadway, then it skipped back into the air and came to rest on a railroad right-of-way approximately 100 feet (30 meters) from an intersecting

roadway. It became fully engulfed, and the fire spread to a hay field. (See the NTSB Preliminary report, found at http://www.nts.gov/aviationquery/brief.aspx?ev_id=20110815X10520&key=1.)

Factors Hindering Occupant Escape

No information was reported.

Nebraska

Date, Time of Alarm, Number of Deaths

April, no time reported, 3

Setting

This was a prescribed burn by permitted civilians involving grassland on private property.

Climate

No information was reported.

Fire Origin and Path

A wind change caused the fire to go out of control.

Factors Hindering Occupant Escape

No information was reported.

Wyoming

Date, Time of Alarm, Number of Deaths

August, 10 a.m., 3

Setting

This was a pipeline in a trench near an oil storage tank at an oil well.

Climate

No information was reported.

Fire Origin and Path

This explosion and fire involved piping in a trench near an oil storage tank. Two people were working on the pipe in the trench, and a third worker was nearby, when natural gas somehow ignited. Oil in a nearby tank also ignited, causing the tank to explode. No information was reported on how the tank became involved in fire.

Factors Hindering Occupant Escape

The fire filled the trench, trapping the workers, at least one of whom was killed by the explosion. The cause of the other two workers' deaths was not reported. Due to ongoing litigation, no other information is available.