LARGE-LOSS FIRES IN THE UNITED STATES-2009

Stephen G. Badger
Fire Analysis and Research Division
National Fire Protection Association

November 2010

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471
www.nfpa.org

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Introduction

Each year, the NFPA reports on large-loss fires and explosions that occurred in the United States the year before. Such fires and explosions are defined as any event that results in property damage of at least $10 million. In 2009, according to Michael J. Karter Jr., in "U.S. Fire Loss For 2009," in the September/October issue of *NFPA Journal*, U.S. fire departments responded to an estimated 1,348,500 fires—480,500 structure fires and 868,000 non-structure fires—which caused an estimated loss of $12.5 billion. Many of these fires were small or resulted in little or no reported property damage. However, 24 of them resulted in losses of $10 million or more each, for a total of roughly $940 million in direct property losses. Although these fires accounted for only 0.002 percent of the estimated number of fires in 2009, they accounted for 7.5 percent of the total estimated dollar loss.

NFPA tracks and tries to verify loss information for all large-loss fires reported in the media or by other sources. These 24 large-loss fires are those fires for which an official dollar loss was obtained.

The number of large-loss fires annually has ranged over the past 10 years from 16 to 45, with an average of approximately 25 fires per year. When adjusted for inflation to 2000 dollars, the number of fires in 2009 that could be categorized as large-loss fires—that is, fires resulting in a loss of $10 million in 2000 dollars—drops to 17, with an adjusted loss of $693 million in 2000 dollars (Figures 1 and 2).

In 2009, 14 fires resulted in more than $20 million each in property damage. These costliest 14 fires, which include 10 structure fires, 3 wildland fires, and 1 vehicle fire, resulted in a combined property loss of $813.2 million, which represents 86.5 percent of the total loss in large-loss fires and 6.5 percent of the total fire losses of 2009. Two fires alone resulted in losses of over $100 million each. The combined loss for these fires was $440 million.

The largest of the large

The largest-loss fire in 2009 occurred in the pavilion of a riverboat casino that was being renovated and caused an estimated $340 million in damage. The one- and two-story facility covered 118,000 square feet (11,000 square meters) and was of protected noncombustible construction. The one-story pavilion, which housed shops, restaurants, and a large ballroom, was connected by an above-ground walkway to a two-story casino that sits on two barges in the river. The fire destroyed the pavilion, but the casino was untouched.

While welding new duct work into an older duct work system in the kitchen, a welder saw smoke coming from an area where he had just been working. He went to get a fire extinguisher, but it was no longer where he had seen it earlier. Meanwhile, the surveillance department discovered the fire and sent someone to investigate; the method of discovery was not reported. The investigator confirmed the fire, having seen a hole burned through the duct work in the ceiling, and the premises was ordered evacuated. At the same time, the fire alarm sounded.

The fire spread to the ballroom, then to the hallway and throughout the structure. Arriving firefighters found that the fire had spread through the roof of the new construction area of the pavilion and started an interior attack. They also made trench cuts in the roof in an effort to stop the fire's spread. As conditions deteriorated, however, the incident commander ordered the firefighters inside and on the roof to evacuate, and a defensive attack was begun with master stream appliances.

During the fire, water availability became a problem; no cause was reported. Thirty extra tankers were requested from nearby communities to start a tanker shuttle of water to the scene. It was not reported if the river was used as a water supply.

Where fires occurred

Nineteen of the 24 large-loss fires of 2009 occurred in structures, resulting in a total property loss of $716.8 million. Another three were wildland fires that resulted in a total property loss of $169 million, and two more were vehicle fires that resulted in a total loss of $54.5 million. The vehicles involved were a tractor-trailer truck with TV broadcasting equipment and a cargo plane.

Six of the structure fires occurred in buildings that were under construction or being renovated, with a total loss of $429.8 million. The structures included three apartment buildings under construction. The buildings being renovated the casino pavilion mentioned above, a middle school, and a block of stores. Four fires occurred in manufacturing properties—a meat preparation plant, a machinery parts manufacturer, a truss and beam lamination plant, and a saw mill—and resulted in a total loss of just over $102.5 million. Three fires occurred in storage properties—a produce warehouse, a chemical waste facility, and a book storage warehouse—and resulted in losses of $70 million.

Two more structure fires each involved residential properties, both single-family homes, and two basic industry facilities, an 11-barn egg farm and a transformer next to an electric power generating plant, for a total loss of $40 million and $32 million, respectively. There was one fire each in a college classroom building and a furniture store, resulting in losses of $22.5 million and $20 million, respectively.

Information on operating status was reported for 17 of the 19 structure fires. Six were at full operation or occupancy, and three had some construction workers at the site. Eight properties were closed when the fires broke out.

Information on the cause of the fire was reported for 10 of the structures, all 3 wildfires, and 1 vehicle fire. Two of the structure fires and one wildland fire were incendiary. The resulting losses in these fires were $83 million, or 8.8 percent of the fire loss in large-loss fires.

Seven of the fires, five in structures and both the vehicles fires, broke out between 11 p.m. and 7 a.m.

Detection and suppression systems

Information about smoke detection equipment was reported for 16 of the 19 structure fires. Eleven of the 16 fires, or 69 percent, occurred in properties that had no automatic detection equipment. The other five structures had some type of automatic detection equipment. One had complete coverage smoke and manual alarms, and the coverage of the other four systems, which included three smoke detection systems and one unreported type of system, was not reported. Four of the five systems operated effectively, while the operation or effectiveness of the other system was not reported.

Information on automatic suppression equipment was reported for 18 of the 19 structure fires. Eleven structures had no suppression equipment, and seven had some type of system. Three had wet-pipe sprinklers; two provided partial coverage and the coverage of the other was not reported. Two had dry-pipe systems, both with unreported coverage. And two others were reported simply as suppression systems. One was still under construction, and the coverage of the other was not reported.

Three of the seven systems operated, and four did not. One of the systems that operated effectively controlled the fire, but two did not, one because the fire broke out above the covered area and the other because the water available was insufficient. Of the four systems that did not operate, one was not yet operational, the backflow device of another was turned off, and no reason was given for the final two.

Complete information on both detection and suppression equipment was reported for 15 of the 19 large-loss structure fires. In three structures, only detection equipment was present. In three more, only suppression equipment was present. In one fire, the structure had both detection and suppression systems, and eight properties, or 53 percent of all structures for which information was reported, had no coverage.

What we can learn

This study reports on the small share of fires that account for major losses. The number of fires in 2009 that resulted of losses of at least $10 million decreased by almost 31 percent from the total in 2008, and the associated property losses decreased by more than $1.4 billion. That difference in dollar loss can be accounted for by a large decrease in manufacturing property fires and wildfire losses. In 8 of the past 10 years, at least one fire has resulted in a loss of more than $100 million, and in at least four years, there was one loss of more than $1 billion. In 2009, two fires did more than $100 million in damage.

Adherence to the fire protection principles reflected in NFPA's codes and standards is essential if we are to reduce the occurrence of large-loss fires and explosions in the United States. Proper design, maintenance, and operation of fire protection systems and features can keep a fire from becoming a large-loss fire. Proper construction, storage, and housekeeping will make fires less likely and help control or limit the fire spread should a fire occur.

Where we get our data

NFPA identifies potential large-loss incidents by reviewing national and local news media, including fire service publications. A clipping service reads all U.S. daily newspapers and notifies the NFPA's Fire Analysis and Research Division of major large-loss fires. NFPA's annual survey of the U.S. fire experience is an additional data source, although not the principal one.

Once an incident has been identified, we request information about the fire from the fire department or agency having jurisdiction. We also contact federal agencies that have participated in investigations, state fire marshal's offices, and military sources. The diversity and redundancy of these data sources enable the NFPA to collect the most complete data available on large-loss fires.

About the author

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

Table 1
Large-Loss Fires that Caused $10 Million or More in Property Damage, 2000-2009

Year	Number of Fires	Number of Fires Causing $10 Million or More in 2000 Dollars	Direct Property Damage (in Millions) As Reported	Direct Property Damage (in Millions) In 2000 Dollars
2000	31	31	$1,814	$1,814
2001*	19	15	$762	$702
2002	25	22	$562	$509
2003	21	17	$2,623	$2,417
2004	16	9	$337	$242
2005	16	6	$217	$101
2006	16	13	$380	$305
2007	45	33	$3,393	$2,709
2008	35	23	$2,372	$1,794
2009	24	17	$940	$693

* Excluding the 9/11/01 World Trade center Incident from the loss totals but not the fire incident totals.

Note: Number of fires and unadjusted loss are based on data from studies that appeared in previous annual large-loss studies. Some of the information may differ from previously published material because material was updated after publication.

Note: Adjustment for inflation is based on the Consumer Price Index using 2000 as a base year. Note that adjustment for inflation not only reduces the the total dollar loss for each year but also reduces the number of fires when adjusted losses large enough to qualify as large-loss fires.

Source: NFPA's Fire Incident Data Organization (FIDO)

Table 2
Large-Loss Fires of $20 Million or More in 2009

Incident and Location	Loss in Millions
Casino pavilion under renovation, Illinois	$340.0
Wildfire, California	$100.0
Meat preparation plant, Minnesota	$50.0
TV broadcasting vehicle, Texas	$44.0
Wildfire, South Carolina	$44.0
Apartment building under construction, Indiana	$38.0
Produce warehouse, North Carolina	$30.0
Chemical waste recycling storage, Ohio	$29.7
Machinery parts manufacturing, Arkansas	$25.0
Single-family home, Michigan	$25.0
Wildfire, California	$25.0
College classrooms, Ohio	$22.5
Furniture store, Texas	$20.0
Egg farm barns, Texas	$20.0
Total Fires: 14	$813.2

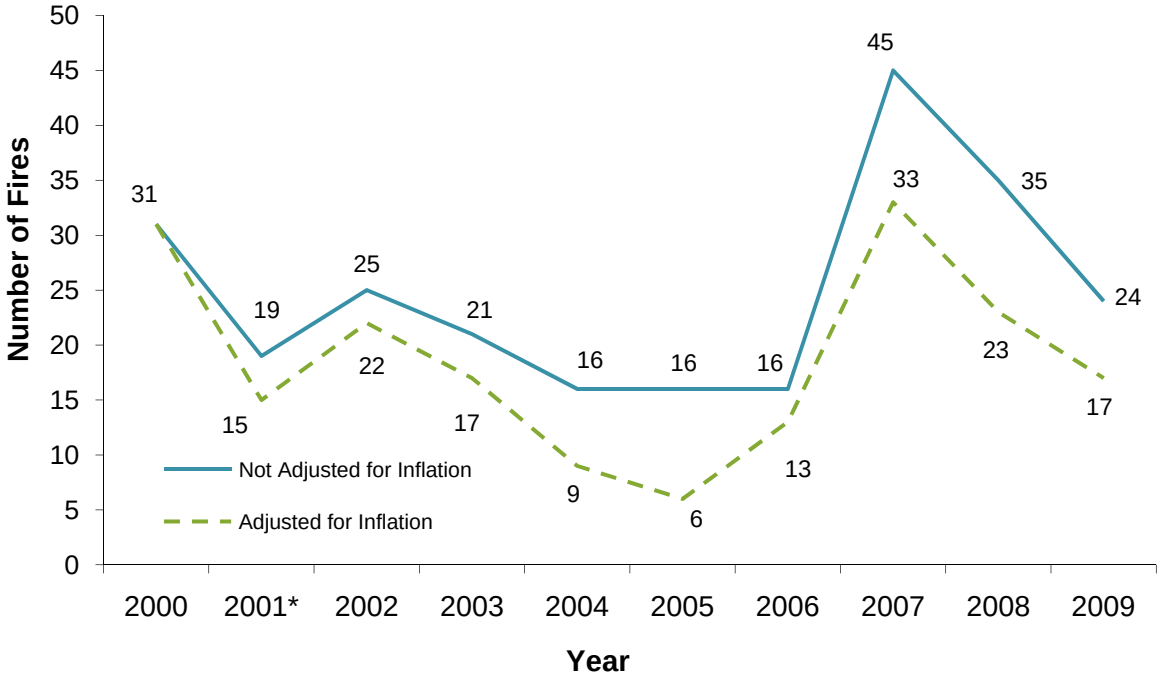
Source: NFPA's Fire Incident Data Organization (FIDO).

Table 3
2009 Large-Loss Fires by Major Property Use Classification

Property Use	Number of Fires	Percent of Fires	Total Dollar Loss	Percent of Loss
Special Properties	6	25%	$429,784,856	45.7%
Manufacturing	4	17%	$102,500,000	10.9%
Wildlands	3	13%	$169,000,000	18.0%
Storage	3	13%	$69,980,000	7.4%
Vehicle	2	8%	$54,500,000	5.8%
Residential	2	8%	$40,000,000	4.3%
Basic Industry	2	8%	$32,000,000	3.4%
Educational	1	4%	$22,500,000	2.4%
Stores and Offices	1	4%	$20,000,000	2.1%
Total	24	100%	$940,264,856	100.0%

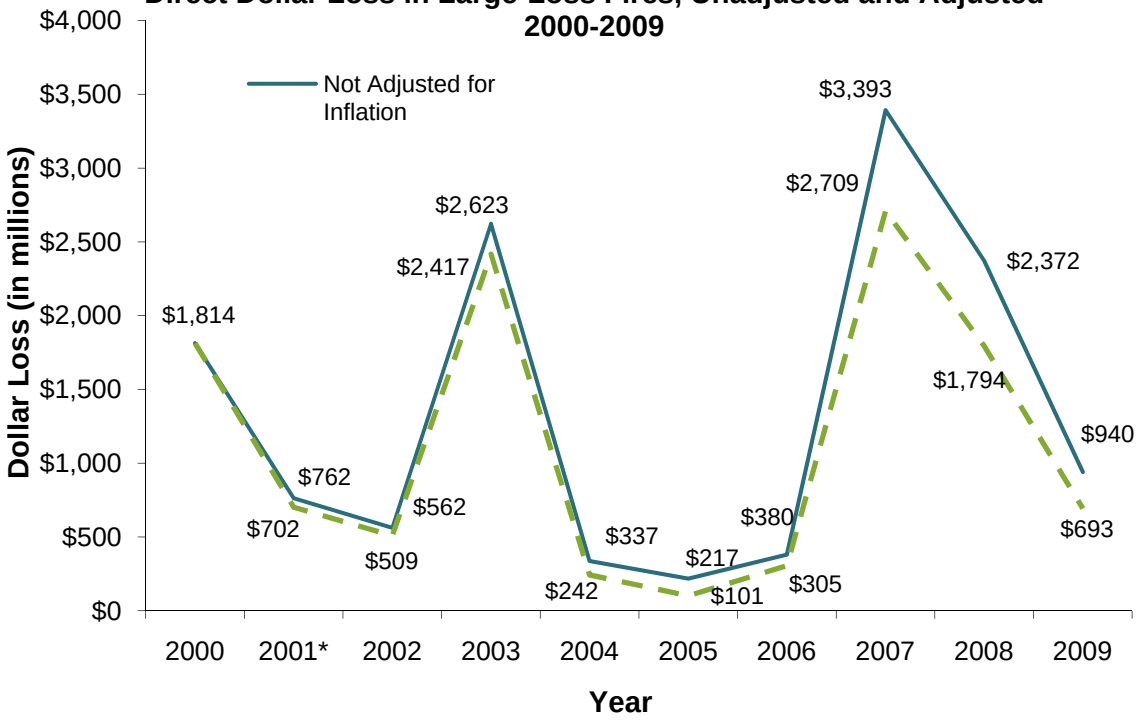
Source: NFPA's Fire Incident Data Organization (FIDO).

Figure 1
Large-Loss Fires, Unadjusted and Adjusted for Inflation, 2000 - 2009



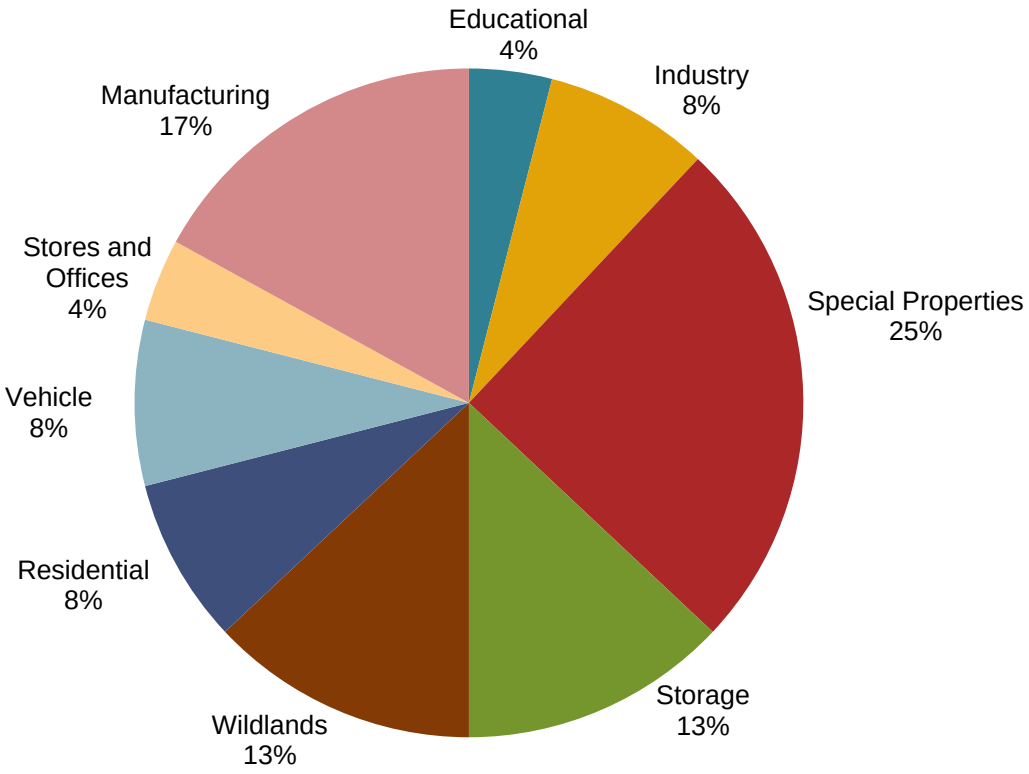
Note: The 2001 totals include the 9/11/01 World Trade Center Incident

Figure 2
Direct Dollar Loss in Large-Loss Fires, Unadjusted and Adjusted 2000-2009



Note:Losses exclude the 9/11/01 World Trade Center Incident

Figure 3
2009 Large-Loss Fires by Major Property Use



2009 Large-Loss Fire Incidents

Special Properties

Illinois
$340 million
March, 9:33 a.m.

Property Characteristics and Operating Status
This was a one- and two-story casino pavilion that covered 118,000 square feet (10,963 square meters) and was of protected noncombustible construction. An elevated walkway separated the pavilion from a two-story casino. The pavilion contained shops, restaurants, and a ballroom. At the time of the fire, the structure was undergoing major renovations, and construction workers were on site.

Fire Protection Systems
The fire alarms present operated and notified the workers, who evacuated safely. No information was reported as to the presence or absence of automatic suppression equipment.

Fire Development
A welder was adding new ductwork to existing grease ducts in the kitchen when he spotted smoke and fire. He tried to get an extinguisher but could not find it. Grease and wood structural members ignited, and the fire spread to a large ballroom, then into the hallway and throughout the building.

Contributing Factors and Other Details
The pavilion was a total loss, but the casino was untouched by the fire due to the work of the firefighters at the elevated walkway separating the two structures. The structure sustained a loss of $290 million, and its contents sustained damages of $50 million.

Indiana
$38 million
March, 3:20 a.m.

Property Characteristics and Operating Status
This six-story apartment building was under construction at the time of the fire. The building covered 345,000 square feet (32,052 square meters) and was of unprotected wood-frame construction. Construction was nearly complete. No one was on site at the time of the fire.

Fire Protection Systems
Neither automatic detection nor suppression equipment was present.

Fire Development
This incendiary fire was set on the ground level in the rear of the building. No further information was reported.

Contributing Factors and Other Details
Firefighters were dispatched to calls for smoke in the area. Upon arrival, they found heavy smoke and fire in the building. They mounted an interior attack until conditions deteriorated and they were withdrawn. At the same time, exposure protection successfully kept the fire from spreading to two adjacent structures.

Washington
$19.8 million
November, 1:06 a.m.

Property Characteristics and Operating Status
This two-story middle school of unprotected ordinary construction covered 28,000 square feet (2,601 square meters). The building was being renovated at the time. No one was on site when the fire broke out.

Fire Protection Systems
Smoke detection equipment was present throughout the school, and there were manual pull stations at the exits. The smoke alarms were not located in the area of the fire, but they activated. There was a partial-coverage wet-pipe sprinkler system, but the fire broke out above the system so, although it activated, it was ineffective.

Fire Development
The fire, the cause of which was undetermined, broke out in the ceiling-attic assembly.

Contributing Factors and Other Details
Upon finding heavy fire and smoke issuing from the school, arriving firefighters began an interior attack. Due to fire growth and deteriorating conditions, however, they were withdrawn to an exterior attack. Structural damage was reported at $19,270,487; damage to its contents was reported to be more than $500,000.

Washington
$12 million
June, 8 p.m.

Property Characteristics and Operating Status
This five-story apartment building was under construction, covered 11,250 square feet (1,045 square meters), and was of unprotected wood-frame construction. No one was at the site at the time of the fire.

Fire Protection Systems
The automatic detection system had not yet been installed. Although a sprinkler system had been installed up to the second story, it was not yet operational.

Fire Development
Roofers had been using a torch during the day. Several spot fires had occurred, but they were thought to have been extinguished. However, overlooked embers had fallen into the void between the insulation, ceiling, and roof assembly, and a breeze provided enough air for a fire to flare up nearly four hours later. The fire spread rapidly through the wooden construction.

Contributing Factors and Other Details
Sheetrock had not yet been installed to protect the wood framing, and the fire spread rapidly, completely destroying the building.

Montana
$10 million
March, 8:30 a.m.

Property Characteristics and Operating Status
This two-story block of stores was being renovated in a downtown area. The store in which the fire started was 140 feet (43 meters) by 25 feet (8 meters) and was of unprotected wood-frame construction. Construction workers were on site when the fire broke out.

Fire Protection Systems
Neither automatic detection nor suppression equipment was present.

Fire Development
This fire broke out when embers from hot work fell into a basement partition wall and ignited paper or plastic. The fire then ignited wood framing and joists, and spread to the first and second stories through the balloon construction.

Contributing Factors and Other Details
Hot work was done without a fire watch, and there were no portable extinguishers at the location. Firefighters were able to make an interior attack before conditions deteriorated and crews were withdrawn. Winds blowing at 35 miles (56 kilometers) per hour and gusting up to 50 miles (81 kilometers) per hour hindered firefighting operations.

Oklahoma
$10 million
October, 6:01 p.m.

Property Characteristics and Operating Status
This four-story, 148-unit apartment building was under construction. The building covered 179,000 square feet (16,630 square meters) and was of unprotected wood-frame construction. Construction workers were at the site when the fire broke out.

Fire Protection Systems
No information was reported as to the presence or absence of smoke alarms. A wet-pipe

sprinkler system was present, but its coverage was not reported. The system failed to operate, but the reason for this was not reported.

Fire Development
The only information reported was that the fire broke out in a storage room on the first floor.

Contributing Factors and Other Details
None reported.

Manufacturing Properties

Minnesota
$50 million
April, 10:22 a.m.

Property Characteristics and Operating Status
This two-story meat preparation plant covered 300,000 square feet (27,871 square meters) and was of unprotected ordinary construction. The plant was in full operation at the time of the fire.

Fire Protection Systems
There was no detection equipment or suppression equipment present.

Fire Development
The fire began in the ceiling near the exhaust chimney of a cooker and burned undetected for a while.

Contributing Factors and Other Details
Firefighters had trouble reaching the fire because of barriers and obstructions created by multiple ceilings and extensive piping between the ceilings. Firefighters were concerned about a potential release of anhydrous ammonia. The fire destroyed more than a million pounds (453,592 kilograms) of food.

Arkansas
$25 million
July, 4:43 a.m.

Property Characteristics and Operating Status
This one-story machinery parts manufacturing plant covered 250,000 square feet (23,226 square meters). Its type of construction was not reported. No one was at the site when the fire broke out.

Fire Protection Systems
Neither automatic detection nor suppression equipment was present.

Fire Development
Lightning struck a roof vent and started a fire in the storage area.

Contributing Factors and Other Details
A security guard in a nearby facility detected the fire nearly 3½ hours after the lightning strike and called the fire department to report smoke in the area. By the time firefighters arrived, the factory was heavily involved in flames. The delayed discovery, as well as the high-rack storage, made fighting the blaze difficult. Damage to the structure was estimated at $15 million, and damage to its contents was estimated at $10 million. The large monetary loss was due to a large number of machines and a warehouse full of finished product.

Washington
$15 million
May, 10:35 p.m.

Property Characteristics and Operating Status
This one-story wood truss and beam laminating plant was of unprotected noncombustible construction and covered 5,000 square feet (465 square meters). No one was in the plant at the time of the fire.

Fire Protection Systems
No smoke alarms or suppression equipment were present.

Fire Development
The cause and origin of the fire were undetermined.

Contributing Factors and Other Details
Damage to the building came to $5 million; damage to its contents came to $10 million.

California
$12.5 million
September, 10:34 a.m.

Property Characteristics and Operating Status
This two- and three-story saw mill was of unprotected, wood-frame construction, had metal-covered walls, and covered 19,500 square feet (1,812 square meters). The mill was operating at the time of the fire.

Fire Protection Systems
There were no smoke alarms. A dry-pipe sprinkler system of unreported coverage was present, and all the sprinklers activated, but no water flowed because a backflow device had been turned off.

Fire Development
The fire began when cutting torch operations ignited sawdust and wood chips.

Contributing Factors and Other Details
The rapid fire spread was attributed to the presence of sawdust, pitch, and a large quantity of wood throughout the structure. The fire also spread through the many vertical openings in the walls. Lack of water prevented the sprinkler system from controlling the fire. Air tankers made two fire retardant drops, followed by water drops from helicopters. The loss to the structure was estimated at $12 million and to the contents at $500,000.

Wildland

California
$100 million
May, 1:40 p.m.

Property Characteristics and Operating Status
This fire occurred in a wildland/urban interface area.

Weather Conditions
The temperature at the time was in the 80oF (20oC) range, and wind was from the west at 5 miles (8 kilometers) per hour.

Fire Development
The fire broke out when a metal cutting wheel on a brush trimmer hit a rock and the spark ignited fine fuels. The fire smoldered undetected by the equipment operator until a motorist on a nearby highway spotted it about an hour after ignition.

Contributing Factors and Other Details
The fire destroyed 82 homes and burned 8,733 acres (3,534 hectares). Thirty-two firefighters were injured fighting this fire. At one time, a fire shelter was deployed, but it was abandoned before it was used.

South Carolina
$44 million
April, 12:22 p.m.

Property Characteristics and Operating Status
This fire occurred in a wildland/urban interface area.

Weather Conditions
The temperature was 71°F (22°C), humidity was 25 percent, winds were from the west at 17 miles (27 kilometers) per hour with gusts to 30 miles (48 kilometers) per hour, and rainfall was below normal.

Fire Development
A property owner's debris fire burned out of control and started this 19,130-acre (7,742-hectare) wildfire.

Contributing Factors and Other Details
Gusty winds, dry conditions, and volatile vegetation of pine, palmetto, gall berry (shrub), wax myrtles, and other waxy plants contributed to the fast spread of this fire. Organic soils allowed the fire to burn under the fire lines, trees with no root systems to fall, and equipment to bog down in the many snags and holes. On the first night of the blaze, two firefighters operating tractors were forced to deploy their fire shelters when the wind shifted and their vehicles bogged down. They were uninjured. The fire destroyed 76 homes and damaged another 97, causing up to 4,000 people to evacuate their homes. Timber loss was estimated at $17 million, and structural and content loss in the city was estimated at $20.5 million. The rest was miscellaneous county, state, and forestry losses to fences, outbuildings, roads, and other infrastructure.

California
$25 million
August, 2:22 p.m.

Property Characteristics and Operating Status
This fire occurred in a wildland/urban interface area.

Weather Conditions
Temperature at the time was 90°F (32°C), and the wind was from the west at 15 miles (24 kilometers) per hour.

Fire Development
This was an incendiary fire. No further information was reported.

Contributing Factors and Other Details
The wind-driven fire destroyed 65 homes and 5 businesses, and burned 311 acres (126 hectares).

Storage Properties

North Carolina
$30 million
April, 9:40 p.m.

Time: Property Characteristics and Operating Status
This one-story produce warehouse, which contained crates of sweet potatoes, was of unprotected noncombustible construction and covered 40,000 square feet (3,716 square meters). The facility was closed for the weekend.

Fire Protection Systems
No information was reported as to the presence or absence of automatic detection equipment. There was a partial-coverage wet-pipe sprinkler system, which activated and kept the fire from spreading into the protected area of the building.

Fire Development
The cause of the fire was unknown and is under investigation. The fire began in an exterior shelter and spread into and throughout the nonprotected area of the warehouse. Upon arrival, firefighters found the warehouse well involved. An arriving pumper supplied the sprinkler system in the protected area of the building through the fire department connection, while firefighters made a defensive attack against the involved section.

Contributing Factors and Other Details
Two firefighters were injured. The loss to the building was estimated at $15 million, and damage to the contents was estimated at $15 million.

Ohio
$29.7 million
May, 12:07 a.m.

Property Characteristics and Operating Status
This 20-acre (8-hectare) chemical waste facility comprised eight structures of various types and sizes. The explosion occurred in a one-story building that covered 7,500 square feet (697 square meters). The type of construction was not reported. At the time of the explosion, six workers were in different parts of the facility.

Fire Protection Systems
Smoke alarms were present in the building where ignition occurred, but their coverage was not reported, and it is not known if they operated. There was no automatic suppression equipment.

Fire Development
A flame in a natural gas burner in the lab/operations building in front of the tank farm ignited a vapor cloud from an overpressure leak in the tank farm, causing a large explosion and fire.

Contributing Factors and Other Details
The explosion heavily damaged all the structures in the facility, as were about 20 surrounding residences and 5 businesses. Four civilians were injured in the explosion, and a firefighter was injured fighting the fire.

Florida
$10.3 million
October, 6:51 p.m.

Property Characteristics and Operating Status
This single-story book storage building covered 19,500 square feet (1,812 square meters). No information about the operation of the building or the type of construction was reported.

Fire Protection Systems
Neither smoke alarms nor automatic suppression equipment was present.

Fire Development
No information was reported.

Contributing Factors and Other Details
Damage to the structure was estimated at $10 million, and damage to its contents was estimated at $300,000.

Vehicle

Texas
$44 million
April, 3:55 a.m.

Property Characteristics and Operating Status
A tractor-trailer containing electronic equipment for television sports broadcasting caught fire on an interstate highway. The operator was the only person in the truck.

Fire Development
No information was reported.

Contributing Factors and Other Details
No information was reported.

Texas
Date, Time of Alarm, Dollar Loss
January, 4:38 a.m., $10,500,000

Property Characteristics and Operating Status
This fire involved a twin-engine cargo plane landing at an airport.

Fire Development
The plane crashed short of the runway, struck the approach lighting system, and caught fire.

Contributing Factors and Other Details
Fire damage to the aircraft was estimated at $10 million, while damage to the cargo it was carrying was estimated at $500,000. For further information, read the NTSB accident report online.

Residential

Michigan
$25 million
July, 4:19 a.m.

Property Characteristics and Operating Status
This two- and three-story, single-family home of unprotected wood-frame construction covered 23,000 square feet (2,137 square meters). The house was occupied at the time of the fire.

Fire Protection Systems
Smoke alarms of unreported coverage operated to alert the occupants. There was no automatic suppression equipment.

Fire Development
The cause of this fire, which broke out in a lower-level recreation room, was undetermined. It traveled into a void between the floors and up the walls to the upper-level hallway.

Contributing Factors and Other Details
The occupant evacuated the structure. Firefighters were forced from an interior attack by a back draft on the upper level of the house. Damage to the structure was estimated at $15 million, and damage to the contents, which included artwork, was put at $10 million.

District of Columbia
$15 million
July, 8:15 p.m.

Property Characteristics and Operating Status
This three-story, single-family home of unprotected wood-frame construction covered 1,710 square feet (159 square meters). There was one person at home when the fire broke out.

Fire Protection Systems
Smoke alarms of unreported coverage were present and operated. No automatic suppression equipment was present.

Fire Development
The cause of this fire, which broke out on a balcony or porch, is under investigation.

Contributing Factors and Other Details
The fire was shielded from public view until it had engulfed a large portion of the porch and a neighbor spotted it. Another neighbor's attention was caught by the sounding alarms around the same time. Multiple roof, floor, and ceiling collapses forced firefighters to an exterior position. The water supply was an issue, although no further information was reported. Damage to the structure, which contained quite a bit of combustible artwork and decorative finishes, was estimated at $6 million. Damage to the contents, including the artwork, was estimated at $9 million. One firefighter was injured. The occupant evacuated the structure unharmed.

Basic Industry

Texas
$20 million
July, 5:36 p.m.

Property Characteristics and Operating Status
The fire started in a manure tunnel connecting one barn of this 11-barn egg farm to another that was 20 feet (6 meters) high, of unprotected wood-frame construction, and covered 45,000 square feet (4,181 square meters). This barn and four others were destroyed. No one was in the facility at the time of the fire.

Fire Protection Systems
Neither automatic detection nor suppression equipment was present.

Fire Development
The fire broke out in a manure tunnel where welding had been done earlier. Hot materials that had dropped into the manure and feathers on a conveyer belt flamed after the workers had left for the day, and the fire burned in the tunnel between the buildings before it spread to the barns.

Contributing Factors and Other Details
Firefighters from 12 departments arrived to find at least two barns totally engulfed in flames and tried to cool exposed structures using an irrigation well on an adjacent property as a water supply. Three firefighters were injured in the process.

Illinois
$12 million
September, 1:33 p.m.

Property Characteristics and Operating Status
This was a transformer next to a power plant. No additional information was reported.

Fire Protection Systems
There was no information available as to the presence or absence of detection equipment. A fire pump and an unreported type of suppression system failed to operate for an unreported reason.

Fire Development
A mechanical malfunction in the transformer led to the fire, which spread to the roof of the power plant.

Contributing Factors and Other Details
By the time local fire companies arrived, the plant fire brigade had extinguished the transformer fire using foam, and the brigade and the fire department together extinguished the fire on the roof. Water from a nearby lake had to be drafted and trucked to the scene, so additional tankers were called to assist. Early in the incident, live power lines overhead hampered firefighters' activities.

Educational Properties

Ohio
$22.5 million
February, 5:25 p.m.

Property Characteristics and Operating Status
This fire started in a tunnel containing wire and fiber optics that extended into a one-story college classroom building that covered 10,000 square feet (929 square meters). The building, which was of protected noncombustible construction, was closed at the time of the fire.

Fire Protection Systems
Neither smoke alarms nor automatic suppression equipment was present.

Fire Development
The cause of the fire was not reported.

Contributing Factors and Other Details
Fire and smoke damaged at least 10 other buildings on campus. Three firefighters were injured during extinguishment operations.

Stores and Offices

Texas
$20 million
May, 8:30 p.m.

Property Characteristics and Operating Status
This two-story furniture store of unprotected ordinary construction was open and operating at the time of the fire. The ground floor area was not reported.

Fire Protection Systems
The store had no automatic detection systems. A dry-pipe sprinkler system of unreported coverage operated, but the fire overwhelmed it, and it shut down within minutes of operating. No reason for this was given.

Fire Development
Someone started this incendiary fire by pouring gasoline in the warehouse and igniting it with an open flame. The fire quickly spread to several pallets containing 150 gallons (568 liters) of highly flammable fabric protector.

Contributing Factors and Other Details
The fabric protector, which was insoluble in water, and the fire loading in the warehouse allowed the blaze to accelerate. Damage to the structure was estimated at $5 million, and damage to its contents was estimated at $15 million. One firefighter was injured.