

LARGE-LOSS FIRES IN THE UNITED STATES-2007

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

November 2008



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

LARGE-LOSS FIRES IN THE UNITED STATES-2007

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

November 2008



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

Acknowledgements

NFPA thanks the U.S. fire service for its contributions of data, without which this report would not be possible. In many cases, the fire departments were unable to contribute complete details to the NFPA because legal action is pending or ongoing, or they are unable to determine many pieces of information we need to make our study as complete as possible. The author wishes to thank Rita Fahy and Norma Candeloro for providing the support this study requires.

For more information about the National Fire Protection Association, visit www.nfpa.org or call 617-770-3000. To learn more about the One-Stop Data Shop go to www.nfpa.org/osds or call 617-984-7443.

Copies of this analysis are available from:

National Fire Protection Association
One-Stop Data Shop
1 Batterymarch Park
Quincy, MA 02169-7471
www.nfpa.org
e-mail: osds@nfpa.org
phone: 617-984-7443

NFPA No. LLS07
Copyright © 2008, National Fire Protection Association, Quincy, MA

Introduction

In mid-October, Southern California was in a drought, with only five inches (12.7 centimeters) of rain since January. Santa Ana winds were forecast for a wide area. The winds, along with temperatures in the nineties F (low thirties C), created the scenario that led to one of the costliest fire seasons in recent memory. At approximately 9:42 pm on October 20th, the first fire erupted. Within a week, at least 23 named fires broke out. These fires would become known, collectively, as the Southern California Firestorm of 2007. The governor issued a state of emergency for several of the hardest-hit counties. The Fire Districts Association of California estimated that approximately a million people were evacuated or fled the approaching fires, heading to emergency shelters or to relatives and friends. Firefighters set up unified command systems at all the fires and directed operations. Several of the named fires burned together to form larger fires. Resources were strained for fire suppression crews.

Officials reported there were several different sources of ignition, including incendiary acts, power lines damaged by the Santa Ana winds, a vehicle crash, and a youngster playing with matches. Mother Nature played a large role in these fires as well: a deficit in rainfall, temperatures well over 90 degrees F (32 degrees C), relative humidity as low as 10 to 15 percent, and hurricane-strength Santa Ana winds, over 75 mph (121 kph) with gusts of over 100 mph (161 kph).

By the time the week ended, the fires had burned over 518,000 acres (210,000 hectares) and destroyed over 3,108 structures, including 2,180 residential properties. More than 500 other structures suffered damage and 239 vehicles were destroyed. It has been estimated that damage to agriculture in the area was over \$47 million.

At the time these major fires were burning, over 250 additional fires broke out. These fires were contained to less than 10 acres (4 hectares) each. More than 1,100 fire departments throughout California and across the United States, as well as several countries around the world, sent aid. Police departments, specially trained fire crews of prison inmates, and county and state officials also responded.

Loss estimates have varied, but the most reliable reported figure is \$1.8 billion in property damage. Tragically, the fires claimed at least 10 lives. Four additional deaths not involving fire effects occurred during evacuation.

NFPA reports each year on large-loss fires and explosions in the United States, defined as any event that results in property damage of at least \$5 million. In 2007, fire departments

responded to an estimated 1,557,500 fires that caused an estimated loss of \$14.6 billion.¹ Many of these fires were small or had little or no property damage reported; however, 71 fires resulted in losses of \$5 million or more each. Together these large-loss fires resulted in over \$3.5 billion in direct property loss, killed 19 civilians, and injured 168 firefighters and 67 civilians. These 71 fires accounted for only 0.005 percent of the estimated number of fires in 2007, but accounted for 24.1 percent of the total estimated dollar loss.

There were 25 more large-loss fires in 2007 than there were in 2006, an increase of over 54 percent in the number of large-loss fires. The total property loss in large-loss fires was up by almost \$3 billion, which meant that the 2007 total was more than six times the total in 2006. Most of this increase, and half the large-loss total for 2007, occurred in the Southern California Firestorm alone. In fact, large-loss wildland fires *excluding* the Southern California Firestorm accounted for more total loss than the large-loss total for all of 2006.

When adjusted for inflation to 1998 dollars, the number of large-loss fires in 2007 was the highest since 1999. Adjusted total loss in those fires was the highest since 2001, when the September 11 attacks on the World Trade Center occurred. (See Table 1, Figures 1 and 2).

The Southern California Firestorm of 2007 was one of 20 fires that caused more than \$20 million in property damage. (See Table 2). Of these 20 fires, 13 were structure fires, six were wildland fires and one was a vehicle fire. Together they resulted in a combined loss of \$3 billion, which represents 85.7 percent of the total large-loss fire losses, and 20.5 percent of the total fire losses in 2007. The Southern California Firestorm was also one of five fires in 2007 with a loss of over \$100 million. The combined losses for these fires was \$2.5 billion, or 61.4 percent of the large-loss losses and 17.1 percent of the total fire losses in 2007.

From 1998 to 2006, there was a generally downward trend in the number of large-loss fires and explosions, but the 2007 total was a sharp departure from that trend. Total loss in large-loss fires is too sensitive to the specific loss in the costliest incidents each year to show any clear trend.

Where fires occurred

In 2007, 71 large-loss fires occurred in all major property categories, except healthcare and correctional facilities. (See Table 3 and Figure 3). Fifty-nine of the 71 fires occurred in structures, causing a total loss of \$946.7 million. Ten wildland fires resulted in losses of \$2.4 billion. There were two vehicle fires, resulting in losses of \$107.5 million. One of these fires involved a gasoline tanker truck crash and fire that affected a series of roadway overpasses.

¹ Michael J. Karter Jr., "Fire Loss in the United States During 2007," *NFPA Journal*, September/October 2008.

Fifteen of the 59 structure fires occurred in special structures, including 10 buildings under construction, three vacant or idle properties, a pier, and a boardwalk. These fires resulted in \$211 million in losses.

Eleven fires occurred in manufacturing plants, resulting in losses of \$269.8 million.

Eight fires in residential structures resulted in losses of \$78.5 million. Of these eight fires, five occurred in apartment buildings, two in single-family homes, and one in a lodging or rooming house.

Six fires in stores and office properties resulted in losses of \$100.1 million. Five of these six fires were in stores and one occurred in an office building)

Five fires each occurred in industrial properties, educational properties (including two high schools, two elementary schools and a college building), and storage properties, resulting in losses of \$100.0 million, \$75.3 million, and \$71.5 million, respectively.

Four fires occurred in public assembly properties -- two churches, a library and a country club clubhouse -- resulting in losses of \$30.5 million.

Information on operating status was reported for 49 of the 59 structure fires. Twenty-seven were operating to some extent. Twenty-two were at full operation or occupancy, three had construction workers on site, one was partially operating, and one had security present. Twenty-two properties were closed or were not known to have anyone on site when the fire broke out.

The cause was reported for 33 of the structure fires, three of the wildland fires, and one of the vehicle fires. Ten of the structure fires were confirmed as incendiary and two others were suspected incendiary. The 10 incendiary fires were responsible for five of the 19 deaths; there were no deaths in the two suspicious fires.

Twenty-four of the fires broke out between 11:00 pm and 7:00 am. Twenty-one of these were in structures, one in wildlands, and two in vehicles. The cause was known in 12 of these fires, with five being confirmed incendiary. Of these five, four occurred in closed properties and one in a property that was operating.

Detection and suppression systems

Information about smoke detection equipment was reported for 41 of the 59 structure fires. Twenty-one of these 41 properties (51 percent) had some type of automatic detection equipment present. Twenty fires occurred in properties with no automatic detection equipment. Of the 21 properties that had equipment, five had complete coverage systems -- three with smoke detection and two with automatic detection of an unreported type. Two were partially covered with smoke detection systems. Five other structures had smoke

detection equipment, but the coverage of these systems was not reported. Eleven of the 21 systems operated effectively, while four systems failed to operate -- three were not operational yet and one had been shut down prior to the fire because the building was vacant. The operation or effectiveness of six of the system was not reported.

Information on automatic suppression equipment was reported for 48 of the 59 structure fires. Twenty-eight structures had no suppression equipment at all. For the 20 structures with systems, all were sprinkler systems. Of the 20, 10 were wet-pipe systems, two were dry-pipe systems, and two were combination wet and dry-pipe sprinkler systems. The other six were reported simply as sprinkler systems, with no type reported.

Five sprinkler systems were complete coverage. Of these, two were wet-pipe systems, two were combination systems, and one system type was not specified. Five systems had partial coverage. Of these, two were wet-pipe systems, one was a dry-pipe system and two were not specified. The coverage of 10 systems was not reported.

Ten of the 20 systems operated. Two of those 10 were partial-coverage systems that operated as designed, keeping the fire out of the protected area. Eight systems operated but were not effective -- one because sprinklers were not in the area of the fire, one due to poor maintenance, another due to poor head clearance, one due to a lack of enough agent available (no explanation was given), one because the main valve in the part of the system in the area of origin was padlocked shut, and three for unreported reasons. Eight systems did not operate. Four of these had been shut off prior to the fire for various reasons, three systems were being installed and not yet operable, and no reason was given in the eighth case.

Complete information on both detection and suppression equipment was reported for 39 of the 59 structure fires. Eleven had only detection equipment, seven had only suppression equipment, eight had both detection and suppression, and 13 properties (22 percent of all structures) had no coverage.

What we can learn

Each year's large-loss study focuses on the relatively small number of fires that account for a significant portion of the dollar loss that year. In the case of 2007, 71 fires accounted for approximately a quarter of the year's losses. Details on all 71 large-loss fires in 2007 can be found in Table 4.

As stated earlier, the number of large-loss fires increased by over 50 percent, and the property loss increased by over \$3 billion, over half of which was the result of one fire incident. In seven of the past 10 years, at least one fire has caused a loss of over \$100 million. In 2007, there were five such incidents, resulting in a total loss of \$2.5 billion. In the past 10 years, there have been eight wildland fires that each resulted in more than \$100 million in losses.

Adherence to the fire protection principles reflected in NFPA's codes and standards is essential if we are to succeed in reducing the occurrence of large-loss fires and explosions in the United States. A range of ignition causes and factors were reported among the large-loss fires in 2007, including incendiary, abandoned or discarded smoking materials, mechanical or part failures, short circuits, combustibles too close and unattended candle. Proper design, maintenance and operation of fire protection systems and features can keep a fire from becoming a large-loss fire. Proper construction, storage methods, and housecleaning will make fires less likely and help control or limit the fire spread, if fire occurs.

Financial and economic losses are one thing, but the emotional toll of losing your dreams and future hopes cannot be calculated in dollars. That is one thing all the fires in this report have in common.

Where we get our data

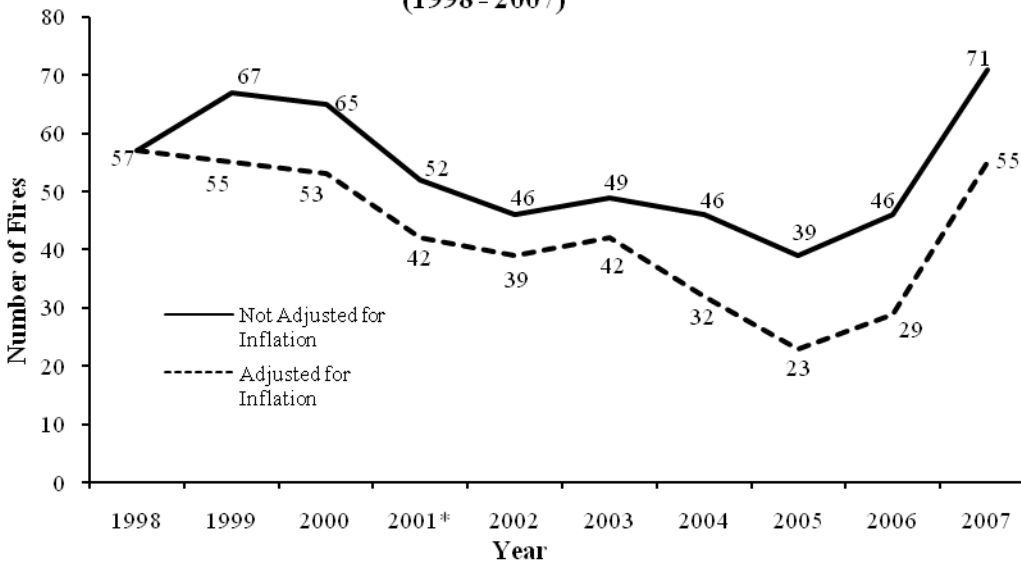
NFPA identifies potential large-loss fires and explosions by reviewing national and local news media, including fire service publications. A clipping service reads all U.S. daily newspapers and notifies NFPA's Fire Analysis and Research Division of major large-loss fires. The NFPA's annual survey of the U.S. fire experience is an additional data source, although not the principal one. Once an incident has been identified, we request information on the fire from the fire department or the agency having jurisdiction. We also contact federal agencies that have participated in investigations, the state fire marshal's offices, and military sources.

The diversity and redundancy of these data sources enables NFPA to collect the most complete data available on large-loss fires.

About the author

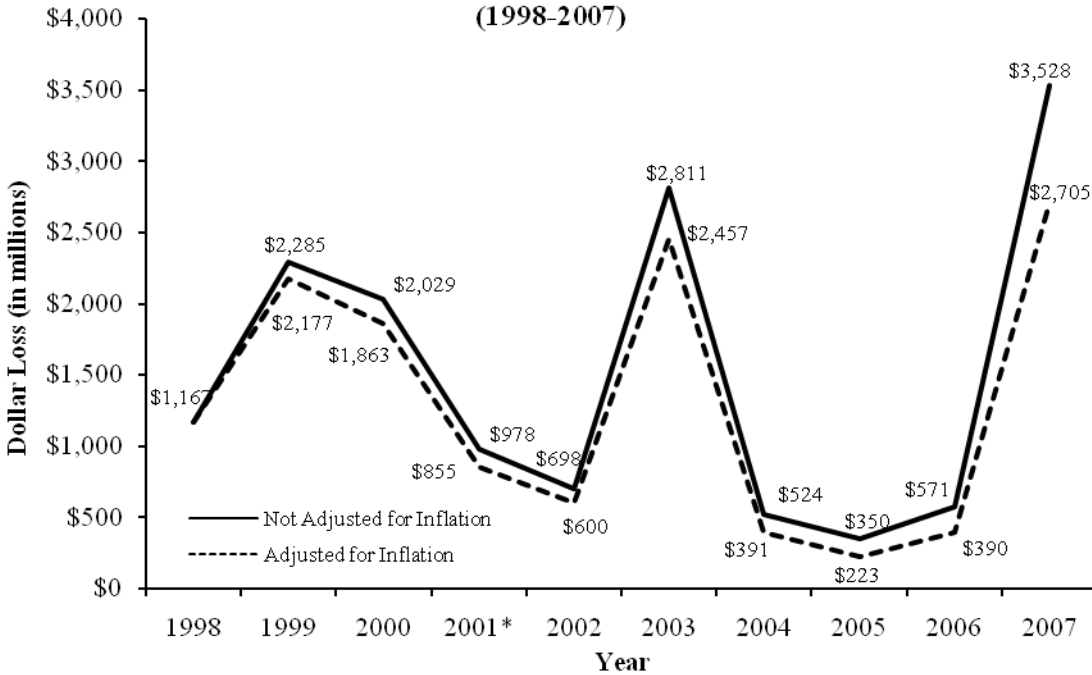
Stephen G. Badger is a member of the NFPA Fire Analysis and Research Division, and is also a retired firefighter from the Quincy, Massachusetts, Fire Department.

Figure 1
Large-Loss Fires, Unadjusted and Adjusted for Inflation
(1998 - 2007)



Note: The 52 and 42 fires in 2001 do not include the 9/11/01 World Trade Center Incident

Figure 2
Direct Dollar Loss in Large-Loss Fires, Unadjusted and Adjusted
(1998-2007)



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

Figure 3 - 2007 Large-Loss Fires by Major Property Use

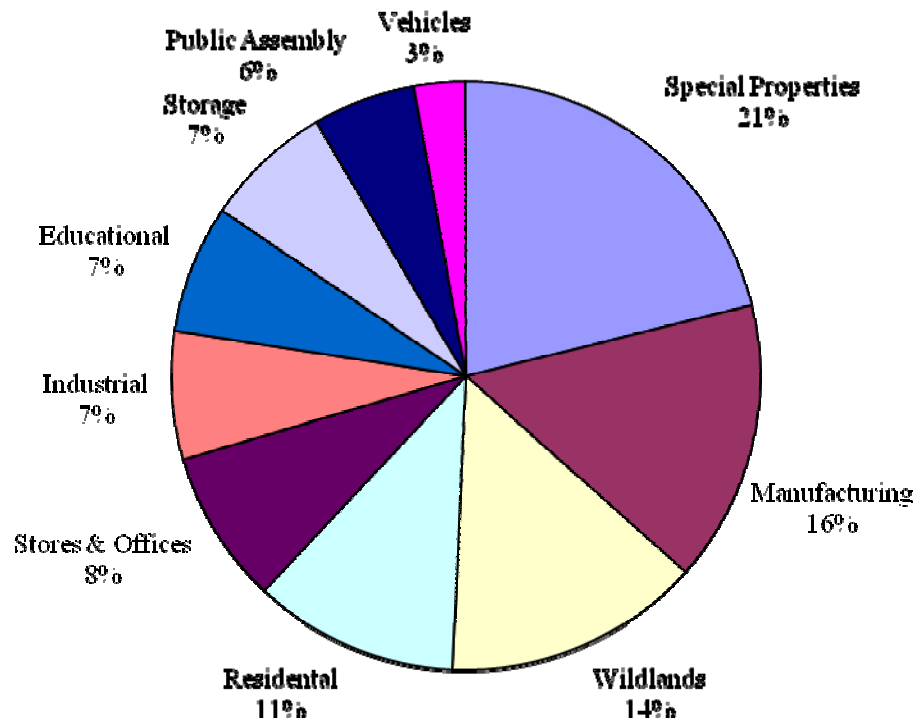


Table 1
Large-Loss Fires that Caused \$5 million or More in Property Damage, 1998 - 2007

Year	Number of Fires	Number of Fires Causing \$5 million or More in 1998 Dollars	Property Loss (unadjusted) (in millions)	Property Loss 1998 Dollars (in millions)
1998	57	57	\$1,167	\$1,167
1999	67	55	\$2,285	\$2,177
2000	65	53	\$2,029	\$1,863
2001*	52	42	\$978	\$855
2002	46	39	\$698	\$600
2003	49	42	\$2,811	\$2,457
2004	46	32	\$524	\$391
2005	39	23	\$350	\$223
2006	46	29	\$571	\$390
2007	71	55	\$3,528	\$2,705

* Excluding the 9/11/01 World Trade center Incident from the loss 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 1998 as a base year. Note that adjustment for inflation not only reduces 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 2007

Incident and Location	Loss in Millions
Wildland Fire, California	\$1,800.0
Wildland Fire, California	\$315.0
Wildland Fire, California	\$150.0
Vehicle and highway overpass system, California	\$100.0
Plastic products manufacturing plant, North Carolina	\$100.0
Wildland Fire, Georgia	\$80.4
Wildland Fire, California	\$60.0
Vacant historic hospital, New York	\$60.0
Power plant, Illinois	\$60.0
Refinery, Texas	\$50.0
Air condition filter manufacturing, Florida	\$40.0
College building, Arizona	\$34.0
Lumber yard, Illinois	\$32.4
Wildland Fire, California	\$31.0
Apartment building, Alaska	\$27.0
Business occupancy, Massachusetts	\$26.0
Historic marketplace, District of Columbia	\$20.0
Warehouse, Maryland	\$20.0
Fuel storage warehouse, Washington	\$20.0
Plastics manufacturing plant, Indiana	\$20.0
 Total 20 fires	 \$3,045.8

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

Table 3
2007 Large-Loss Fires by Major Property Use Classification

Property Use	Number of Fires	Percent of Fires	Total Dollar Loss (in millions)	Percent of Loss
Special Properties	15	21%	\$210.9	6.0%
Manufacturing	11	16%	\$269.8	7.6%
Wildlands	10	14%	\$2,474.0	70.1%
Residential	8	11%	\$78.5	2.2%
Stores & Offices	6	8%	\$100.1	2.8%
Industrial	5	7%	\$110.0	3.1%
Educational	5	7%	\$75.3	2.1%
Storage	5	7%	\$71.5	2.0%
Public Assembly	4	6%	\$30.5	0.9%
Vehicles	2	3%	\$107.5	3.0%
Totals	71	100%	\$3,528.1	100.0%

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

Table 4

Large-Loss Incidents of 2007

SPECIAL PROPERTIES

State: New York

Dollar Loss: \$60,000,000

Month: May

Time: 7:32 pm

Property Characteristics and Operating Status:

This vacant, six-story, historic psychiatric hospital was of unprotected, ordinary construction. The ground floor area was not reported. No one was in the building at the time of the fire.

Fire Protection Systems:

There was no automatic detection or suppression equipment present.

Fire Development:

This fire started when lightning struck the building during a thunderstorm.

Contributing Factors and Other Details:

Firefighters were faced with a rapidly spreading fire and approximately 26 exposed buildings, many of which were interconnected. The yard hydrant system had been shut down years earlier, forcing firefighters to locate hydrants a distance away.

State: Nevada

Dollar Loss: \$19,000,000

Month: May

Time: 6:11 pm

Property Characteristics and Operating Status:

This three-story, 147-unit condominium building of unprotected wood-frame construction was under construction. The building covered 209,800 square feet (19,500 square meters). There was a security guard at the scene when the fire broke out.

Fire Protection Systems:

There was no automatic detection or suppression equipment present.

Fire Development:

This was an incendiary fire, with no additional information reported.

Contributing Factors and Other Details:

One firefighter was injured.

State: Florida

Dollar Loss: \$15,000,000

Month: February

Time: 1:19 pm

Property Characteristics and Operating Status:

This three-story vacant hotel was of unprotected ordinary construction. The ground floor area was not reported. No one was in the building at the time of the fire.

Fire Protection Systems:

There was a complete coverage detection system but its type was not reported. The detection system had been manually disabled because it was a vacant building. There was an unknown type complete-coverage sprinkler system present. The system had been shut down prior to the fire due to rusted pipes in the entire pipe grid.

Fire Development:

This incendiary fire was set on the first story after gasoline was spread throughout the building. As a result, fire spread rapidly to the upper stories. Firefighters initiated an interior attack, but withdrew when ceiling pieces started to fall.

Contributing Factors and Other Details:

None reported.

State: Wisconsin

Dollar Loss: \$15,000,000

Month: March

Time: 3:58 am

Property Characteristics and Operating Status:

This four-story 73-unit senior living complex was under construction and nearly completed. It covered 151,600 square feet (14,100 square meters) and was of unprotected wood-frame construction. There was no one in the building at the time of the fire.

Fire Protection Systems:

There were no automatic detection or suppression systems present.

Fire Development:

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

Contributing Factors and Other Details:

Two firefighters were injured. The loss was reported as \$13,000,000 to the structure and \$2,000,000 to contents.

State: Massachusetts
Dollar Loss: \$14,000,000
Month: September
Time: 12:04 am

Property Characteristics and Operating Status:

This three-story retirement living complex covered 116,000 square feet (10,800 square meters) and was of unprotected wood-frame construction. It was under construction and there was no one in the building at the time of the fire.

Fire Protection Systems:

There were no automatic detection or suppression systems present.

Fire Development:

This incendiary fire was set in several locations.

Contributing Factors and Other Details:

One firefighter was injured.

State: California
Dollar Loss: \$12,000,000
Month: January
Time: 1:57 pm

Property Characteristics and Operating Status:

This four-story, 39-unit apartment building was of unprotected wood-frame construction and was under construction. The ground floor area was not reported. Workers were on the job site at the time.

Fire Protection Systems:

There was no detection system present. A sprinkler system was being installed at the time, but was not yet operable. The type and coverage of the system were not reported.

Fire Development:

Hot tar from a tar kettle on the roof ignited the roofing materials.

Contributing Factors and Other Details:

None reported.

State: New Jersey
Dollar Loss: \$12,000,000
Month: September
Time: 7:30 am

Property Characteristics and Operating Status:

This 40-story hotel casino was of protected noncombustible construction and covered 375,000 square feet (34,800 square meters). It was under construction and workers were at the site when the fire broke out.

Fire Protection Systems:

There was a detector system present but it was not operable at the time of the fire. There was no automatic suppression equipment.

Fire Development:

An incendiary fire was set in plastic sheeting on the exterior of the building. The fire spread up the outside of the building. No other information was reported.

Contributing Factors and Other Details:

Damage was mainly to the exterior.

State: Massachusetts

Dollar Loss: \$11,000,000

Month: April

Time: 1:53 am

Property Characteristics and Operating Status:

This four-story apartment building was of unprotected wood-frame construction and was under construction. The building covered 130,000 square feet (12,100 square meters). There was no one on the scene when the fire broke out.

Fire Protection Systems:

There was no automatic detection or suppression equipment present.

Fire Development:

The cause and origin were undetermined.

Contributing Factors and Other Details:

The complex had poor water pressure and volume available. Firefighters had trouble locating working hydrants and so were delayed in getting hose lines into operation. In addition to the building of origin, the fire destroyed a 99-unit building, two 24-unit buildings, several garages, and a dozen pieces of construction equipment, as well as tools and building materials.

State: California

Dollar Loss: \$10,000,000

Month: June

Time: 12:56 am

Property Characteristics and Operating Status:

This two-story, single-family house of unprotected wood-frame construction was under construction. No information was reported on the ground floor area. No one was at the site at the time.

Fire Protection Systems:

No information was reported on detection or suppression systems.

Fire Development:

The fire's cause was undetermined. Fire burned throughout the attic area and second-story floor joists.

Contributing Factors and Other Details:

None reported.

State: California

Dollar Loss: \$8,000,000

Month: September

Time: 5:17 pm

Property Characteristics and Operating Status:

This two-story, single-family dwelling covered 6,800 square feet (600 square meters). The type of construction was not reported but it was under construction. It was not reported if anyone was at the site at the time.

Fire Protection Systems:

There was a detection system, but its coverage and performance were not reported. No information was reported on any automatic suppression.

Fire Development:

The fire cause was listed as a part failure, resulting in natural gas igniting in a wall assembly.

Contributing Factors and Other Details:

The loss was estimated at \$6,000,000 to the structure and \$2,000,000 to the contents.

State: California

Dollar Loss: \$8,500,000

Month: June

Time: 1:49 am

Property Characteristics and Operating Status:

This four-story, 80-unit hotel of unprotected wood-frame construction was under construction, in the framing stages. The ground floor area and operating status were not reported.

Fire Protection Systems:

A detection system and automatic suppression system were being installed at the time. The types and coverage of the systems were not reported, but neither was yet operable.

Fire Development:

A fire of unknown cause broke out on the second story. Fire spread was very rapid due to the framing material. The building was fully engulfed when firefighters arrived. Radiant heat caused heavy damage to surrounding buildings, vehicles and vegetation. Arriving firefighters were unable to mount an interior attack due to the large volume of fire. Master stream devices were set up to attack the fire.

Contributing Factors and Other Details:

Loss was listed as \$2,500,000 to the original building and \$6,000,000 to the exposures.

State: Texas

Dollar Loss: \$8,500,000

Month: September

Time: 6:56 am

Property Characteristics and Operating Status:

This three-story, 49-unit motel was of unprotected wood-frame construction and was under construction. (It was due to open in a very short time.) The structure covered 60,000 square feet (5,600 square meters). It was not reported if anyone was at the site at the time.

Fire Protection Systems:

There was no information on any detection system. There was a dry-pipe sprinkler present. Its operation and coverage were not reported.

Fire Development:

No details were reported.

Contributing Factors and Other Details:

Loss to the building was listed at \$8,000,000 and \$500,000 to the contents.

State: California

Dollar Loss: \$6,617,988

Month: January

Time: 1:49 pm

Property Characteristics and Operating Status:

This four-story apartment building of unprotected wood-frame construction was under construction. No other details were reported.

Fire Protection Systems:

No details were reported.

Fire Development:

No details were reported.

Contributing Factors and Other Details:

No details were reported.

State: New Jersey

Dollar Loss: \$6,000,000

Month: June

Time: 2:27 pm

Property Characteristics and Operating Status:

This oceanside pedestrian boardwalk was of unprotected noncombustible construction, and was bordered by a row of five stores one story in height. No information was reported on the construction type of the stores, but they were open and operating. The combined area of the boardwalk and stores was approximately 20,000 square feet (1,900 square meters).

Fire Protection Systems:

There was no detection system or suppression equipment for the boardwalk. The stores had smoke detection equipment but no suppression equipment.

Fire Development:

The fire started under the boardwalk and spread rapidly into a strip of one-story beachfront stores. The cause is still under investigation.

Contributing Factors and Other Details:

The detection and suppression systems had no impact on the fire as it started under the boardwalk and rapidly spread into the stores. The loss was estimated at \$5,000,000 to the boardwalk and stores, and \$1,000,000 to contents.

State: Rhode Island

Dollar Loss: \$5,250,000

Month: July

Time: 5:45 pm

Property Characteristics and Operating Status:

This 300-foot (91-meter) long by 50-foot (15-meter) wide pier was of heavy timber construction and was operating.

Fire Protection Systems:

There was no detection equipment or automatic suppression equipment present.

Fire Development:

The fire started under the pier deck. Its cause is undetermined.

Contributing Factors and Other Details:

A crane on the pier and a fishing boat tied to the pier were destroyed. Two firefighters were injured battling this fire. The estimated loss was \$5,000,000 to the structure and \$250,000 to the contents.

MANUFACTURING PROPERTIES

State: North Carolina

Dollar Loss: \$100,000,000

Month: February

Time: 9:10 am

Property Characteristics and Operating Status:

No details were reported for this packaging plant fire.

Fire Protection Systems:

No details were reported.

Fire Development:

No details were reported.

Contributing Factors and Other Details:

No details were reported.

State: Texas

Dollar Loss: \$50,000,000

Month: February

Time: 2:09 pm

Property Characteristics and Operating Status:

No details were reported on this refinery. The plant was in operation at the time of the fire.

Fire Protection Systems:

No information was reported on detection equipment. There was a system of manual water monitors or water cannons, which the plant fire brigade attempted to use, but they proved ineffective due to strong winds and fast-spreading fire.

Fire Development:

A crack in an older pipe allowed propane to escape and form a vapor cloud. The cloud drifted and is believed to have ignited when it approached a boiler house.

Contributing Factors and Other Details:

Twenty workers were injured in this explosion and fire.

State: Florida

Dollar Loss: \$40,000,000

Month: July

Time: 9:26 pm

Property Characteristics and Operating Status:

This one-story air conditioner filter manufacturing plant was of unprotected noncombustible construction and covered 185,000 square feet (17,000 square meters). The plant was in operation at the time of the fire.

Fire Protection Systems:

No information was reported on detection equipment. There was a wet-pipe sprinkler system present. The system operated but was ineffective. The reason was not reported.

Fire Development:

This incendiary fire was set in a first-story storage area.

Contributing Factors and Other Details:

The damage was estimated at \$10,000,000 to the structure and \$30,000,000 to the contents.

State: Indiana

Dollar Loss: \$20,000,000

Month: September

Time: 2:34 pm

Property Characteristics and Operating Status:

This four-story plastics manufacturing plant was of heavy-timber construction and covered 83,800 square feet (7,800 square meters). The plant was in operation at the time. Part of this structure was used as a warehouse.

Fire Protection Systems:

There was no detection equipment present. There was a sprinkler system in the building, but the system had been disconnected prior to the fire.

Fire Development:

The fire broke out in an electric motor on a pump and auger setup in the basement of this building.

Contributing Factors and Other Details:

The fire spread throughout the basement. When the fire spread to and into an abandoned elevator shaft, it spread rapidly to the upper stories. As the fire engulfed the upper stories, command called for an evacuation of the firefighters to a defensive attack. During the original interior attack, firefighters unsuccessfully used foam in trying to gain control of the fire. The damage was estimated at \$12,000,000 to the structure and \$8,000,000 to the contents.

State: Oklahoma

Dollar Loss: \$15,000,000

Month: January

Time: 7:06 pm

Property Characteristics and Operating Status:

This one-story food seasoning manufacturing plant was of unprotected noncombustible construction and covered 58,000 square feet (5,400 square meters). The plant was in operation at the time of the fire.

Fire Protection Systems:

No information was reported on detection equipment. There was a wet-pipe sprinkler system present. It had been turned off previously because of freezing during an ice storm and cold weather, but the fire department was not notified.

Fire Development:

A fire of undetermined cause broke out on the loading dock.

Contributing Factors and Other Details:

Firefighters and civilians within a mile (1.6 kilometers) of the building were evacuated when firefighters learned that anhydrous ammonia was present, in a 30,000-pound (13,600-kilogram) container, two smaller containers and in piping throughout the structure. The fire was allowed to burn itself out.

State: Indiana

Dollar Loss: \$12,000,000

Month: February

Time: 2:44 am

Property Characteristics and Operating Status:

This fiberglass manufacturing plant was 12 feet (3.7 meters) to 40 feet (12 meters) in height and of heavy timber construction and covered 750,000 square feet (7,000 square meters). The plant was partially operating at the time of the fire; that is, the fire broke out in an area that was closed for the night but the adjacent manufacturing area was operating.

Fire Protection Systems:

There was no automatic detection equipment present. There was a partial-coverage, dry-pipe sprinkler system installed. The system operated, but its effectiveness was hindered by cold weather and a fire that was traveling horizontally above the heads. A firewall helped limit severe damage in the manufacturing area.

Fire Development:

This fire broke out in an office wall assembly when an overloaded relocateable power strip caused a malfunction in the wall outlet. The fire smoldered in the wall for a long time before it was discovered. Once smoke was detected, the employees attempted to locate the fire for

15 minutes before notifying the fire department. The fire spread vertically inside the wall assembly to the attic area and spread horizontally throughout the attic.

Contributing Factors and Other Details:

The fire-involved wall assembly had been layered over several times, with the original wall cover left in place. The walls were so layered that the thermal imaging camera could not detect heat in the walls. There were also three roofs in place due to construction add-ons that left the original roofs in place, with many void spaces making it difficult to fight this fire. One firefighter was injured in a flashover.

State: Maryland

Dollar Loss: \$8,344,000

Month: May

Time: 5:42 pm

Property Characteristics and Operating Status:

This one-story beverage machine repair building was of unprotected ordinary construction and covered 15,000 square feet (1,400 square meters). The facility was closed at the time of the fire.

Fire Protection Systems:

There was no information reported on any automatic detection equipment system. There was no automatic suppression equipment present.

Fire Development:

This fire broke out in a maintenance area in the rear of the building. Due to the destruction, the cause could not be determined. The fire spread throughout the structure and firefighters made a defensive attack on arrival.

Contributing Factors and Other Details:

Loss was estimated at \$344,000 to the structure and \$8,000,000 to the contents.

State: Georgia

Dollar Loss: \$7,500,000

Month: January

Time: 2:00 am

Property Characteristics and Operating Status:

This three-story textile recycling plant was of heavy-timber construction and covered 245,000 square feet (2,200 square meters). The plant was in operation at the time of the fire.

Fire Protection Systems:

No detection equipment was present. There was a wet-pipe sprinkler system present. Its coverage was not reported but it did activate with 75 heads opening. The system was not

effective. The system had not been maintained in some time and the heads did not have proper clearance, risers had been modified to allow use of garden-type hoses, and the valves were not fully opened.

Fire Development:

A fire of unknown cause broke out in a machinery room.

Contributing Factors and Other Details:

One civilian died in this fire and two were injured. Loss was estimated at \$2,500,000 to the structure and \$5,000,000 to the contents.

State: Pennsylvania

Dollar Loss: \$6,000,000

Month: April

Time: 7:30 pm

Property Characteristics and Operating Status:

This 2 ½-story plant that manufactured cardboard box marking equipment was of unprotected ordinary construction and covered 12,000 square feet (1,100 square meters). The plant was closed at the time.

Fire Protection Systems:

There were no automatic detection or suppression systems present.

Fire Development:

This fire broke out on the second story where an electrical short circuit ignited cardboard boxes. The fire spread throughout the second story before it vented and a passerby saw smoke and called the fire department. Employees reported smelling something burning prior to the plant closing at 5:20 pm. (No additional information was reported on this.)

Contributing Factors and Other Details:

Two firefighters were injured. The loss was reported as \$1,500,000 to the structure and \$4,500,000 to the contents.

State: Oregon

Dollar Loss: \$6,000,000

Month: April

Time: 9:29 pm

Property Characteristics and Operating Status:

This was a one-story water irrigation system manufacturing plant. The ground floor area and construction type were not reported. The plant was in operation at the time.

Fire Protection Systems:

No information was reported on detection equipment. There was no automatic suppression equipment present.

Fire Development:

A fire of unknown cause broke out in a manufacturing area. No other details were reported.

Contributing Factors and Other Details:

None reported.

State: Nebraska

Dollar Loss: \$5,000,000

Month: January

Time: not reported

Property Characteristics and Operating Status:

No details were reported describing this manufacturing plant.

Fire Protection Systems:

No details were reported.

Fire Development:

No details were reported.

Contributing Factors and Other Details:

No details were reported.

WILDLAND

State: California

Dollar Loss: \$1,800,000,000

Month: October

Time: various

Property Characteristics and Operating Status:

Wildland urban interface

These 23 major, named wildland fires broke out within a matter of days in different properties. Some fires broke out in forest areas and some were located in grassy areas in and around power lines.

Fire Development:

These fires had a variety of causes. Information on the cause of every individual fire was not reported, but some of the fires were incendiary and some were caused by downed power lines. A vehicle crash and a youngster playing with matches started other fires.

Contributing Factors and Other Details:

Santa Ana winds were blowing at 75 miles (121 kilometers) per hour with gusts of over 100 miles (161 kilometers) per hour, overwhelming firefighters early on. The area was very dry also. During these fires, an addition 251 fires broke out but were contained to 10 acres (4 hectares) or less each. A unified command was in place on each fire. Sixteen hundred fire companies from 1,145 fire departments were en route to the area in two days. The fires burned 518,000 acres (210,000 hectares), destroyed 2,180 homes, six commercial properties, 922 out buildings, 239 vehicles, and damaged another 428 homes, nine commercial properties, and 74 out buildings. Ten civilians died in the fires and at least four other deaths were attributed to the fires. In addition, 128 firefighters and 28 civilians were injured.

State: California

Dollar Loss: \$350,000,000

Month: November

Time: 3:23 am

Property Characteristics and Operating Status:

Wildland urban interface

Fire Development:

No details were reported.

Contributing Factors and Other Details:

The fire burned 4,900 acres (2,000 hectares) of dry brush, and destroyed 86 structures (including 53 residences), 37 vehicles and a mobile home or trailer. Another 45 structures (including 33 residences) were damaged. Six firefighters were injured

State: California
Dollar Loss: \$150,000,000
Month: June
Time: 2:15 pm

Property Characteristics and Operating Status:
Wildland urban interface

Fire Development:
No details were reported.

Contributing Factors and Other Details:
Thirty-one hundred acres (1,250 hectares) and 256 homes were destroyed, 35 homes were damaged, 67 commercial properties were destroyed or damaged and three civilians were injured.

State: Georgia
Dollar Loss: \$80,436,951
Month: April
Time: 1:30 pm

Property Characteristics and Operating Status:
Wildland

Fire Development:
A fallen power line ignited this fire which burned through grass, timber, and swamp land, spreading into Florida. This fire ultimately became known as the Georgia Bay Complex.

Contributing Factors and Other Details:
At the time of these fires, Georgia was experiencing a drought, and the fire danger level was listed as extreme. A total of 564,450 acres (228,400 hectares) burned, of which 441,705 (178,750) were in Georgia.

State: California
Dollar Loss: \$60,000,000
Month: January
Time: 5:01 pm

Property Characteristics and Operating Status:
Wildland urban interface

Fire Development:
No details were reported.

Contributing Factors and Other Details:
This fire destroyed six large mansions, which contributed to the high dollar loss.

State: California

Dollar Loss: \$31,000,000

Month: March

Time: not reported

Property Characteristics and Operating Status:

Wildland

Fire Development:

No details were reported.

Contributing Factors and Other Details:

No details were reported.

State: Georgia

Dollar Loss: \$15,909,184

Month: May

Time: not reported

Property Characteristics and Operating Status:

Wildland

Fire Development:

No details on the cause or spread of the fire were reported.

Contributing Factors and Other Details:

At the time of these fires, Georgia was in a drought and fire danger was listed as extreme. A total of 21,050 acres (8,520 hectares) burned.

State: New Jersey

Dollar Loss: \$10,235,450

Month: May

Time: not reported

Property Characteristics and Operating Status:

Wildland urban interface

Fire Development:

A flare or other device dropped by a military aircraft ignited vegetation near a military firing range near a pine grove. The flare ignited pitch pine needles and the spreading fire quickly crowned, eventually burning 15,550 acres (6,300 hectares), destroying three homes, and damaging 11 others. Also destroyed were four boats on trailers and two cars.

Contributing Factors and Other Details:

Hazardous pitch pine, 20 to 25 mph winds (32 to 40 kph) and temperatures in the eighties F (high twenties C) contributed to fire spread. Three firefighters were injured battling this fire.

State: Alaska

Dollar Loss: \$6,000,000

Month: June

Time: 5:34 pm

Property Characteristics and Operating Status:

Wildland

Fire Development:

Flying sparks from a grinder being used to remove a plastic coating on a shovel ignited grass. Two people working with the grinder attempted to extinguish the flames to no avail before fleeing to call 911. The grass fire spread to the tree line and eventually burned 197 structures (one home, 87 cabins and 109 outbuildings) as well as almost 57,000 acres (23,100 hectares).

Contributing Factors and Other Details:

The loss was estimated at \$5,000,000 to structures and \$1,000,000 to contents.

State: California

Dollar Loss: \$5,650,000

Month: April

Time: 1:17 pm

Property Characteristics and Operating Status:

Wildland urban interface

Fire Development:

This wildfire of undetermined cause broke out on a hillside. Upon arrival, firefighters found approximately one-half acre (0.2 hectares) of heavy brush burning with fire running up a steep grade. They made an aggressive attack while help was requested from the adjacent county. Strong winds drove the fire down the canyon towards residential structures. Hand crews and water-dropping helicopters fought the fire as additional crews were used for structure protection. One home was destroyed and two were damaged when brands fell on the roofs. The fire was controlled and extinguished after burning 15 acres (6 hectares).

Contributing Factors and Other Details:

Firefighters made successful stands and saved many homes. The loss was estimated at \$2,150,000 to the structures and \$3,500,000 to the contents.

RESIDENTIAL PROPERTIES

State: Alaska

Dollar Loss: \$27,000,000

Month: June

Time: 3:00 pm

Property Characteristics and Operating Status:

This was an occupied four-story, 49-unit apartment building. The ground floor area was not reported.

Fire Protection Systems:

There was a full coverage of smoke detection equipment that activated. There was no automatic suppression equipment.

Fire Development:

This fire broke out in a dining room wall in a fourth-story unit when a plumber's torch ignited cellulose insulation as he was sweating a valve on a pipe. The fire traveled up the wall and across to an elevator shaft and then through the roof.

Contributing Factors and Other Details:

High wind conditions pushed the fire across the entire roof. Unobstructed chases allowed the fire to travel throughout the building. The damage was estimated at \$22,000,000 to the structure and \$5,000,000 to the contents.

State: Alaska

Dollar Loss: \$12,500,000

Month: June

Time: 2:49 pm

Property Characteristics and Operating Status:

This two-story single-family home covered 1,250 square feet (120 square meters) and was occupied. The type of construction was not reported.

Fire Protection Systems:

No details were reported on detection equipment. There was no suppression equipment.

Fire Development:

The fire started outside on an exterior wall, but its exact cause was not reported.

Contributing Factors and Other Details:

Loss was \$7,500,000 to the structure and \$5,000,000 to the contents.

State: Maine
Dollar Loss: \$10,000,000
Month: August
Time: 4:53 am

Property Characteristics and Operating Status:

This occupied, four-story, 10-unit apartment building was of unprotected wood-frame construction and covered 7,200 square feet (670 square meters).

Fire Protection Systems:

There was a full coverage smoke detection system present. The system operated. There was a full coverage wet-pipe sprinkler system present but there was no coverage in the attic area. The system activated when fire spread down from the attic into living areas.

Fire Development:

A propane grill on a third-story balcony ignited wood construction members and fire spread to the soffit and undetected into and throughout the attic area.

Contributing Factors and Other Details:

Damage was estimated at \$5,000,000 to the structure and \$5,000,000 to the contents.

State: California
Dollar Loss: \$6,500,000
Month: December
Time: 2:40 am

Property Characteristics and Operating Status:

This was an unoccupied two- and three-story single-family home of unprotected ordinary construction. The ground floor area was not reported.

Fire Protection Systems:

No details were reported.

Fire Development:

No details were reported; the incident is under investigation.

Contributing Factors and Other Details:

Loss was estimated at \$4,000,000 to the structure and \$2,500,000 to the contents.

State: Colorado
Dollar Loss: \$6,000,000
Month: January
Time: 1:00 am

Property Characteristics and Operating Status:

This was an occupied three-story apartment building of unprotected wood-frame construction. No other details were given, due to on-going litigation.

Fire Protection Systems:

No details were reported due to litigation.

Fire Development:

This fire was deliberately set. No additional details were reported due to litigation.

Contributing Factors and Other Details:

Two civilians died in this fire.

State: California

Dollar Loss: \$6,000,000

Month: October

Time: not reported

Property Characteristics and Operating Status:

This was a single-family home with a ground floor area of 5,800 square feet (540 square meters). The height, type of construction and operating status were not reported

Fire Protection Systems:

No information was reported.

Fire Development:

No information was reported.

Contributing Factors and Other Details:

Loss was estimated at \$1,000,000 to the structure and \$5,000,000 to the contents.

State: Ohio

Dollar Loss: \$5,500,000

Month: October

Time: 5:01 am

Property Characteristics and Operating Status:

This was an occupied, three-story, 32-unit apartment building that covered 41,190 square feet (3,800 square meters) and was of unprotected wood-frame construction.

Fire Protection Systems:

There were smoke alarms present. No additional details were reported. There was no automatic suppression equipment.

Fire Development:

A fire of unknown cause broke out in a first-story apartment. No other details were available.

Contributing Factors and Other Details:

Estimated loss to the structure was \$3,000,000 and \$2,500,000 to the contents.

State: Massachusetts

Dollar Loss: \$5,000,000

Month: December

Time: 7:41 pm

Property Characteristics and Operating Status:

This was a five-story, 20-unit occupied apartment building of unprotected ordinary construction that covered 10,000 square feet (930 square meters).

Fire Protection Systems:

There were smoke detectors present that operated and alerted occupants. There was no automatic suppression equipment present.

Fire Development:

This fire broke out in the kitchen of a first-story apartment when an occupant disposed of smoking materials improperly.

Contributing Factors and Other Details:

There were two fatalities in this fire.

STORE & OFFICE PROPERTIES

State: Illinois

Dollar Loss: \$32,447,000

Month: May

Time: 12:03 p.m.

Property Characteristics and Operating Status:

This was a 20-foot (6-meter) high, 20,250-square-foot (1,900-square-meter) lumber yard of unprotected ordinary construction. The yard was operating.

Fire Protection Systems:

Neither automatic detection nor suppression equipment was present.

Fire Development:

Investigators reported this fire as suspicious in nature. The fire originated in the corner of the lumber yard in an open lumber shelter. The fire spread rapidly to adjoining shelters and to several mobile offices located outside the property.

Contributing Factors and Other Details:

Arriving firefighters not only faced a large fire but also exploding propane tanks, some still on the forklifts, downed power lines, and a loss of water when a water main broke early in the incident. Water flow was reestablished when hose lines were tied into an adjoining town's water supply. The original attack lines the fire department used could not control the large volume of fire firefighters found when they arrived. Additional alarms were sounded for mutual aid equipment. The fire spread to several vehicles in the yard and into the main store. One firefighter was injured. Loss to the structure was \$10,746,000 and loss to the contents of the fire building and loss to eight exposure buildings was \$21,701,000.

State: Massachusetts

Dollar Loss: \$26,000,000

Month: July

Time: 4:14 am

Property Characteristics and Operating Status:

This three-story, irregularly-shaped former mill building was used by 56 mercantile businesses and covered 350,000 square feet (32,500 square meters). It was of unprotected ordinary construction. The building was closed at the time of the fire.

Fire Protection Systems:

There was no smoke detection equipment present. There was a full-coverage combination wet- and dry-pipe sprinkler system. A sprinkler valve in the area of ignition was padlocked shut, allowing the fire to quickly overwhelm the rest of the system. The fire department was not notified that the system was shut down.

Fire Development:

Investigators believe the fire started after welding was done in the basement the day before, without a permit from the fire department.

Contributing Factors and Other Details:

Several code noncompliance issues, such as the welding and shutting down the sprinkler system, contributed to the fire. Four hundred firefighters from 78 fire departments in two states responded to this fire. Nine firefighters were injured. The loss was estimated at \$16,000,000 to the structure and \$10,000,000 to the contents.

State: District of Columbia

Dollar Loss: \$20,000,000

Month: April

Time: 12:56 a.m.

Property Characteristics and Operating Status:

This historic one-story market place covered 27,810 square feet (2,580 square meters) and was of heavy timber construction. The building was closed at the time.

Fire Protection Systems:

There was a local fire alarm system present. No further information was reported. There was no suppression equipment present.

Fire Development:

The cause and origin of the fire was undetermined.

Contributing Factors and Other Details:

Arriving firefighters initiated an interior attack but soon were withdrawn to a defensive attack, due to deteriorating fire conditions.

State: Nebraska

Dollar Loss: \$11,700,000

Month: April

Time: 5:30 P.M.

Property Characteristics and Operating Status:

This two-story department store was of unprotected ordinary construction and covered 22,400 square feet (2,100 square meters). The store was closed at the time of the fire.

Fire Protection Systems:

There was no automatic detection or suppression system present.

Fire Development:

This fire broke out in the basement when a portable work light ignited sawdust. The fire spread to cardboard then up through the structure.

Contributing Factors and Other Details:

This store was in a block of businesses that was built in the 1800s. Each business had been remodeled several times, resulting in lots of void spaces. The basement and second-story were open end to end, allowing for rapid fire spread. The loss was set at \$10,500,000 to the structure and \$1,200,000 to the contents.

State: Pennsylvania

Dollar Loss: \$5,000,000

Month: February

Time: 4:42 a.m.

Property Characteristics and Operating Status:

This two-story hardware store was of unprotected noncombustible construction and covered 62,000 square feet (5,760 square meters). It was closed at the time of the fire.

Fire Protection Systems:

There was a complete coverage of smoke detection equipment. The system operated and alerted an alarm monitoring company that in turn notified the fire department. There was no automatic suppression equipment present.

Fire Development:

The fire originated in a void area in the front of the store that was used for storage. The cause is undetermined due to the total destruction of the structure.

Contributing Factors and Other Details:

Original efforts to extinguish the fire failed. Officials decided to let the fire burn, due to the tons of insecticides, fertilizer, and other hazardous materials that were present. They also took into consideration water runoff to many nearby streams and farms. The loss was estimated at \$2,000,000 to the structure and \$3,000,000 to the contents.

State: Texas

Dollar Loss: \$5,000,000

Month: March

Time: 5:11 pm.

Property Characteristics and Operating Status:

This six-story office building was of protected non-combustible construction. The ground floor area was not reported. The building was in operation at the time of the fire, with approximately 130 people present.

Fire Protection Systems:

There were smoke detectors located in each elevator lobby for the elevators' recall system. It was not reported if these operated or not. There was a sprinkler system installed in the atrium. The system operated and kept the fire from that area. There was a standpipe system supplied by a 750 gpm (2,840 liters per minute) fire pump and a 2,500-gallon (94,600-liter) tank.

Fire Development:

A fire was set in a storage area of the fifth story. Medical supplies, including oxygen, enhanced the fire's spread down to the fourth and third stories as well as up to the sixth-story.

Contributing Factors and Other Details:

Arriving firefighters were faced with a fire in an occupied office building, with smoke from the third and fourth stories and fire from the fifth and sixth story. Firefighters initiated an interior attack and rescues at the same time. In all, firefighters rescued eight people over aerial ladders. At the same time, approximately 120 occupants either self-evacuated or were assisted by firefighters. Three civilians died, and three civilians and three firefighters were injured.

BASIC INDUSTRY, UTILITY PROPERTIES

State: Illinois

Dollar Loss: \$60,000,000

Month: November

Time: 6:52 pm

Property Characteristics and Operating Status:

This was a five- and six-story city power plant of unprotected noncombustible construction. The building covered 80,000 square feet (7,430 square meters) and was operating at the time of the explosion and fire.

Fire Protection Systems:

There was no automatic detection equipment present. There was a partial-coverage sprinkler system in the building but it was not located in the area of the fire. It was not reported if the system operated.

Fire Development:

This explosion and fire occurred when an unknown type of mechanical failure ruptured a hydrogen line. The ignition sequence is still under investigation.

Contributing Factors and Other Details:

None reported.

State: Massachusetts

Dollar Loss: \$18,000,000

Month: March

Time: 7:01 pm

Property Characteristics and Operating Status:

This was a nine-story electric generating plant of unprotected noncombustible construction that covered 500,000 square feet (46,450 square meters). It was not reported if anyone was in the facility at the time of the fire.

Fire Protection Systems:

There were detectors present. No details were reported on their coverage or operation. There was a wet-pipe sprinkler system present. The system activated, with about 25 heads opening and flowing water. The system was not effective for an unreported reason.

Fire Development:

The fire broke out in the trash hopper area. No other details were reported.

Contributing Factors and Other Details:

One firefighter was injured.

State: Tennessee

Dollar Loss: \$16,000,000

Month: May

Time: 10:14 am

Property Characteristics and Operating Status:

This was a two-story composting facility of unprotected ordinary construction that covered 111,000 square feet (10,300 square meters). The plant was operating at the time of the fire.

Fire Protection Systems:

There were no smoke detectors or automatic suppression equipment present.

Fire Development:

This fire broke out in the area of a conveyor belt motor in trash. No additional details were reported.

Contributing Factors and Other Details:

The loss was estimated at \$8,000,000 to the structure and \$8,000,000 to the contents.

State: Ohio

Dollar Loss: \$10,000,000

Month: January

Time: 9:20 am

Property Characteristics and Operating Status:

This was a 565MW coal-fired power plant of unprotected noncombustible construction. The plant was in full operation at the time of the explosion and fire. The height and ground floor area were not reported.

Fire Protection Systems:

There was no automatic detection equipment present. There was a partial coverage wet-pipe sprinkler system present (but it was not in the area of ignition). The system was reported to have operated as designed but no information was reported on the effectiveness of the system.

Fire Development:

While a hydrogen supplier was making a delivery, there was an explosion. No other details were provided.

Contributing Factors and Other Details:

The failure of a relief device was a contributing factor in this explosion. The cause of the failure and the factors that caused the explosion are still being investigated. The delivery person died and nine others were injured.

State: Texas

Dollar Loss: \$6,000,500

Month: November

Time: 7:33 am

Property Characteristics and Operating Status:

This electrical sub-station transformer was operating. No other details on the property were provided.

Fire Protection Systems:

No details were reported.

Fire Development:

A part failure in electrical equipment caused the ignition of cooling oils.

Contributing Factors and Other Details:

Loss was estimated at \$6,000,000 to the transformer and \$500 to contents.

EDUCATIONAL PROPERTIES

State: Arizona

Dollar Loss: \$34,000,000

Month: November

Time: 12:48 pm

Property Characteristics and Operating Status:

This was a three-story multi-occupancy college building of protected noncombustible construction, including a food court, student union, and conference rooms. The ground floor area was not reported. The building was in full operation.

Fire Protection Systems:

There was complete-coverage automatic detection equipment present, along with manual pull stations. This system was reported to have operated as designed. There was a partial-coverage wet-pipe sprinkler system present. The system was not in the area of the fire and did not operate.

Fire Development:

A fire of suspicious origin broke out in a second-story storage room involving some stored plastic chairs.

Contributing Factors and Other Details:

Approximately 5,000 people evacuated safely during the fire.

State: Massachusetts

Dollar Loss: \$16,000,000

Month: December

Time: 4:40 am

Property Characteristics and Operating Status:

This was a two-story community school of unprotected ordinary construction that covered 1,600 square feet (150 square meters). No one was in the building at the time of the fire.

Fire Protection Systems:

An automatic detection system was present and operated, but its type and coverage were not reported. There was no automatic suppression equipment present.

Fire Development:

The fire broke out in a first-story classroom. The cause was a mechanical failure of some

Contributing Factors and Other Details:

Three firefighters were injured fighting this fire. The loss was estimated as \$11,000,000 to the structure and \$5,000,000 to the contents.

State: Alaska

Dollar Loss: \$13,299,100

Month: June

Time: 7:16 pm

Property Characteristics and Operating Status:

This was a two-story high school that covered 47,000 square feet (4,400 square meters) and was of unprotected wood-frame construction. The building was unoccupied at the time.

Fire Protection Systems:

There were detectors present, but the coverage and operation were not reported. There was a wet-pipe sprinkler system present. Its coverage was not reported. The fire department reported the system operated but there was not enough agent available. No further explanation was given.

Fire Development:

A fire of undetermined cause broke out on the exterior roof surface. No other details were reported.

Contributing Factors and Other Details:

The loss was estimated at \$13,230,000 to the structure and \$69,100 to the contents.

State: Texas

Dollar Loss: \$7,000,000

Month: April

Time: 3:15 am

Property Characteristics and Operating Status:

No details were reported on this high school except the structure was of unprotected ordinary construction.

Fire Protection Systems:

No additional details were reported.

Fire Development:

No addition details were reported.

Contributing Factors and Other Details:

Two firefighters were injured. The loss was estimated as \$5,000,000 to the structure and \$2,000,000 to the contents.

State: Tennessee

Dollar Loss: \$5,000,000

Month: March

Time: 5:16 am

Property Characteristics and Operating Status:

This one-story elementary school was of unprotected ordinary construction and covered 87,500 square feet (8,100 square meters). The school was closed at the time of the fire.

Fire Protection Systems:

There was a smoke detection system present. The coverage and operation of the system were not reported. There was no automatic suppression equipment.

Fire Development:

This fire broke out in the attic area from an unspecified short circuit.

Contributing Factors and Other Details:

The damage was estimated at \$4,000,000 to the structure and \$1,000,000 to the contents.

STORAGE PROPERTIES

State: Maryland

Dollar Loss: \$20,000,000

Month: June

Time: 7:47 pm

Property Characteristics and Operating Status:

This was a 20-foot (6-meter) high warehouse that covered 20,000 square feet (1,860 square meters) and was of unprotected ordinary construction. It was attached to another 80,000-square-foot (7,430-square-meter) warehouse of unprotected, noncombustible construction. Both were closed for the night.

Fire Protection Systems:

There was automatic detection equipment present, but the type and coverage were not reported. There was a complete-coverage combination wet- and dry-pipe sprinkler system present. Neither system was operational, but no reason was reported.

Fire Development:

The fire broke out in a first level electrical service panel area. Some type of electrical failure ignited nearby combustibles.

Contributing Factors and Other Details:

One firefighter was injured. The loss was reported as \$10,000,000 to the structure and \$10,000,000 to the contents.

State: Washington

Dollar Loss: \$20,000,000

Month: July

Time: 5:30 pm

Property Characteristics and Operating Status:

This was a fuel storage warehouse. No additional details were reported.

Fire Protection Systems:

No details were reported.

Fire Development:

No details were reported.

Contributing Factors and Other Details:

No details were reported.

State: Connecticut
Dollar Loss: \$16,000,000
Month: September
Time: 9:47 pm

Property Characteristics and Operating Status:

This one- and two-story aircraft hangar was of unprotected ordinary construction with a heavy timber bow-joint roof and covered 34,000 square feet (3,160 square meters). The hangar was closed at the time of the fire.

Fire Protection Systems:

There was no automatic detection or suppression equipment present.

Fire Development:

A fire of unknown cause broke out in the storage/maintenance area of the hangar.

Contributing Factors and Other Details:

Fire spread was enhanced by the fuel and gas stored in the many aircraft parked inside the hangar. One firefighter suffered a fractured hand. The estimated loss was \$1,000,000 to the structure and \$15,000,000 to the contents, including several airplanes.

State: Illinois
Dollar Loss: \$8,000,000
Month: December
Time: 10:47 am

Property Characteristics and Operating Status:

This two-story, 58,800-square-foot (5,460-square-meter) magazine distribution warehouse was of unprotected ordinary construction. The facility was open and operating.

Fire Protection Systems:

No information was reported on any automatic detection equipment. There was a wet-pipe sprinkler system of unreported coverage present. It did not operate, as it had been shut down prior to the fire. There was also a yard hydrant system.

Fire Development:

A truck hit an interior gas line and ruptured it. A still-unknown source ignited the escaping natural gas. Shortly thereafter, flames spread throughout the structure.

Contributing Factors and Other Details:

An interior attack was initiated but the volume of smoke and fire forced firefighters to withdraw. Firefighters learned the suppression system and several yard hydrants had been shut down, causing one engine company to relocate to find a usable hydrant. The estimated loss was \$2,000,000 to the structure and \$6,000,000 to the contents.

State: California

Dollar Loss: \$7,503,500

Month: July

Time: 1:44 am

Property Characteristics and Operating Status:

This one-story warehouse storing air conditioning units was of unprotected ordinary construction and covered 13,125 square feet (1,220 square meters). The warehouse was closed for the night.

Fire Protection Systems:

There was no automatic detection or suppression equipment present.

Fire Development:

A stolen vehicle was parked adjacent to a set of roll-up doors. Gasoline was spread on the car and ignited. The fire extended into the building's interior and throughout the structure.

Contributing Factors and Other Details:

None were reported. The loss was estimated as \$1,500,000 to the structure, \$6,000,000 to the contents and \$3,500 to the vehicle.

PUBLIC ASSEMBLY PROPERTIES

State: District of Columbia

Dollar Loss: \$12,000,000

Month: April

Time: 1:00 pm

Property Characteristics and Operating Status:

This two-story public library was of protected noncombustible construction. The ground floor area was not reported. The operating status was not reported but there were contract workers working on the exterior of the building and maintenance workers inside.

Fire Protection Systems:

There was a partial coverage smoke detection system present that was reported to have operated. There was no suppression equipment present.

Fire Development:

The fire began in the cornice area at the roofline when an electric heat gun ignited combustibles. The fire spread into and through the attic area.

Contributing Factors and Other Details:

One contractor was treated for smoke inhalation suffered as he attempted to extinguish the fire with a hand held extinguisher.

State: Michigan

Dollar Loss: \$7,000,000

Month: February

Time: 9:20 pm

Property Characteristics and Operating Status:

This one-story country club covered 13,345 square feet (1,240 square meters) and was of unprotected wood-frame construction. The club was closed for the night.

Fire Protection Systems:

There was a smoke detection system present. Its coverage was not reported but it operated. There was a full-coverage wet-pipe sprinkler system present. The system operated, but there was no information on its effectiveness.

Fire Development:

Investigators believe the fire started in the attic, but the cause is listed as undetermined

Contributing Factors and Other Details:

On arrival, firefighters found heavy smoke showing. After several attempts at an interior attack, all firefighters were withdrawn to a defensive attack. At the time of the fire, the

temperature was 7 degrees (F) (-14 degrees C) with a wind chill of -23 degrees (F) (-31 degrees C). Ice and snow on the ground created hazardous operating conditions for the firefighters. One firefighter was injured. The loss was estimated at \$4,000,000 to the structure and \$3,000,000 to the contents.

State: Iowa

Dollar Loss: \$6,500,000

Month: April

Time: 02:43 am

Property Characteristics and Operating Status:

This three-story church was of unprotected ordinary construction and covered 15,000 square feet (1,390 square meters). At the time of the fire, the church was closed.

Fire Protection Systems:

There was an automatic detection system present. Its type and coverage were not reported, but the system did operate and notified the fire department who responded in two minutes. There was no suppression equipment present.

Fire Development:

This fire was set to cover a break-in at the church. Where or how the fire was ignited was not reported.

Contributing Factors and Other Details:

An arrest has been made in this case.

State: Texas

Dollar Loss: \$5,000,000

Month: February

Time: 03:50 am

Property Characteristics and Operating Status:

This two-story church was of unprotected ordinary construction and covered 18,750 square feet (1,740 square meters). At the time of the fire, the church was closed.

Fire Protection Systems:

There was an automatic detection system present. Its type and coverage were not reported, but it did operate. There was no suppression equipment present.

Fire Development:

This fire broke out when a lamp on a second-story hallway table ignited nearby combustibles.

Contributing Factors and Other Details:

The loss was estimated at \$4,250,000 to the structure and \$750,000 to the contents.

VEHICLES

State: California

Dollar Loss: \$100,036,000

Month: April

Time: 3:45 am

Property Characteristics and Operating Status:

This fire involved a gasoline tank truck on an interstate highway at a point where several levels (a maze) of overpasses pass over each other or nearby.

Fire Development:

Following a crash of the gasoline tank truck the gasoline ignited. The intense fire weakened structural members of the interstate overpass, causing a collapse of the roadway. Firefighters using ladder pipes and large capacity hand lines were able to cool surrounding structures to minimize the possibility of further collapse.

Contributing Factors and Other Details:

Firefighters monitored run off and nearby storm drains to minimize environmental impact. The truck driver escaped the crash, suffering burns.

State: Florida

Dollar Loss: \$7,500,000

Month: May

Time: 06:54 am

Property Characteristics and Operating Status:

Landfill. No other details were reported.

Fire Development:

A fire originated in the engine area of a piece of heavy, earth-moving equipment.

Contributing Factors and Other Details:

None reported.