

Large-Loss Fires for 2004

The direct property loss in large-loss fires was down 81 percent



EACH YEAR, NFPA REPORTS on large fire and explosion losses in the United States, defined as events that resulted in property damage of at least \$5 million. In 2004, U.S. fire departments responded to 1,550,500 fires. These fires caused an estimated loss of \$9.79 billion.¹ Many of them were small with little or no property damage reported; however, 46 resulted in losses of \$5 million or more each.² Together, these large-loss fires resulted in \$524 million in direct property loss, and injured 17 firefighters and 16 civilians. Despite the fact that these fires accounted for only .003 percent of all the fires estimated to have occurred in the United States last year, they accounted for 5.4 percent of the total estimated dollar loss.

The direct property loss in large-loss fires for 2004 was down 81 percent from the corresponding figure in 2003, when the loss was \$2.8 billion, and down 25 percent from 2002. The high losses in 2003 were primarily due to two wildland fires in California, where the combined loss was over \$2.0 billion.

Even before inflation adjustments, the number of large-loss fires in 2004 was tied as the second lowest total in the 10 years since 1995 (see Table 1 and Figure 1 and Figure 2).³ When adjusted for inflation to 1995 dollars, the number of fires that occurred in 2004 that could be categorized as large-loss (i.e., loss of \$5 million in 1995 dollars) drops to 27, with a total adjusted loss of \$342 million. This is the lowest number of large-loss fires since 1995. The adjusted loss is still the lowest in the 10-year period and is 72 percent lower than the 10-year average adjusted loss total.

The number of large-loss fires and explosions and the losses in these fires are volatile and has shown no consistent trend.

Costliest Fire in 2004

At 12:30 a.m., a fire broke out in a 240,000-square foot (22,296-square meter) automobile parts distribution center. The incendiary fire was set in rack storage of parts, most of which were coated with protective petroleum-based jelly. The fire spread quickly due to this coating, a lack of in-rack sprinklers, and strong winds. No other information on the presence of smoke detection equipment is available. A sprinkler system was present and operated. The company Web site reported that the fire resulted in the loss of substantially all the facility's equipment and inventory. Since the fire, an employee has plead guilty to the crime and been sentenced to jail. Authorities have released no other information.

This fire was one of 16 fires that caused a loss of \$10 million or more in property dam-

SUMMARY

- The direct property loss in large-loss fires for 2004 was down 81 percent from the corresponding figure in 2003, when the loss was \$2.8 billion, and down 25 percent from 2002.
- Even before inflation adjustments, the number of large-loss fires in 2004 was tied as the second lowest total in the 10 years since 1995.
- The number of large-loss fires and explosions and the losses in these fires are volatile and has shown no consistent trend.
- Large-loss fires occurred in every major property category except health care and correctional facilities.
- The full report is available on the Web at www.nfpa.org/Research/.

age last year (see Table 2). Together these 16 costliest incidents resulted in a combined loss of \$336.7 million. This represented 64.3 percent of the total dollar loss in the 46 large-loss fires for 2004, and 3.4 percent of the total U.S. fire loss in 2004.

Where the fires occurred

Large-loss fires occurred in every major property category except health care and correctional facilities (see Table 3 and Figure 3). Thirteen fires occurred in special properties, resulting in \$124.7 million in property loss. Eight large-loss fires occurred in residential properties, resulting in \$47.5 million in property loss. Seven fires occurred in manufacturing properties resulting in \$108.5 million in property loss. There were six fires in storage properties, resulting in \$138.8 million in prop-

erty loss. There were three vehicle fires resulting in \$30.0 million in property loss, and three fires in stores and office properties, two of which were stores and one in an office, resulting in \$21.0 million in property loss, or \$10.0 million and \$11.0 million respectively. There were two fires each in outside properties and educational properties, resulting in \$21.2 million and \$13.6 million, respectively. There was one fire each in industrial and public assembly properties, resulting in \$10.8 million and \$8.0 million, respectively

Nearly all (41 of 46) of the large-loss fires for 2004 occurred in structures, with a combined loss of \$472.8 million. Two outside fires and three vehicles accounted for the rest of the fires. Twenty-one of the 41 structure properties were operating at the time of the fire, including 14 at full operation, two partially operating, and five construction sites where work was ongoing. Another 14 were closed or had no one on the site. The operating status of the other six structures was unknown or not reported.

Five of the 24 structure fires with known causes were intentionally set, as was the outside fire. These six fires accounted for 13 percent of last year's large-loss fires, and resulted in a combined property loss of \$47.9 million, or 9.1 percent of the loss in these large-loss fires.

Seventeen fires broke out between 11 PM and 7 AM. Twelve of these properties were unoccupied. Four were occupied to some extent and the operating status of the last one was not reported.

Detection and suppression systems

Of the 41 structure fires, 16 were in properties that had no automatic detection equipment present. Some form of automatic detection equipment protected 16 properties, and its unknown or not reported if the other nine properties had any detection equipment at all. This means that 50 percent of the properties for which the presence of detection equipment was known, had some type of automatic detection system.

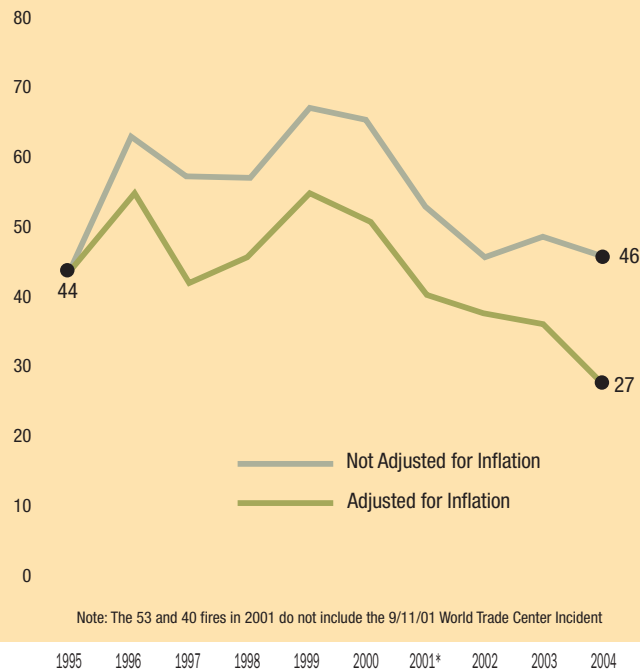
Of the 16 structures protected by an automatic detection system, five had complete coverage - four by smoke detection equipment and one by an unreported type system. Three properties had partial coverage by automatic detection equipment two by smoke alarms and one by heat detection. The extent of coverage of detection equipment in the other eight properties was not reported. Seven had smoke

TABLE 1 - Large-Loss Fires that Caused \$5 million or More in Property Damage, 1995-2004

| Year | Number of Fires | Number of Fires Causing \$5 million or More in 1994 Dollars | Property Loss (unadjusted) (in millions) | Property Loss 1994 Dollars (in millions) |
|-------|-----------------|---|--|--|
| 1995 | 44 | 44 | \$1,362 | \$1,362 |
| 1996 | 63 | 55 | \$1,544 | \$1,461 |
| 1997 | 57 | 42 | \$885 | \$769 |
| 1998 | 57 | 46 | \$1,167 | \$1,039 |
| 1999 | 67 | 55 | \$2,285 | \$2,036 |
| 2000 | 65 | 51 | \$2,029 | \$1,732 |
| 2001* | 53 | 40 | \$978 | \$784 |
| 2002 | 46 | 38 | \$698 | \$556 |
| 2003 | 48 | 36 | \$2,785 | \$2,252 |
| 2004 | 46 | 27 | \$524 | \$342 |

* 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 to is based on the Consumer Price Index using 1995 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.

FIGURE 1 - Large-Loss, Unadjusted and Adjusted for Inflation (1995-2004)



detection systems and one was not reported.

Ten of the 16 systems operated. Two did not operate; one because of dead batteries and one system was missing batteries. The operation of the other four systems was not reported.

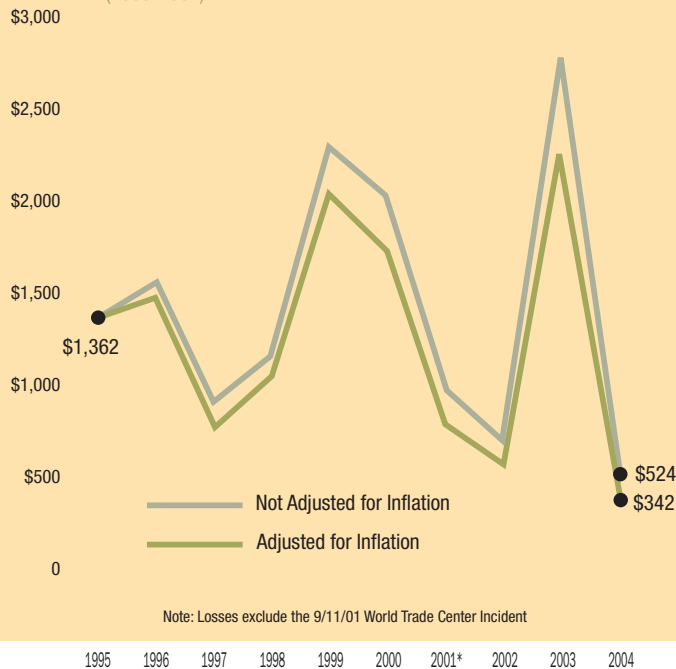
Of the 41 structures involved in large-loss fires in 2004, only 10 were known to be equipped with automatic suppression equipment. Twenty-five had no automatic suppression equipment, and it is unknown or was not reported whether the other six properties had any type of suppression equipment present. This means that 29 percent of the

PHOTOGRAPH: AP/WIDE WORLD

TABLE 2 - Large-Loss Fires of \$10 Million or More in 2004

| Incident and Location..... | Loss in Millions |
|---|------------------|
| Automobile parts storage, Tennessee | 100.00 |
| Chemical manufacturing, Georgia | 50.00 |
| Apartment building under construction, Nebraska | 40.00 |
| Dairy products manufacturing, Minnesota | 15.00 |
| Saw mill, Ohio | 15.00 |
| Aircraft, Colorado | 12.00 |
| Vehicle and highway overpass, Connecticut | 11.20 |
| Building under construction, Texas | 11.00 |
| Store, Georgia | 11.00 |
| Electric power plant, Hawaii | 10.75 |
| Storage, Washington | 10.50 |
| Electronics equipment storage, Minnesota | 10.25 |
| Manufacturing plant, California | 10.00 |
| Building under construction, California | 10.00 |
| Aircraft, Minnesota | 10.00 |
| Storage, Utah | 10.00 |
| Total -16 Fires | \$336.70 |

FIGURE 2 - Direct Dollar Loss in Large-Loss, Unadjusted and Adjusted (1995-2004)



structures for which the presence of automatic suppression equipment was known were equipped with some sort of system.

Six of the 10 protected properties had complete coverage sprinkler systems. Four had a wet-pipe system, one had a dry-pipe system, and one had unknown type system. One property had partial sprinkler system coverage of an unreported type. The extent of coverage for three was not reported. One had a wet-pipe sprinkler system, and two systems were not described.

Suppression systems operated in four of the 10 properties protected; and four systems did not operate. The operation of the last two sys-

tems was unknown or not reported. One of the systems that operated was effective in controlling or extinguishing the fire. Three systems were ineffective due to, respectively, being inadequate water flow, being overpowered by the fire spread, and inability to reach the seat of the fire. (The last was effective in controlling the fire spread.) Of the four that did not operate, two systems were not completely installed and were not operational, one system had been shut down before the fire due to a leak, and an explosion damaged another.

Table 4 shows that of the 32 structures with detection and suppression systems fully reported, four had detection and suppression systems, five had just an automatic suppression system. Three of these five structures were under construction with the system installed but not operational, and one was operational but shut down due to a leak. Twelve had just an automatic detection system, and 11 had neither. Six of these 11 structures were under construction and not at the stage where these systems could be installed.

What we can learn

In 2004, the number of large-loss fires fell by two, and the direct property loss was comparable to 2003 except for the two unusually large losses in two wildland fires. In eight of the past 10 years, 1995 to 2004, there had been at least one fire with direct property loss in excess of \$100 million.

In 2004, there was one fire with a loss of \$100 million, or 19.1 percent of the total large-loss fire loss. In three of the past 10 years, there has been a billion dollar loss fire. This was not one of those years.

Each year the large-loss fire study reports on the fraction of fires accounting for major losses that occurred in properties both protected and not protected by automatic detection or suppression systems. Each year, large-loss fires are reported in properties with no automatic detection or suppression systems, partial protection, or systems rendered ineffective by actions or omissions made before fire began. Such was the case again this year. Initial explosions or structural collapse, also sometimes damage a system to the point of being inoperable or ineffective, and sometimes systems were installed but not completed.

Adherence to the fire protection principles reflected in NFPA's codes and standards is essential to reducing the occurrence of large-

loss fires and explosions in the United States. Human error or negligence is a major contributing factor in today's fires, but proper design, maintenance, and operation of fire protecting systems and features can keep a fire that starts through human error from becoming a large-loss fire.

Reducing the risk of explosions is also important. Proper construction, storage methods, and housecleaning will make fires less likely and help control or limit the fire spread if fire occurs.

Where We Get Our Data

NFPA collects its data 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. NFPA's annual survey of the U.S. fire experience is an additional data source, although not the principal one. We also contact federal agencies that have participated in investigations, the state fire marshal offices, and military sources. Once an incident is identified, we request information from the fire department or the agency having jurisdiction. The diversity and redundancy of these data sources enables NFPA to collect the most complete data available on large-loss fires. 🔥

Acknowledgments

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 information to 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 Norma Candeloro for providing the support this study requires.

Endnotes

1. Michael Karter Jr. "Fire Loss In The United States During 2004," Abridged Report, June 2005.
2. The 46 large-loss fires of 2004 are those for which losses were reported and verified.
3. Figures for prior years are adjusted for late arriving information and so may not match previously published figures.

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FIGURE 3 - Large-Loss Fires by Major Property Use

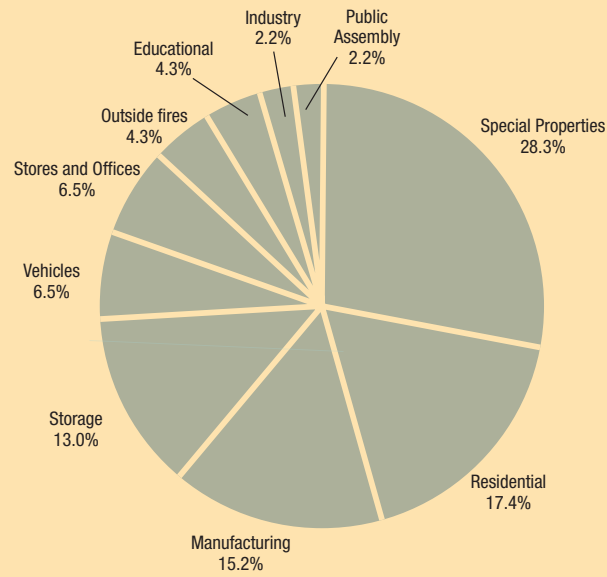


TABLE 3 - Large-Loss Fires by Major Property Use Classification

| Property Use | Number of Fires | Percent of Fires | Total Dollar Loss (in millions) | Percent of Loss |
|--------------------|-----------------|------------------|---------------------------------|-----------------|
| Special Properties | 13 | 28.3% | \$124,700,000 | 23.8% |
| Residential | 8 | 17% | \$47,500,000 | 9.1% |
| Manufacturing | 7 | 15% | \$108,501,000 | 20.7% |
| Storage | 6 | 13% | \$138,750,000 | 26.5% |
| Vehicles | 3 | 7% | \$30,010,000 | 5.7% |
| Stores and Offices | 3 | 7% | \$21,000,000 | 4.0% |
| Outside fires | 2 | 4% | \$21,200,000 | 4.0% |
| Educational | 2 | 4% | \$13,572,000 | 2.6% |
| Industry | 1 | 2% | \$10,750,000 | 2.1% |
| Public Assembly | 1 | 2% | \$8,000,000 | 1.5% |
| Totals | 46 | 100% | \$523,983,000 | 100.0% |

TABLE 4 LARGE-LOSS FIRE INCIDENTS OF 2004

**Special Properties**

NEBRASKA
Dollar Loss: \$40,000,000
Month: January
Time: 11:30 PM

Property Characteristics and Operating Status:
This nine-story 100-plus-unit apartment building was of heavy-timber construction and covered 205,000 square feet (19,045 square meters). The building was under construction at the time. No one was at the site when the fire broke out.

Fire Protection Systems:
There was no smoke detection equipment present. There was a wet pipe sprinkler system installed but it was not yet operational. The coverage of the system was not reported.

Fire Development:
During the day, workers had used cutting tools in an elevator shaft on the ninth story. An ember fell into a pile of construction debris where it smoldered unnoticed. After workers had left for the day, the fire broke out and was discovered by a person in an adjacent building. Upon arrival, firefighters found fire on the ninth-story and roof of the structure. The fire spread laterally across the upper floors and vertically via the elevator shaft and when an upper floor collapsed.

Contributing Factors and Other Details:
Firefighters halted an initial interior fire attack which proved unable to cope with the large volume of fire on the upper stories.

TEXAS
Dollar Loss: \$11,000,000
Month: August
Time: 5:56 PM

Property Characteristics and Operating Status:
This four-story 100-unit apartment building was of unprotected wood-frame construction covering 32,000 square feet (2,972 square meters). The building was under construction at the time. Some workers were at the site when the fire broke out.

Fire Protection Systems:
There was no detection equipment yet installed. There was a complete coverage wet-pipe sprinkler present but it was shut down before the fire due to a leak in the system.

Fire Development:
A fire of unknown cause broke out on the second level of the building. Wind helped spread the fire throughout the units in the section of the building that was still in the framing phase. The fire spread to a parking garage then ignited a structure on the opposite side of the street.

Contributing Factors and Other Details:
Despite openings not yet protected by fire-rated doors, fire walls were effective in limiting the spread of fire. Two firefighters were injured.

CALIFORNIA
Dollar Loss: \$10,000,000
Month: January
Time: 7:29 PM

Property Characteristics and Operating Status:
The structure was under construction; no other information was reported.

Fire Protection Systems:
No information reported.

Fire Development:
This incendiary fire was set on the second-story. No other information was reported.

Contributing Factors and Other Details:
No information reported.

KANSAS
Dollar Loss: \$8,500,000
Month: March
Time: 2:22 AM

Property Characteristics and Operating Status:
This four-story senior citizen center was of unprotected wood-frame construction and covered 144,000 square feet (13,378 square meters). The building was under construction and no one was on the site at the time of the fire.

Fire Protection Systems:
There was no automatic smoke detection or suppression system present.

Fire Development:
This incendiary fire was set on the first-story using available materials. Openings in the construction and doors left open contributed to the fire's spread. This was the second fire at this building in

TABLE 4 LARGE-LOSS FIRE INCIDENTS OF 2004



two days, and one of a series of arson fires in the area.

Contributing Factors and Other Details:

One firefighter was injured. Loss to the structure was estimated at \$8,000,000 and \$500,000 to the contents.

MARYLAND

Dollar Loss: \$8,000,000

Month: November

Time: 8:25 AM

Property Characteristics and Operating Status:

This three- and four-story historic courthouse was of unprotected ordinary construction. The ground floor area was not reported. Part of this building was undergoing renovations. In that section, there were construction workers on site. The newer section of the courthouse was open and partially operating with workers arriving for the day.

Fire Protection Systems:

There was an automatic detection system present. The type and coverage were not reported. The system activated. There was a sprinkler system present, but no information was reported on it.

Fire Development:

The fire broke out in temporary lighting in the attic area of the section undergoing renovations. The exact ignition sequence was not reported.

Contributing Factors and Other Details:

Firefighters successfully battled to keep the fire from extending horizontally to the newer section of the courthouse.

Residential Properties

WYOMING

Dollar Loss: \$8,000,000

Month: March

Time: 3:33 PM

Property Characteristics and Operating Status:

This two-story college dormitory was of protected noncombustible construction. The ground floor area was not reported. The dorm was occupied.

Fire Protection Systems:

There was a system of automatic smoke detection equipment present. The coverage was not reported but the system did operate. There was no

suppression system present.

Fire Development:

An overheated power-strip plug (relocateable power tap) on a wall heated the wall fastenings to a point of failure. The relocateable power tap fell to the floor at the end of the bed and continued to heat and ignited nearby combustibles. The fire was contained to the upper floor.

Contributing Factors and Other Details:

Four students were treated at the hospital for smoke related injuries.

MARYLAND

Dollar Loss: \$7,000,000

Month: March

Time: 5 PM

Property Characteristics and Operating Status:

This two-story single-family home was of protected wood-frame construction and covered 14,000 square feet (1,300 square meters). The home was occupied at the time of the fire.

Fire Protection Systems:

There was a complete coverage smoke detection system present in the house, all levels and sleeping areas were covered. There was no detection equipment in the garage, where the fire originated. It is not known if the system activated in the house. There was no suppression system present.

Fire Development:

Juveniles playing with matches ignited newspapers in the garage. A cardboard box was used to smother and extinguish the fire. Not realizing that the box was burning, the juveniles placed it in a trash pile in the garage and went into the house. Upon leaving the house about 20 minutes later, they found the garage well-involved with fire. Upon arrival, firefighters found that the fire had spread into the attic of the house.

Contributing Factors and Other Details:

No one met the firefighters upon their arrival, so crews began searching the house for possible occupants in need of rescue, which delayed their initial suppression activities. This house was in a rural area with no municipal water supply.

Manufacturing Properties

GEORGIA


TABLE 4 LARGE-LOSS FIRE INCIDENTS OF 2004

Dollar Loss: \$50,000,000
 Month: May
 Time: 4:25 AM

Property Characteristics and Operating Status:
 This one-story chemical manufacturing plant was of protected ordinary construction and covered 400,000 square feet (37,161 square meters). The plant was in operation at the time.

Fire Protection Systems:
 There was no automatic detection equipment present. There was a complete coverage wet-pipe sprinkler system present. The system activated but was overpowered by the spreading fire. The reason for this was not reported.

Fire Development:
 A fire broke out when a chemical reaction occurred in the warehouse area of the plant. The chemicals involved were not identified.

Contributing Factors and Other Details:
 Very heavy smoke covered the area, causing local officials to evacuate many downwind of the fire. Damage to the structure was estimated at \$20,000,000 and \$30,000,000 to the contents.

OHIO
 Dollar Loss: \$15,000,000
 Month: March
 Time: 7:54 PM

Property Characteristics and Operating Status:
 This 50-foot (15-meter) tall sawmill was of protected wood-frame construction. The ground floor area and operating status were not reported.

Fire Protection Systems:
 There was no information reported on automatic detection equipment. There was no automatic suppression equipment.

Fire Development:
 This suspicious fire broke out in bulk storage of wood product.

MINNESOTA
 Dollar Loss: \$15,000,000
 Month: December
 Time: 6:13 PM

Property Characteristics and Operating Status:

This two-story dairy product plant was of unprotected ordinary construction and covered 200,000 square feet (18,580 square meters). The plant was in full operation at the time of the fire.

Fire Protection Systems:
 There was a smoke detection system present. Its coverage and performance were not reported. There was a local coverage sprinkler system present. Its type, activation and performance were not reported.

Fire Development:
 A malfunction in a compressor in a second-story machine room caused an explosion and fire which extended to the warehouse section.

Contributing Factors and Other Details:
 Melted butter made for slippery footing at the fire scene. The loss was estimated at \$5,000,000 to the structure and \$10,000,000 to the contents.

CALIFORNIA
 Dollar Loss: \$10,000,000
 Month: July
 Time: 1:22 PM

Property Characteristics and Operating Status:
 This 10-story manufacturing plant covered 30,000 square feet (2,787 square meters). The type of product manufactured there and the type of building construction were not reported. The plant was in full operation at the time the fire broke out.

Fire Protection Systems:
 There was a complete coverage smoke detection system present. The system operated and alerted the occupants. There was a complete coverage wet-pipe sprinkler system present. This system operated and contained the fire. The water flow alarm notified the fire department.

Fire Development:
 A heater in a basement manufacturing area ignited nearby plastic materials. No information was reported on the fire's spread.

Contributing Factors and Other Details:
 Damage was estimated at \$5,000,000 to the structure and \$5,000,000 to the contents. Much of the loss was in a laboratory in the basement.

OREGON

TABLE 4 LARGE-LOSS FIRE INCIDENTS OF 2004



Dollar Loss: \$8,501,000
Month: March
Time: 8:21 AM

Property Characteristics and Operating Status:
This one-story petroleum recycling plant was of heavy-timber construction. The plant was in full operation at the time.

Fire Protection Systems:
No information was reported on any detection equipment. There was a complete coverage dry-pipe sprinkler system present. The system operated, but its rate of application was insufficient to control the fire.

Fire Development:
A spark from an oxy/acetylene cutting torch fell into an open sludge-oil pit and ignited the contents instantaneously. The fire grew out of control quickly despite the activation of the sprinkler system. The fire spread through several businesses inside the building.

Contributing Factors and Other Details:
Firefighters reported insufficient water pressure in hydrants originally. Two firefighters were injured. Damage to the structure was estimated at \$3,000,000 and \$5,501,000 to the contents.

Storage Properties

TENNESSEE
Dollar Loss: \$100,000,000
Month: March
Time: 12:19 AM

Property Characteristics and Operating Status:
This was an auto parts storage warehouse containing 244,000 square feet (22,668 square meters) of rack storage. The height and type construction were not reported.

Fire Protection Systems:
No information was reported on automatic detection. There was a sprinkler system present and operated, but there was no in-rack suppression equipment. The coverage and effectiveness of the sprinkler system was not reported.

Fire Development:
An incendiary fire was set by a worker looking to get off from work for the night. The arsonist has been found guilty and is serving prison time.

Contributing Factors and Other Details:

Fire spread was rapid due to a petroleum based jelly coating on the auto parts in racks with no in-rack sprinkler system. A strong wind through the open doors helped fan the fire. Three firefighters were injured.

MINNESOTA
Dollar Loss: \$10,250,000
Month: November
Time: 6:03 AM

Property Characteristics and Operating Status:
This 1-story electronic equipment warehouse was of unprotected non-combustible construction and covered almost 10,000 square feet (929 square meters). The warehouse was closed for the weekend at the time of the fire.

Fire Protection Systems:
There was no automatic smoke detection system or suppression system present.

Fire Development:
A gas water heater in the mezzanine level above office space ignited paper records. The fire burned records and the office space. Fire officials estimated that the fire burned for up to hours unnoticed and created a tremendous amount of heat throughout the warehouse. A passerby discovered the fire and called 911.

Contributing Factors and Other Details:
The water heater was in poor operating condition and clearance was not maintained with the paper product. Loss was estimated at \$250,000 to the structure and \$10,000,000 to the contents which was electronic equipment.

MINNESOTA
Dollar Loss: \$8,000,000
Month: July
Time: 5:50 AM

Property Characteristics and Operating Status:
This was a 120,000-gallon (5,450-kiloliter) slurry oil storage tank in a refinery. The refinery was operating at the time of the fire.

Fire Protection Systems:
No automatic detection or suppression equipment present.

Fire Development:
Lightning struck the top of this storage tank. The


TABLE 4 LARGE-LOSS FIRE INCIDENTS OF 2004

top of the tank lifted off and oil ignited. The fire melted part of the side of the tank and some product escaped.

Vehicle

COLORADO
Dollar Loss: \$12,010,000
Month: November
Time: 10 AM

Property Characteristics and Operating Status:

An 18-passenger corporate jet crashed on takeoff near the end of the runway and slid about 1,400 feet (426 meters) in a field. At the time there was light snow and mist. At the time of the crash and fire there were six passengers on board

Fire Development:

A post impact fire ensued, destroying the aircraft. During the crash, aviation fuel was released and ignited, engulfing the aircraft.

Contributing Factors and Other Details:

Three people died in the crash of impact-related injuries, and three others survived. Loss to the aircraft was estimated at \$12,000,000 and \$10,000 to the contents.

MINNESOTA

Dollar Loss: \$10,000,000
Month: April
Time: 7:14 PM

Property Characteristics and Operating Status:

This fire involved a military aircraft on landing on an airport runway.

Fire Development:

An Air National Guard C-130 aircraft reported an unsafe landing gear prior to landing. Just after landing and during roll out, the right wing tip, prop and engine all hit the ground. The landing gear collapsed and the engine burst into flames. Fire apparatus on scene due to the alert of a pending problem extinguished the fire in a short time.

FLORIDA

Dollar Loss: \$8,000,000
Month: April
Time: 6:39 PM

Property Characteristics and Operating Status:

A yacht at a marina pier

Fire Development:

The cause and origin of this fire has not been determined. Upon arrival, firefighters reported light smoke showing from the yacht. During initial set up of hose lines, the fire on the yacht flashed over and firefighters went to a defensive attack.

Contributing Factors and Other Details:

Two crew members and two good Samaritans who tried to extinguish the fire were injured.

Store and Office Properties

GEORGIA
Dollar Loss: \$11,000,000
Month: June
Time: 11:59 PM

Property Characteristics and Operating Status:

This two-story sporting goods store was of unprotected noncombustible construction and covered 100,000 square feet (9,290 meters). The store was closed at the time of the fire.

Fire Protection Systems:

There was an automatic smoke detection system present that operated. The coverage of the system was not reported. There was no suppression system present.

Fire Development:

A fire of undetermined cause broke out in the storage area of this store. Firefighters making an interior attack were faced with a flashover as the door to the fire area was opened. Firefighters withdrew to a defensive attack at that point.

Contributing Factors and Other Details:

During the fire, multiple rounds of ammunition discharged and several kegs of black powder exploded. The owner had made firefighters aware of these contents as well as a large amount of two-pound propane cylinders and camp fuel stored inside.

Outside Fire

CONNECTICUT
Dollar Loss: \$11,200,000
Month: March
Time: 10 PM

Property Characteristics and Operating Status:

This incident involved a tanker truck carrying 12,000 gallons (54 kiloliters) of fuel oil on an interstate highway

Fire Development:

The tanker truck collided with a car on an inter-

TABLE 4 LARGE-LOSS FIRE INCIDENTS OF 2004



state. The ensuing fireball caused severe damage to the highway and an overpass. The fire burned out of control for several hours causing the elevated section of highway to buckle and sag.

Contributing Factors and Other Details:
One firefighter and one civilian suffered minor injuries.

UTAH
Dollar Loss: \$10,000,000
Month: July
Time: 7:10 PM

Property Characteristics and Operating Status:
Outside storage area for rolled paper at a paper plant.

Fire Development:
This incendiary fire was set with available combustibles at the location. The area was fully involved in fire on arrival.

Contributing Factors and Other Details:
There was a sprinkler system in an exposed building that activated and assisted in keeping the fire from spreading into that structure.

Educational Properties

CALIFORNIA
Dollar Loss: \$8,572,000
Month: February
Time: 12 PM

Property Characteristics and Operating Status:
This one-story middle school was of protected ordinary construction and covered 14,400 square feet (1,337 square meters). The school was not in session that day but a teacher was in the building preparing for classes.

Fire Protection Systems:
There was partial coverage of heat detection equipment present, though not in the area of fire origin. A detector activated shortly after the fire was discovered. There was no suppression system present.

Fire Development:
The exact source of ignition of this fire could not be determined. It broke out above the ceiling of a classroom in the science wing and burned undetected through the open combustible construction of the attic and mansard roof. The fire destroyed the science wing as well as parts of two other wings.

Contributing Factors and Other Details:
No fire stops or separations in mansard or over-

hangs, and no fire rated walls allowed the fire to spread. Loss to the school was listed as \$8,072,000 and \$500,000 to the contents.

Basic Industry Properties

HAWAII
Dollar Loss: \$10,750,000
Month: January
Time: not reported

Property Characteristics and Operating Status:
Electric power plant. No other information was reported.

Fire Protection Systems, Fire Development, Contributing Factors and Other Details:
No information reported.

Public Assembly Properties

ARIZONA
Dollar Loss: \$8,000,000
Month: December
Time: 7:33 PM

Property Characteristics and Operating Status:
This two-story convention center was of protected non-combustible construction. The ground floor area was not reported. The center was fully operating at the time of the fire.

Fire Protection Systems:
There was a smoke detection system present that operated and alerted the occupants. The coverage was not reported. There was a wet-pipe sprinkler system present. The system did activate with over 30 heads flowing water.

Fire Development:
Heat from a halogen light ignited walnut dust used in filming a collapse scene in a mine for a movie. The fire ignited polyurethane beams and walls of a cave and extended to the cave roof. A covering over the movie set prevented water from the sprinkler from reaching the seat of the fire but the sprinkler flow did prevent the fire's spread beyond the set.

Contributing Factors and Other Details:
Original reports were that one worker was missing. A primary search was initiated but the worker was located unharmed. Visibility was zero as firefighters attempted an initial fire attack. Firefighters were warned initially of loose rattlesnakes at the movie set. The snakes were corralled by an animal handler and posed no threat to the firefighters.