U.S. Fire Administration

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Residential Structure Fires During the Winter Holiday Season

FINDINGS

- **The incidence and severity of fires during the winter holiday season (December through early January) increase. The greater use of decorations, candles, and Christmas trees in residential structures during this period contributes to this increase.**
- **Fires caused by children playing increase during the holiday season.**
- **When Christmas trees are the material first ignited in residential structures, dollar loss per fire is three times higher and fatalities per fire are eight times higher than fires ignited by other materials.**
- **The incidence of Christmas tree fires increases as the holiday season progresses because trees (and other plant-like decorations) dry out and become more combustible.**
- **Candle fires increase fourfold during the holiday season, killing more than 10 people, injuring 175, and causing more than $20 million in property losses.**

Source: NFPA and NFIRS

Each year, nearly 156,000 fires in the United States occur during the winter holiday season claiming nearly 630 lives, 2,600 injuries, and $936 million in property damage.[1,2] Of these, 47,000 residential structure fires kill 530, injure 2,200, and cause an estimated $554 million in property damage.

Fire loads increase throughout the home during the holiday season. Many homes are decorated with seasonal garlands, electric lights, candles, banners, or displays. Probably the most popular addition to the home during the holiday season, and a significant fire hazard, is the Christmas tree. Dried-out fir and pine Christmas trees ignite easily and can accelerate fire growth by spreading rapidly to nearby combustible materials in the home.

Loss Measures

Winter holiday fires, like winter fires in general[3], are more severe than fires on the average day. In addition, winter fires that occur during the winter holidays have slightly higher losses (1 to 2 percent) than fires that occur in the remaining winter season[4] (Figure 1).

The losses are highest for those holiday fires that occur in residential structures. Some of these of these holiday residential structure fires are particularly of concern. Such is the case where decorations, candles, and

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Christmas trees are involved in the ignition (Figure 2). The injury rates are higher and, in the case of Christmas tree fires, the dollar loss per fire is significantly higher. Winter holiday residential structure fires have three times the dollar loss per fire when Christmas trees are the first material ignited than those fires that are ignited by other materials. Fatalities per fire when a Christmas tree is the first material ignited is nearly eight times that of other winter holiday fires.

Figure 1. Loss Measures for All Fires
(3-year average, NFIRS data 1996–98)

LOSS MEASURE	AVERAGE DAY	ALL WINTER FIRES	ALL WINTER HOLIDAY FIRES
Dollar Loss/Fire	$5,619	$6,476	$7,040
Injuries/1,000 Fires	15.7	19.3	21.0
Fatalities/1,000 Fires	2.4	3.6	4.1

Source: NFIRS only

Figure 2. Loss Measures for Winter Fires in Residential Structures
(3-year average, NFIRS data 1996–98)

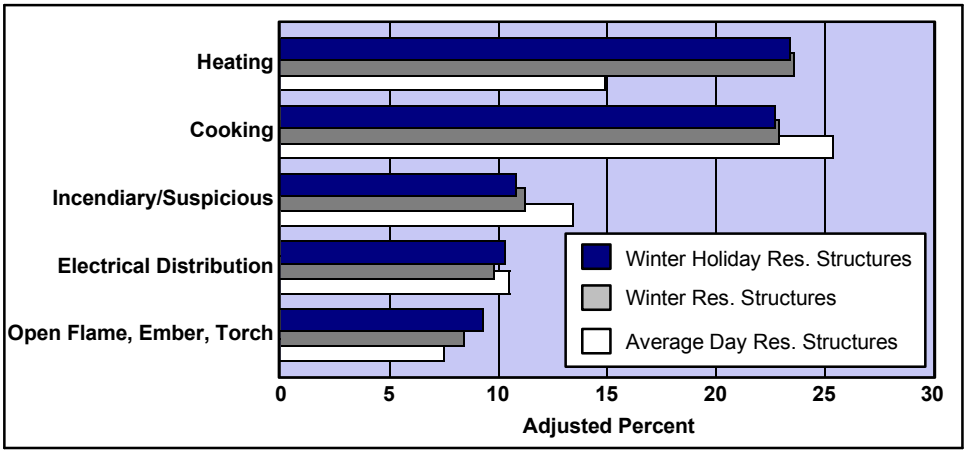
LOSS MEASURE	ALL WINTER FIRES	ALL WINTER HOLIDAY FIRES	WINTER HOLIDAY DECORATION FIRES	WINTER HOLIDAY CANDLE FIRES	WINTER HOLIDAY CHRISTMAS TREE FIRES
Dollar Loss/Fire	$11,437	$11,668	$7,827	$12,202	$30,693
Injuries/1,000 Fires	49.1	50.2	58.7	114.6	132.3
Fatalities/1,000 Fires	9.9	9.9	0	6.9	31.1

Source: NFIRS only

Causes

Cooking is the leading cause of residential structure fires year round, followed by heating and incendiary/suspicious. During the winter and winter holiday season, however, heating supplants cooking as the leading cause of residential structure fires. Winter holiday fires show a slight increase in electrical distribution and open flame fires over winter residential fires, in large part as a result of the increase in candle, Christmas tree, and decoration fires. Figure 3 compares the leading causes of residential structure fires between the winter holiday season, the winter season as a whole, and the entire year.

Figure 3. Causes of Residential Structure Fires
(3-year average, NFIRS data 1996–98)

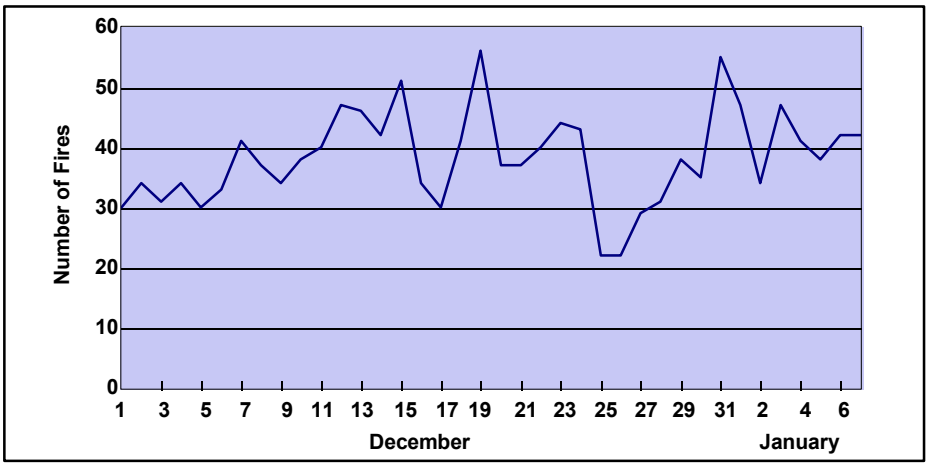


Source: NFIRS only

Children Playing With Fire

Residential structure fires caused by children playing increase during the winter holiday season. During this period, the daily number of residential structure fires caused by children playing fluctuates but remains around 40 per day (Figure 4). Fires in residential structures during the winter holiday peak on December 19 when close to 60 fires occur and then drop on the following days. Residential structure fires caused by children playing sinks to its lowest level (about 20 fires) on Christmas Day and the day following Christmas. This may be due to children being in the presence of their parents on the holiday and their preoccupation with the festivities and gifts. On New Year's day, however, there is a sharp increase in the number of residential structure fires caused by children playing. More than 100 residential structure fires caused by children playing occur over the New Year's holiday.[5] The incidence of residential structure fires caused by children playing returns to usual levels after January 7.

Figure 4. Holiday Season Residential Structure Fires Caused by Children Playing
(3-year average, NFIRS data 1996–98)



Source: NFIRS only

Decorations

Residential structure fires where the form of material ignited is a decoration tend to injure many people, although not to the degree of fires started by candles or Christmas trees. Although deaths in these fires are extremely rare, injuries soar with as many as 60 injuries per 1,000 fires. Approximately 330 residential structure fires occur each winter holiday where decorations are involved in the ignition.

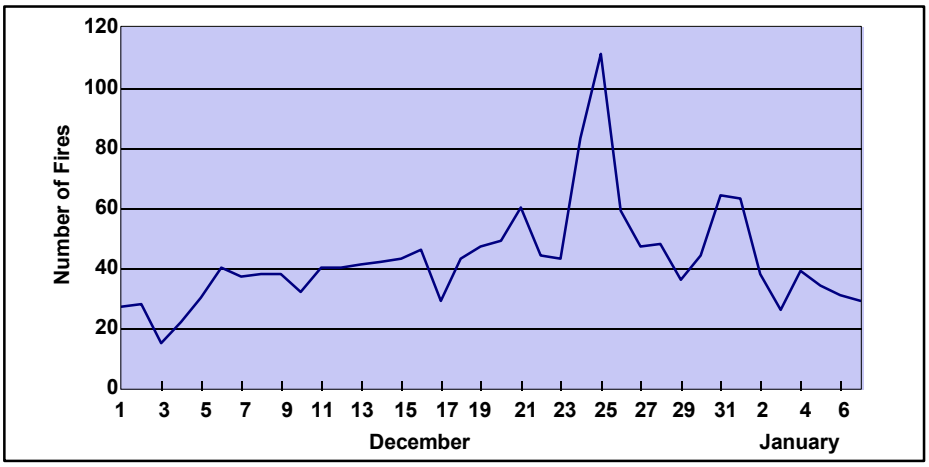
Residential structure fires where decorations are involved occur more frequently during the winter holiday season. Approximately nine residential structure fires occur per day during the winter holiday season compared two per day during the rest of the year. Homeowners should be cautious in the placement of decorations during the winter holiday season. Placing decorations too close to a heat source could be a recipe for fire.

Candle Fires

Many people decorate their homes with candles during the winter holiday season. Consequently, candle fires increase fourfold during this period. More than 1,600 residential structure fires occur each winter holiday season where candles are the form of heat of ignition. Candle fires kill more than 10 people, injure another 175, and cause more than $20 million in property damage each holiday season. For every 1,000 residential structure fires where candles are the form of heat of ignition, 7 people die and 115 people are injured. Candle fires cause an estimated $12,200 in property damage per fire.

A noticeable increase in candle fires in residential structures occurs on Christmas Day when more than 110 fires occur. Homeowners must be alert and should never leave a lit candle unattended. Figure 5 shows the daily incidence of candle fires in residential structures during the winter holiday season.

Figure 5. Holiday Season Residential Structure Fires: Candles as Material First Ignited
(3-year average, NFIRS data 1996–98)



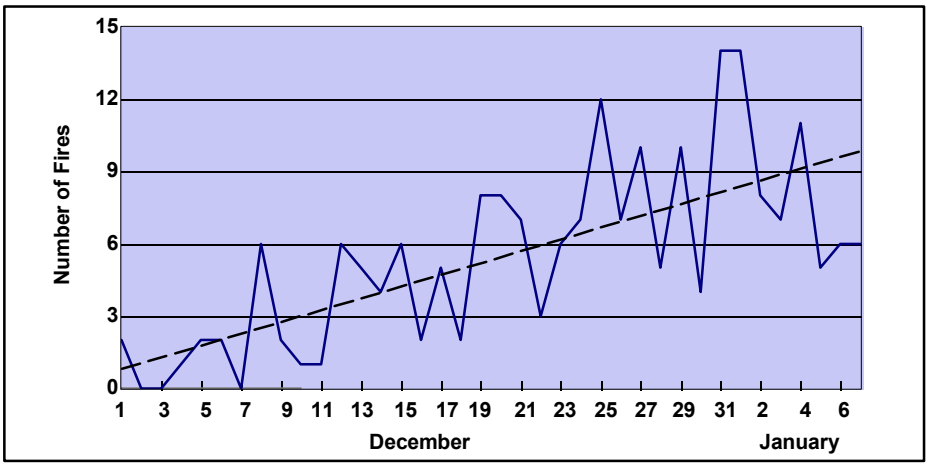
Source: NFIRS only

Christmas Trees

Many homes have Christmas trees during the winter holiday season. While few in number, Christmas tree fires lead to significant losses in residential structure fires. There are about five residential structure fires per day during the winter holiday season. The number of residential structure fires where Christmas trees are the form of material first ignited are relatively low in the beginning of the winter holiday season and increase significantly through the holiday season. Figure 6 shows the daily incidence of residential structure fires where Christmas trees are the form of material first ignited. Each year more than 200 residential structure fires occur where Christmas trees are the form of material first ignited.

As the winter holiday season progresses, live or cut Christmas trees and greens dry out. Living plants (including trees) do not burn as easily as dead ones. As plants die, they dry out and become more combustible. Some of these fires can be prevented through by shortening the time the tree is in the home and by keeping the tree watered. Using preservatives when watering the Christmas tree may also be beneficial. Ingredients for such preservatives can be obtained from your local fire department or the United States Fire Administration (http://www.usfa.fema.gov). The use of artificial Christmas trees will also lower the incidence of tree fires in residences.

Figure 6. Holiday Season Residential Structure Fires: Christmas Trees as Material First Ignited
(3-year average, NFIRS data 1996–98)



Source: NFIRS only

Examples

- December 15, 1993: Salt Lake City, Utah – Improperly spliced electrical wires ignited dry, decorative moss wrapped around the trunk of the Christmas tree in the Governor's mansion, an historical landmark. The moss acted like a wick, carrying the flames up the tree to the second floor. Firewood stacked around the base of the tree for support and decoration fed the fire on the main floor. All the people in the mansion were safe, but a state treasure was nearly lost. Restoration of the mansion cost more than $5 million.[6]

- December 16, 1999: Korona, Florida – A child playing with matches lit a mattress on fire, entrapping the five members of his family. Three family members were able to escape from the fire, but two children died of smoke inhalation.[7]

- December 23, 2000: New York City – Two children were killed and their parents critically injured by a fire that was ignited when a candle accidentally rolled under the family's Christmas tree.[8]

- December 23, 2001: Memphis, Tennessee – A family of five was trapped in a bedroom in their second-floor apartment when a fire broke out. Faulty wiring in the family's Christmas tree caused the fire that rapidly burned throughout the apartment, blocking the doorway to the bedroom where all five were sleeping. Three of the family members died as a result of the fire.[9]

Conclusion

During the winter Holiday season, the fireload inside a home increases. As a result of this increased fuel, losses from residential structure fires increase. Especially tragic are those fires caused by decorations, candles, and Christmas trees. Efforts must be made to make a fire-safe home, especially during the winter holiday season. Homeowners must be aware of the increased fire hazards present in their homes during this festive time of year.

Notes:

1. National estimates are based on data from the National Fire Incident Reporting System (NFIRS) (1996–1998) and the National Fire Protection Association's (NFPA's) annual survey, *Fire Loss in the United States.*
2. For this analysis, the winter season begins December 1 and ends January 7 of the following year.
3. See Topical Fire Research Series "Winter Residential Fires" at http://www.usfa.fema.gov/downloads/pdf/tfrs/v1i13.pdf (print) or http://www.usfa.fema.gov/downloads/pdf/tfrs/v1i13–508.pdf (accessible).
4. For this analysis, the winter season begins November 1 and ends February 29.
5. For this analysis, the New Years holiday consists of those fires occurring on December 31 and January 1.
6. Station KCPW, December 22, 2000 (http://www.slcpl.lib.ut.us/cec/archive/December22.html).
7. Haug, Jim, "Florida Fire That Killed LDS Girls Ruled Accident," *News Journal,* January 5, 2000.
8. "Candle Starts Fire Fatal to 2 Children," *New York Daily News,* December 23, 2000.
9. "Christmas Tree Believed Cause of Fire That Killed 3," *Oak Ridger Online,* December 24, 2001 (http://www.oakridger.com/stories/122401/stt1224010026.html).

To review the detailed methodology used in this analysis, click METHODOLOGY. To request additional information, or to comment on this report, visit http://www.usfa.fema.gov/feedback/