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Fire Station Fires

FINDINGS

- Fire station fires most often originate in fire departments' vehicles (44%); 37% of fires are structure fires.
- The leading cause of the approximately 150 fire station fires each year is attributed to "electrical distribution," although "cooking" is the leading cause of structure fires.
- Electrical wire is the leading material igniited, most often due to short circuits.
- Too often, fire stations have no damage insurance or are underinsured.

U.S. firefighters spend considerable time living and working in fire stations. Like residential and commercial structures everywhere, fire stations are also susceptible to the dangers of fire.

Between 1996 and 1998, an average of approximately 150 fires occur in fire stations annually.[1] Although these fires represent a minuscule number of the total fires in the United States, they still cause approximately $1.6 million in property loss, which does not include the cost of replacing or repairing damaged equipment and apparatus. Further, those fire departments affected by fire must find ways to rebuild while maintaining adequate levels of fire protection to their communities. No firefighter fatalities were reported to NFIRS between 1996 and 1998.[2]

This report examines the causes and characteristics of fire in and immediately surrounding U.S. fire stations.[3]

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Dollar loss and firefighter casualties in fire station fires are compared with losses from all non-residential structure fires in Figure 1. Structure fires on fire station properties cause more damage and are more injurious to firefighters than non-structure fires on these properties (e.g., vehicles, brush).

Figure 1. Loss Measures for Fire Station Fires

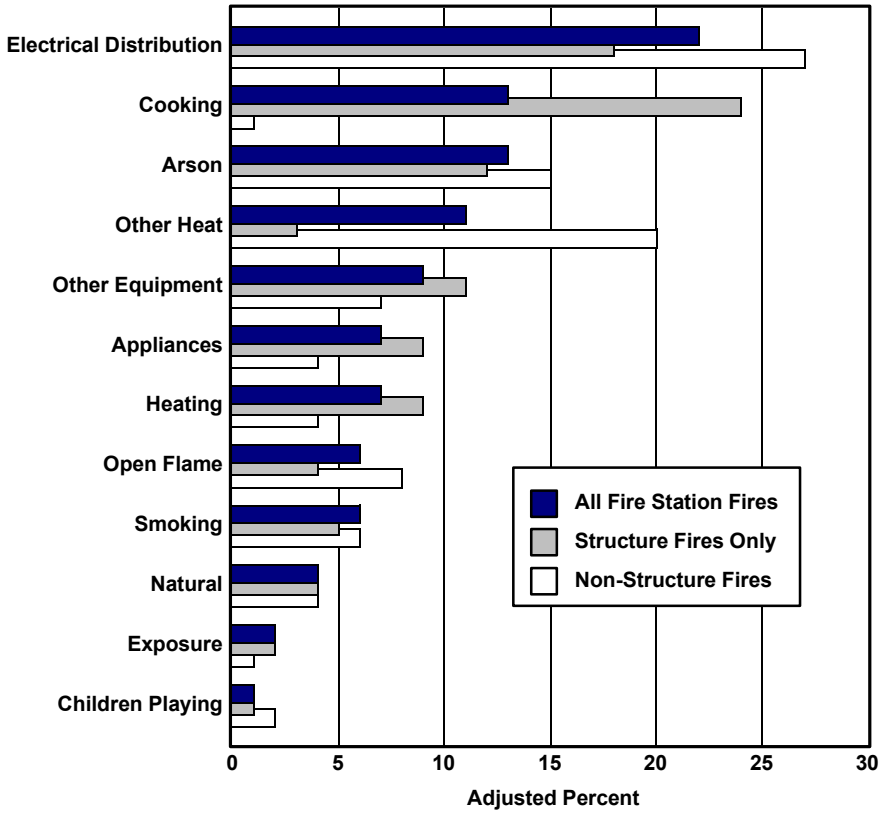
(3-year average, NFIRS data 1996–98)

MEASURE	NON-RESIDENTIAL STRUCTURE FIRES	FIRE STATION STRUCTURE FIRES	ALL OTHER FIRE STATION FIRES
Dollar Loss/Fire	$21,878	$9,863	$1,742
Firefighter Injuries/ 1,000 Fires	31.5	29.4	3.3
Firefighter Fatalities/ 1,000 Fires	0.1	0.0	0.0

As shown in Figure 2, the leading cause of fires in fire stations is cooking, followed by electrical distribution.[4, 5] (Nationally, the leading cause of fire is arson.)

Figure 2. Causes of Fire Station Fires

(3-year average, NFIRS data 1996-98)



The leading materials ignited in fire station fires are shown in Figure 3. The predominance of fires involving electrical wire is consistent with the high incidence of electrical distribution fires. The prominence of cooking materials and fuel are consistent with the occurrence of cooking and vehicle fires.

Figure 3. Form of Material Ignited

(3-year average, NFIRS data 1996–98)

STRUCTURE FIRES ONLY		NON-STRUCTURE FIRES	
Electrical Wire	26%	Electrical Wire	40%
Cooking Materials	20%	Fuel	10%
Structural Member/ Framing	7%	Trash/Rubbish	10%
Fuel	5%	Growing, Living Form	5%

Approximately 37% of fire station fires involve the station's structure (as reported by the first arriving fire department units or personnel). Nearly 44% of fire station fires are actually vehicle fires on the station's property, and 15% are refuse fires. Figure 4 shows the leading areas of fire origin for structure and non-structure fire station fires.

Figure 4. Area of Fire Origin

(3-year average, NFIRS data 1996–98)

STRUCTURE FIRES ONLY		NON-STRUCTURE FIRES	
Kitchen	29%	Engine Area of Vehicle	45%
Garage, Vehicle Storage	13%	Passenger Area of Vehicle	20%
heating Equipment Room	10%	Vehicle Trunk	7%
Laundry Room	7%	Trash Area	5%

Twenty percent of structure fires are ignited by an electrical short circuit, and 12% begin after ignition materials are left unattended (Figure 5). For non-structure fires, short circuits, part failures, and mechanical failures are the leading factors influencing fire ignition.

Figure 5. Ignition Factor

(3-year average, NFIRS data 1996-98)

STRUCTURE FIRES ONLY		NON-STRUCTURE FIRES	
Short Circuit	20%	Short Circuit	27%
Unattended	12%	Part Failure	13%
Electrical Failure	10%	Abandoned/Discarded	10%
Suspicious	7%	Electrical Failure	8%

All too often, fire departments affected by fire are either uninsured or underinsured for damage to their stations and equipment. For small volunteer departments, these losses

can be overwhelming. Even in larger departments or those with adequate insurance, fires in and around fire stations disrupt fire protection services.

EXAMPLES

- In January 2001, a suspicious fire, possibly started to cover up a burglary in the station, destroyed an East St. Louis fire station. While firefighters were busy fighting small arson blazes throughout the community, several portable televisions and an expensive camera were stolen from the fire station, which was then set ablaze.[6]

- In June 2000, a fire caused by a faulty electrical cord resulted in hundreds of thousands of dollars in damage to a fire station in Colfax City, Washington. The department saved the station's living quarters, but the station's apparatus bays were heavily damaged. Three engines and two ambulances required replacement.[7]

- In March 2000, faulty wiring nearly destroyed a West Virginia fire station. Only the exterior walls and roof trusses were salvageable. The department lost an engine in the blaze, which damaged another engine and a support vehicle.[8]

- In October 2001, a fire caused $100,000 in damage to a fire station in Pennsylvania. An engine parked in the apparatus bay was heavily damaged; a tanker parked outside the station was not damaged. Police are investigating the possibility that the fire was intentionally set to cover up a burglary.[9]

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. Since firefighter deaths are rare and because this report represents statistical estimates based on a sample of fires, it is possible that the estimates reflect no deaths during a time period where a fatal fire occurred.
3. This report addresses only those structures specifically coded in NFIRS as fire station property (FPU 888).
4. The percentages shown in this report have been adjusted to apportion the "unknowns" to the other causes.
5. Electrical distribution is a broad cause category that may not accurately reflect a fire's actual cause. In some instances, it may be cited as the cause simply because all other potential causes (e.g., arson, cooking) have been excluded.
6. Goodrich, Robert, "Fire Chief Thinks Blazes Were Set as Cover," *St. Louis Post-Dispatch*, January 23, 2001.
7. Casey, Heather and Slepicka, Lon, "Eight Fire Departments Recover After Recent Station Blazes," *Firehouse.com*, July 25, 2000.
8. Ibid.
9. "Pennsylvania Department Takes a Fire Hit,: *Firehouse.com*, October 4, 2001.

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