

Firefighter Injuries for 2004

NFPA estimates that there were more than 75,840 injuries in 2004



FIREFIGHTERS WORK IN VARIED and complex environments that increase their risk of on-the-job death and injury. A better understanding of how these fatal accidents, nonfatal injuries, and illnesses occur can help identify corrective actions, which could help minimize the inherent risks.

Each year, the NFPA studies firefighter deaths and injuries to provide national statistics on their frequency, extent, and characteristics. Earlier this year, NFPA reported 103 firefighters died on duty (See "2004 Firefighter Fatalities," *NFPA Journal*®, July/August 2005).

This report addresses 2004 firefighter injuries in the United States. The results are based on data collected during the NFPA Survey of Fire Departments for U.S. Fire Experience (2004). An earlier report measured the national fire experience in terms of the number of fires that fire departments attended and the resulting civilian deaths, civilian injuries, and property losses that occurred¹.

This year's report includes among its results:

- An estimate of the 2004 firefighter injuries;
- Estimates of injuries by type of duty;
- An estimate of exposures to infectious diseases;
- Trends in firefighter injuries and rates;
- Fireground injuries by cause;
- Fire department vehicle accidents and resulting firefighter injuries;
- The average number of fires and fireground injuries per department by population of community protected; and
- Descriptions of selected incidents that illustrate firefighter safety problems.

Overall Results

Based on survey data reported by fire departments, NFPA estimates that 75,840 firefighter injuries occurred in the line of duty in 2004.² This is a decrease of 3.7 percent and the lowest it's been since 1977 when NFPA started using its current survey methodology. However, the lower number of injuries since 1994 is due in part to additional questions on exposures, which allows us to place them in their own categories. Previously some of these exposures may have been included in total injuries under other categories.

NFPA estimates that there were 10,550 exposures to infectious diseases (e.g., hepatitis, meningitis, HIV, others) in 2004. This amounts to 0.7 exposures per 1,000 emergency medical runs by fire departments in 2004.

SUMMARY

- 75,840 firefighter injuries occurred in the line of duty in 2004, a decrease of 3.7 percent from 2003.

- 36,880 or 48.6 percent of all firefighter injuries occurred during fireground operations. An estimated 14,250 occurred during other on duty activities, while 13,150 occurred at non-fire emergency incidents.

- The major types of injuries received during fireground operations were strain, sprain, muscular pain (48.5 percent); wound, cut, bleeding, bruise (17.2 percent); burns (7.8 percent); smoke or gas inhalation (5.5 percent).

- The complete report is available at www.nfpa.org/research.

NFPA estimates that there were 18,300 exposures to hazardous conditions (e.g., asbestos, radioactive materials, chemicals, fumes, other) in 2004. This amounts to 17.9 exposures per 1,000 hazardous condition runs in 2004.

An estimated 18,200-firefighter injuries resulted in lost time in 2004.

Injuries by Type of Duty

Estimates of firefighter injuries by type of duty are displayed in Figure 2. The type of duty is divided into five categories:

- Responding to or returning from an incident (includes fire and nonfire emergencies);
- Fireground (includes structure fires, vehicle fires, brush fires, etc.), and refers to all activities from the moment of arrival at the scene to departure time (e.g., setup, extinguishment, overhaul);
- Nonfire emergency (includes rescue calls, hazardous calls, such as spills, and natural disaster calls);
- Training and

TABLE 1 - Firefighter Injuries at the Fireground and at Nonfire Emergencies, 1988-2004

Year	Injuries at the fireground	Injuries per 1,000 Fires at the fireground	Injuries at nonfire emergencies	Injuries per 1,000 Incidents at nonfire emergencies
1988	61,790	25.4	12,325	1.13
1989	58,250	27.5	12,580	1.11
1990	57,100	28.3	14,200	1.28
1991	55,830	27.3	15,065	1.20
1992	52,290	26.6	18,140	1.43
1993	52,885	27.1	16,675	1.25
1994	52,875	25.7	11,810	0.84
1995	50,640	25.8	13,500	0.94
1996	45,725	23.1	12,630	0.81
1997	40,920	22.8	14,880	0.92
1998	43,080	24.5	13,960	0.82
1999	45,500	25.0	13,565	0.76
2000	43,065	25.2	13,660	0.73
2001	41,395	23.9	14,140	0.73
2002	37,860	22.4	15,095	0.77
2003	38,045	24.0	14,550	0.70
2004	36,880	22.1	13,150	0.62

Source: NFPA Survey of Fire Departments for U.S. Fire Experience (1988-2004)

• Other on-duty activities (e.g., inspection or maintenance duties).

Results by type of duty indicate that the largest share of injuries occur during fireground operations: 36,880 or 48.6 percent of all firefighter injuries in 2004. Table 1 displays firefighter injuries at the fireground and injury rates for the 1989-2004 period. Before 1988, firefighter injuries were around 100,000 per year, with no trend up or down, since NFPA's first calculation of estimates in 1977. Injuries at the fireground decreased from their high of 61,790 in 1988 to a low of 36,880 in 2004 for a decrease of 40.3 percent. The rate of injuries per 1,000 fires has generally decreased during the period. This is because the number of fire incidents also decreased a considerable 36.4 percent for the 1988 to 2004 period.

In addition to injuries at the fireground, an estimated 14,250 or 18.8 percent occurred during other on-duty activities, while 13,150 or 17.3 percent occurred at nonfire emergencies.

Nature of Fireground Injuries

Estimates of 2004 firefighter injuries by nature of injury and type of duty are displayed in Table 2. The nature of injury cause categories are based with modifications on NFPA 901, *Uniform Coding for Fire Protection*. Table 2 indicates that the four major types of injuries that occur during fireground operations are strain, sprain (48.5 percent); wound, cut, bleeding, bruise (17.2 percent); burns (7.8 percent); smoke or gas inhalation (5.5 percent); thermal stress (5.1 percent).

Results were consistent during all non-fire-

ground activities, with strains, sprains, and muscular pain accounting for 56.4 percent of all non-fireground injuries, and wound, cut, bleeding, bruise accounting for 17.4 percent.

Causes of Fireground Injuries

Because fireground injuries are of particular concern, their causes were examined (see Figure 3). The definition of cause here refers to the initial circumstance leading to the injury. The cause categories included on the survey are based on NFPA 901. Fall, slip, jump (29.7 percent), overexertion, strain (25.7 percent) were the leading causes of fireground injuries. Other major causes were contact with object (9.0 percent); exposure to fire products (8.8 percent).

Fire Department Vehicle Collisions

NFPA reported earlier that 17 firefighters died in motor vehicle collisions in 2004. (See "2004 Firefighter Fatalities", July/August 2005, *NFPA Journal*).

In 2004, there were an estimated 15,420 collisions involving fire department emergency vehicles, where departments were responding to or returning from incidents (see Table 3). To put this number in perspective however, fire departments responded to more than 22.6 million incidents in 2004 so that the number of collisions represents about one tenth of 1 percent of total responses. However, these collisions resulted in 980 firefighter injuries or 1.2 percent of all firefighter injuries.

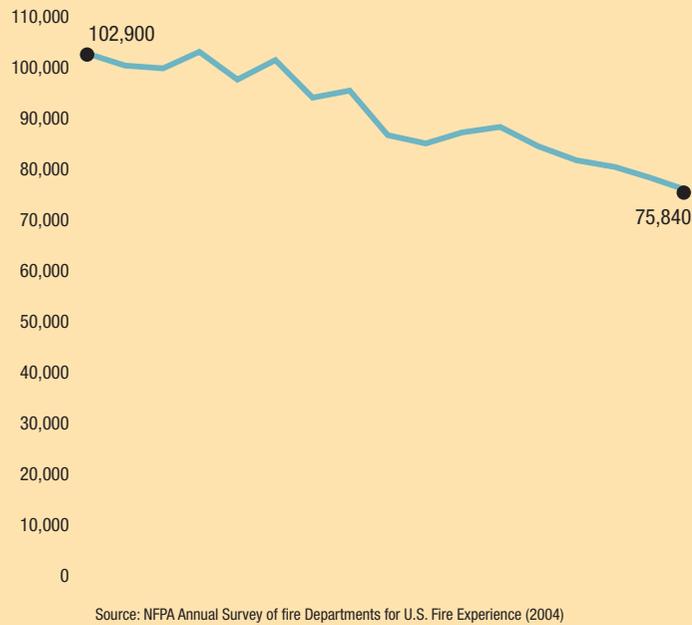
In addition, 1,150 collisions involving firefighters' personal vehicles occurred in 2004 while departments were responding to or

TABLE 2 - Firefighter Injuries by Nature of Injury and Type of Duty, 2004

Nature of Injury	Responding to or Returning from an Incident		Fireground		Nonfire Emergency		Training		Other On-Duty		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Burns (Fire or Chemical)	50	1.0	2,860	7.8	110	0.8	380	5.7	260	1.8	3,660	4.8
Smoke or Gas Inhalation	115	2.4	2,040	5.5	105	0.8	45	0.7	80	0.6	2,385	3.1
Other Respiratory Distress	100	2.1	875	2.4	200	1.5	180	2.7	125	0.9	1,480	2.0
Burns and Smoke Inhalation	5	0.1	585	1.6	15	0.1	25	0.4	25	0.2	655	0.9
Wound, Cut, Bleeding Bruise	910	18.8	6,325	17.2	2,010	15.3	1,035	15.4	2,840	19.9	13,120	17.3
Dislocation, Fracture	230	4.8	1,045	2.8	275	2.1	245	3.7	375	2.6	2,170	2.9
Heart Attack or Stroke	80	1.7	290	0.8	125	1.0	50	0.7	325	2.3	870	1.2
Strain, Sprain Muscular Pain	2,955	61.0	17,890	48.5	7,735	58.8	3,840	57.1	7,460	52.4	39,980	52.6
Thermal Stress (frostbite, heat exhaustion)	35	0.7	1,875	5.1	175	1.3	345	5.1	80	0.6	2,510	3.3
Other	360	7.4	3,095	8.4	2,400	18.3	575	8.6	2,680	18.8	9,110	12.0
	4,840		36,880		13,150		6,720		14,250		75,840	

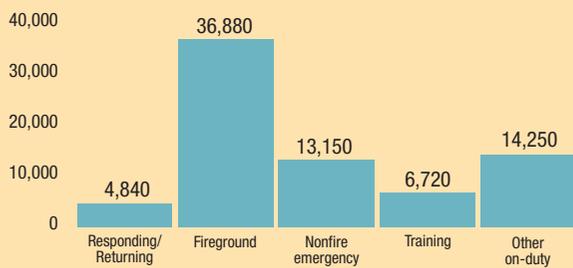
Source: NFPA Survey of Fire Departments for U.S. Fire Experience, 2004
 Note: If a firefighter sustained multiple injuries for the same incident, only the nature of the single most serious injury was tabulated.

FIGURE 1 - Total Firefighter Injuries by Year (1988-2004)



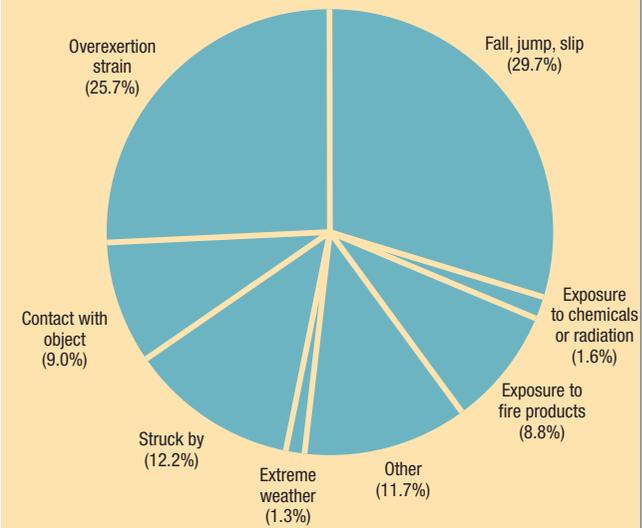
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004

FIGURE 2 - Total Firefighter Injuries by Type of Duty, 2004



Source: NFPA Annual Survey of fire Departments for U.S. Fire Experience (2004)

FIGURE 3 - Fireground Injuries by Cause, 2004



returning from incidents. These collisions resulted in an estimated 220 injuries.

Average Fires and Fireground Injuries per Department by Population Protected

The average number of fires and fireground injuries per department by population of community protected in 2004 are displayed in Table 4. These tabulations show (1) that the number of fires a fire department responds to is directly related to the population protected, and (2) that the number of fireground injuries incurred by a department is directly related to its exposure to fire, i.e., and the number of fires attended by the department. The second point is clearly demonstrated when we examine the range of the

PHOTOGRAPH: AP PHOTO/THE DAILY TIMES, TOM SHERLIN

TABLE 3 - Fire Department Vehicle Collisions and Resulting Firefighter Injuries While Responding to or Returning from Incidents, 1990-2004

Year	Collisions Involving Fire Department Emergency Vehicles	Firefighter Injuries Involving Fire Department Emergency Vehicles	Collisions Involving Firefighters' Personal Vehicles	Firefighter Injuries Involving Firefighters' Personal Vehicles
1990	11,325	1,300	950	175
1991	12,125	1,075	1,375	125
1992	11,500	1,050	1,575	150
1993	12,250	900	1,675	200
1994	13,755	1,035	1,610	285
1995	14,670	950	1,690	190
1996	14,200	910	1,400	240
1997	14,950	1,350	1,300	180
1998	14,650	1,050	1,350	315
1999	15,450	875	1,080	90
2000	15,300	990	1,160	170
2001	14,900	960	1,325	140
2002	15,550	1,040	1,030	210
2003	15,900	850	980	85
2004	15,420	980	1,150	220

Source: NFPA Survey of Fire Departments for U.S. Fire Experience (1990-2004)

TABLE 4 - Average Number of Fires, Fireground Injuries and Injuries Rates by Population of Community Protected, 2004

Population of Community Protected	Average Number of Fires	Average Number of Fireground Injuries	Number of Fireground Injuries per 100 Fires	Number of Fireground Injuries per 100 Firefighters
500,000 to 999,999	2,998.9	86.0	2.9	6.8
250,000 to 499,999	1,358.8	67.6	5.0	12.4
100,000 to 249,999	655.6	11.7	1.8	4.9
50,000 to 99,999	277.9	6.4	2.3	5.6
25,000 to 49,999	139.8	2.4	1.7	3.9
10,000 to 24,999	73.0	1.2	1.6	2.8
5,000 to 9,999	40.5	0.7	1.7	2.0
2,500 to 4,999	26.6	0.4	1.5	1.3
Under 2,500	12.2	0.2	1.6	0.9

Source: NFPA Survey of Fire Departments for U.S. Fire Experience (1990-2004)

statistic: from a high of 86.0 for departments that protect communities of 500,000 to 999,999 to a low of 0.2 for departments that protect communities of less than 2,500.

A useful way to look at firefighter injury experience and to obtain a reading on the relative risk that departments face is to examine the number of fireground injuries that occur for every 100 fires attended. This takes into account relative fire experience and allows more direct comparison between departments protecting communities of different sizes. The number of fireground injuries per 100 fires is displayed in column 4 of Table 4.

The overall range of rates varied little from a high of 5.0 for departments that protect communities 250,000 to 499,999 to a low of 1.5 for departments that protect communities of 2,500 to 4,999 population. Thus, the wide range noted in average fireground injuries by population protected narrows when relative fire experience is taken into account. The overall injury rate for departments protecting communities of 50,000 population or more was 2.6 injuries per 100 fires or 70 percent

higher than the injury rate for departments protecting communities of less than 50,000 population.

The risk of fireground injury per 100 firefighters by size of community protected was also calculated and is displayed in column 5 of Table 4. Larger departments generally had the highest rates with departments protecting communities of 250,000 to 499,999 having the highest rate with 12.4 injuries per 100 firefighters. As community size decreases, the rate drops quite steadily to a low of 0.9 for departments protecting less than 2,500 people. That is a more than a thirteen-to-one difference in risk of injury between communities of 250,000 to 499,999, and the smallest communities (less than 2,500).

Although a department protecting a community with a population of 250,000 to 499,999 has, on average, more than 23 times as many firefighters than a department protecting a population of less than 2,500, the larger department attends more than 110 times as many fires, and as a result, it incurs considerably more fireground injuries.

TABLE 5 - Average Number of Fires and Fireground Injuries per Department and Injuries per 100 Fires by Population of Community Protected and Region, 2004

Column 1: Average Reported Number of Fires Column 2: Average Reported Number of Fireground Injuries Column 3: Number of Fireground Injuries per 100 Fires

Population of Community Protected	Northeast			North Central			South			West		
	1	2	3	1	2	3	1	2	3	1	2	3
500,000 to 999,999	*	*	*	*	*	*	3,434.0	53.7	1.6	2,684.2	49.8	1.9
250,000 to 499,999	*	*	*	2,037.3	86.7	4.3	1,360.8	26.2	1.9	797.0	26.6	3.3
100,000 to 249,999	738.0	27.2	3.7	744.7	17.3	2.3	760.4	7.3	1.0	452.6	10.1	2.2
50,000 to 99,999	361.1	16.6	4.6	241.5	6.0	2.5	321.1	5.4	1.7	211.1	3.0	1.4
25,999 to 49,999	118.0	4.2	3.6	109.1	2.8	2.6	169.1	1.7	1.0	147.4	1.5	1.0
10,000 to 24,999	61.9	1.5	2.4	60.5	1.4	2.3	97.0	0.8	0.8	72.9	1.1	1.5
5,000 to 9,999	31.2	0.8	2.6	35.0	0.7	2.0	53.2	0.6	1.1	52.3	0.5	1.0
2,500 to 4,999	20.9	0.5	2.4	22.2	0.3	1.4	35.5	0.3	0.8	30.3	0.4	1.3
Under 2,500	11.4	0.2	1.8	9.6	0.2	2.1	18.4	0.2	1.0	12.6	0.2	1.6
Overall Regional Rate	4.2			2.5			1.3			1.7		

Source: NFPA Survey of Fire Departments for U.S. Fire Experience, 2004
*Insufficient data

Average Fires and Fireground Injuries by Population Protected and Region

Table 5 displays the average number of fires and fireground injuries per department by population of community protected and region of the country³. As in the nationwide results in Table 4, the results of each region of the country indicate that the number of fires a fire department responds to is directly related to the population protected, and the number of fireground injuries incurred by a department is directly related to the number of fires attended. The Northeast reported a substantially higher number of fireground injuries for most community sizes where all departments reported sufficient data by region.

Improving Firefighter Safety

As the statistics in this report and previous reports attest, fire fighting presents great risks of personal injury to firefighters. Moreover, it is unlikely that all firefighter injuries can be eliminated because of the kind of work performed and the hazards of the incident scene environment. A risk management system and the application of existing technology, however, can reduce present injury levels and bring about corresponding reductions in lost time, and medical costs. The following are some examples of proactive actions taken at the local level that can reduce injury rates:

- Commitment on the part of top fire service management to reducing injuries
- Establishment of a safety committee headed by a safety officer to recommend a safety policy and the means of implementing it. The policy should include a thorough inves-

tigation of all time loss injuries

- Provision of appropriate protective equipment and a mandate to use it
- Development and enforcement of a program on the use and maintenance of SCBA
- Development and enforcement of policies on safe practices for drivers and passengers of fire apparatus
- Development of procedures to ensure response of sufficient personnel for both fire fighting and overhaul duties
- Implementation of regular medical examinations and a physical fitness program
- Adoption and implementation of an incident management system
- Training and education for all members related to emergency operations
- Implementation of programs for the installation of private fire protection systems, so that fires are discovered at an earlier stage, exposing the firefighter to a less hostile environment
- Increased efforts in the area of fire safety education programs, so that citizens are made aware of measures to prevent fires and of correct reactions to the fire situation

Efforts need to be made to recognize that firefighter injuries can be reduced. By addressing the priorities listed, fire service organizations can make significant strides towards reducing the number and impact of such injuries.

Every fire service organization needs to make a commitment to reduce firefighter injuries. Practically all of the priorities listed are components of NFPA 1500, *Fire Department Occupational Safety and Health Program*, which provides a framework for a safety and health

program. It is a good place to begin when developing programs for the reduction of firefighter injuries.

Definition of Terms

Fire: Any instance of uncontrolled burning. Excludes combustion explosions and fires out on arrival (whether authorized or not), over-pressure rupture without combustion; mutual aid responses, smoke scares, and hazardous materials responses, e.g., flammable gas, liquid, or chemical spills without fire.

Incident: The movement of a piece of fire service apparatus or equipment in response to an alarm.

Injury: Physical damage suffered by a person that requires (or should require) treatment by a practitioner of medicine (physician, nurse, paramedic, EMT) within one year of the incident (regardless of whether treatment was actually received), or that results in at least one day of restricted activity immediately following the incident.

Description of NFPA Survey and Data Collection Method

NFPA annually surveys a sample of departments in the United States to make national projections of the fire problem. The sample is stratified by the size of the community protected by the fire department. All U.S. fire departments that protect communities of 100,000 or more are included in the sample, because they constitute a small number of departments with a large share of the total population protected. For departments that protect less than 100,000 population, stratifying the sample by community size permits greater precision in the estimates. Survey returns in recent years have ranged from 2,700 to 3,500 departments annually. The national projections are made by weighting sample results according to the proportion of total U.S. population accounted for by communities of each size.

The results in this report are based on injuries that occurred during incidents attended by public fire departments. No adjustments were made for injuries that occurred during fires attended solely by private fire brigades, e.g., industrial or military installations.

A form that was sent to departments requesting information enhanced data collection for the selected incident summaries. The form included questions on type of protective equipment worn, age and rank of firefighters

injured, and description of circumstances that led to injury. 🔥

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Endnotes

1. Michael J. Karter, Jr., "2004 Fire Loss in the United States," NFPA Journal, Vol. 99, No. 5 (September/October 2005).
2. Around any estimate based on a sample survey, there is a confidence interval that measures the statistical certainty (or uncertainty) of the estimate. Based on data reported by fire departments responding to the NFPA Survey for U.S. Fire Experience (2003), the NFPA is very confident that the actual number of firefighter injuries falls within the range of 66,840 to 87,840.
3. The four regions as defined by the U.S. Census Bureau include the following 50 states and the District of Columbia:
 Northeast: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.
 North Central: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.
 South: Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.
 West: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

Acknowledgments

The NFPA thanks the many fire departments that responded to the NFPA Survey for U.S. Fire Experience (2004) for their continuing efforts in providing in a timely manner the data so necessary to make national projections of firefighter injuries.

The authors gratefully thank the many NFPA staff members who worked on this year's survey, including Frank Deely, John Baldi, and John Conlon for editing and keying the survey forms and their follow-up calls to fire departments; and Norma Candeloro for handling the processing of survey forms and typing this report.



FIREFIGHTER INJURIES OF 2004

Firefighter Struck by Vehicle

A firefighter was struck by a vehicle and thrown nearly 80 feet (24 meters) while extinguishing a vehicle fire. A second vehicle drove through a traffic control perimeter, consisting of traffic cones and the company officer directing traffic. The company officer yelled to the two firefighters extinguishing the fire but neither heard his warnings. The vehicle struck one of the firefighters and fled the scene. The firefighter was hospitalized for 33 days in serious condition suffering from multiple traumatic injuries.

A fire department investigation cited several factors that contributed to the severity of the firefighter's injuries. The primary factor was apparatus placement. The truck did not properly block oncoming traffic, leaving the work area vulnerable to the flow of traffic. Another factor was the victim's decreased awareness while wearing full-protective clothing. The firefighter did not hear the officer's warnings because wearing SCBA reduced his peripheral vision, hearing, and sight. Other factors included lack of a lookout in communication with the suppression team, time of day (0200 hours), and a communications delay when using "emergency traffic" over the radio, which delayed the proper dispatch of appropriate resources for several minutes.

After three surgeries and 11 months of rehabilitation, the injured firefighter is now on restricted duty and expected to return to full duty.

Emergency Medical Incident

A fire department dispatched two firefighters to assist a person suffering from a seizure on a busy four-lane thoroughfare. The unit arrived on scene and located their patient on the opposite side of the road. The paramedic, who was not wearing any protective clothing, exited the truck and began crossing the busy road. An approaching vehicle sped up, in an attempt avoid traffic, drove around the stopped vehicles, and struck the firefighter. The vehicle was traveling approximately 30 miles (48 kilometers) per hour. The 34-year-old firefighter/paramedic broke his right leg in several places and has been out of work for nine months.

Training

A 41-year-old male firefighter recruit collapsed during training. He was participating in a search and rescue evolution at the fire department's training facility. Immediately after he collapsed, two instructors removed the blindfolded trainee from the

darkened building and transferred care to two onsite paramedics.

The recruit suffered from heat exhaustion and dehydration and was diagnosed with rhabdomyolysis. He has not returned to the fire academy as of this time and has not been medically cleared to perform firefighting duties. His future with the department is undetermined at this time

Fire Suppression

A 38-year-old firefighter was severely injured during an explosion at a pet food manufacturing company. The fire department was called to investigate a small amount of smoke coming from a storage bin containing a fine cellulose material. Investigators believe that some embers from a small fire in a conveyor belt bearing the previous day had ignited product in the bin. The fire department supervised the removal process while company employees slowly began to remove product from the bin using a mixer affixed to the bin. After several hours of removing the material, workers saw some charred but cool material exiting from the mixer. The work continued until the bin was empty. The only remaining material was in the mixer as crews slowly removed remnants.

After several hours of operations, the fire department began terminating the incident. The firefighter then went on a catwalk 20 feet (6 meters) directly above the mixer to retrieve some equipment when a violent explosion occurred. The firefighter was sent flying where he landed on another catwalk nearly 50 feet (15 meters) above the mixer. After being located by fellow firefighters, he was removed from the building and transported to the hospital in an advanced life support unit.

The victim was not wearing a full protective ensemble at the time of injury, primarily because he was not in an IDLH (immediately dangerous to life and health) atmosphere and was picking up tools and hose. He was only wearing his coat, bunker pants, gloves, and boots. He was hospitalized for 21 days with multiple compound fractures in his legs. He has not returned to full duty after 11 months of rehabilitation. He experienced several infections and complications during surgery, prolonging his recovery.

Fire Suppression

A company officer was injured while operating at an electrical fire on the first story of a two-family dwelling quickly spread throughout the balloon-frame structure. The injured officer was backing down after

FIREFIGHTER INJURIES OF 2004



searching for fire victims in the attic area that was converted to a bedroom. As he turned to exit, the floor collapsed and he became lodged between the structural members, flooring and ceiling materials.

A dedicated rapid intervention crew of six firefighters removed the company officer from the structure. He was burned over 15 percent of his body, with 10 percent of those burns being third degree. He was wearing a full protective ensemble with a fully integrated PASS device that activated automatically. He returned to work eight months after the incident.

Several other firefighters suffered injuries ranging from heat exhaustion, to minor burns, and a shoulder sprain. The department specifically credits the proper use of protective fire hoods and earflaps on helmets in preventing burns that could have been more serious to all members. The other injured members all returned to work within three weeks.

Fire Suppression

A 20-year veteran company officer received extensive injuries after being struck in the head by a falling object. The object, believed to be some ductwork, fell on the captain while he was performing overhaul of a ceiling. The object struck him in the back of the helmet, which drove his head forward. Two firefighters in the area heard the object fall and turned to find the captain kneeling holding his head. The injured officer was dazed and confused and having difficulty moving and breathing. The firefighters laid him on a countertop, removed his hood, and opened his coat. Two other firefighters arrived and the four removed the injured captain from the structure.

The 50-year-old suffered a neck injury, pulmonary embolism, and cardiomyopathy. He was hospitalized for several days and has retired from the fire service.

Fire Suppression

Four firefighters were injured while battling a fire in a single-family dwelling. The fire originated in the basement near the furnace. The fire spread throughout the wooden balloon frame construction, breaking out onto the second story where three firefighters were searching for fire. The intense heat forced the three to retreat.

The stairwell leading down to the first story collapsed. One firefighter decided to jump from the second story landing to the first story landing and sprained his ankle. He was wearing his protective

ensemble properly and returned to work after being treated at the hospital.

Two firefighters exhausted their air supply while searching for a way out of the building. They found a window and exited onto a ground ladder. The first firefighter climbed down the ladder to the ground. He returned to full duty after being treated and released from the hospital. The second firefighter climbed out of the window and stepped onto the rung of the same ground ladder. He missed the rung and fell two stories, landing on his back. Because he was wearing a full protective ensemble, he did not receive any burns but he did land on his self-contained breathing apparatus, causing severe injuries to his back and spine.

At this time, he is undergoing rehabilitation and does not have any sensation from the waist down.

A fourth member suffered smoke inhalation while rescuing a firefighter from a second story window. He was on the tip of aerial ladder trying to pull and assist the victim when he inhaled a large quantity of smoke. He missed several days of work. The firefighters he helped from the window did not suffer any injuries.

Cardiac

Firefighters responded to a reported "odor of something burning" at a single-family dwelling. After a thorough investigation, the origin was located and an overheated blower motor in the furnace was identified as the cause. A half an hour after the incident, while finishing the incident report, the chief suddenly began to feel some discomfort in his chest. His firefighters transported him to the hospital where he was diagnosed with blockage of three coronary arteries causing a myocardial infarction.

After surgery to implant three stents, the 51-year-old chief was hospitalized for three days and medically cleared to resume activities as fire chief a week later.

Apparatus Incident

A 35-year-old company officer received a severe foot injury at a structure fire. The officer dismounted the apparatus and was donning his self contained breathing apparatus when the driver of the truck tried to reposition the aerial apparatus, running over and crushing his officer's right foot.

He suffered an extreme injury to his right foot and has not returned to fire duty a year and a half after the incident.