Fire Protection

By Richard C. Schulte, Schulte & Associates, Evanston, IL

Fire Safety Statistics and Building Code Change Proposals — Part 1

Lately, some interesting statistics have appeared on the National Fire Protection Association (NFPA) Web site, *www.nfpa.org*. One set of statistics summarizes fire department activities in the United States for the last 21 years (1980-2000), while another set of statistics summarizes NFPA's estimate of the number of fire fatalities, fire injuries and property losses in the United States for the last 24 years (1977-2000). A third set of statistics addresses the "fire problem" in high rise buildings.

An excerpt of the statistics on fire department activities is as follows:

Fire Department Responses

	1980	2000
Total Responses	10,819,000	20,520,000
Fire Responses	2,988,000	1,708,000
False Alarms	896,500	2,126,500
Medical Responses	5,045,000	12,251,000

The complete set of statistics provided by the NFPA shows a consistent increase in the total number of fire department responses each year between 1980 and 2000. These same statistics also show a consistent decrease in the number of responses to actual fires each year and consistent increases in the number of responses to false alarms and to medical emergencies each year.

While the total number of fire department responses almost doubled between 1980 and 2000, the number of responses to real fires actually decreased. In that same time, the population of the United States has increased by nearly 25 percent, from 226 million in 1980 to 281 million in 2000, which makes the reduction in the number of responses to actual fires far more dramatic than is indicated simply by reviewing the raw statistics. During this same period, the number of fire department responses for medical emergencies and false alarms has more than doubled. Interesting tidbits of information.

The second set of statistics which are of interest are NFPA's statistics on fire fatalities, fire injuries and property damage due to fire. The following are excerpted from these statistics.

Fatalities and Injuries

	Civilian Fatalities	Civilian Injuries	Firefighter Fatalities	Firefighter Injuries
1977	7,395	31,190	157	112,540
1980	6,505	30,200	138	98,070
1985	6,185	28,425	128	100,900
1990	5,195	28,600	107	100,300
1995	4,585	25,775	97	94,500
2000	4,045	22,350	102	-----

Property Damage

1977	$4.709 Billion
1980	$6.254 Billion
1985	$7.324 Billion
1990	$7.818 Billion
1995	$8.919 Billion
2000	$11.207 Billion

It should be noted that the property damage estimates indicated above only include direct losses. Losses due to business interruption are not included in these estimates. It should further be noted that the NFPA estimates for property damage have not been adjusted to take into account the effects of inflation.

The complete statistics published by the NFPA indicate that the number of civilian fire deaths ranged from a high of 7,710 in 1978 to a low of 3,570 in 1999. The complete statistics also indicate that the number of firefighter fatalities ranged from a high of 172 in 1978 to a low of 75 in 1992. While the statistics indicate that the numbers of deaths and injuries fluctuate from year to year, these statistics clearly indicate the overall trend for fatalities and injuries for both civilians and firefighters in the last 24 years is down, even though the population of the United States has increased.

The excerpt of the property loss statistics clearly shows an upward trend in the amount of property damage caused by fire. Also, note that, because there are fewer fires, the loss per fire is higher in more recent years than in earlier years. Before making too much of this upward trend in property damage, it should be noted that the property loss statistics have not been adjusted for inflation. Further, it

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should also be noted that the United States is a wealthier nation now than it was in 1977. Given that, one would expect that fires would cause more damage in the year 2000 than in 1977 simply because the value of the contents of buildings has risen. To put it in simpler terms, we've got more "stuff" now than we had 24 years ago. Hence, it shouldn't be a surprise that the value of property destroyed by a fire should be greater now than 24 years ago.

The statistics on fire in high rise buildings are contained in a paper titled "High Rise Building Fires," written by John R. Hall, Jr., of the Fire Analysis and Research Division of the NFPA. The paper is dated September, 2001.

The following is an excerpt of some of the statistics contained in this paper:

Fire Fatalities in U.S. High Rise Buildings (1985-1998)

	Office Buildings	Hotels	Apartment Buildings	Total
1985	1	0	54	55
1986	1	0	32	33
1987	4	5	46	55
1988	0	8	83	91
1989	0	5	97	102
1990	0	7	76	83
1991	0	0	23	23
1992	1	0	31	32
1993	0	0	43	43
1994	0	0	51	51
1995	0	0	53	53
1996	0	8	56	64
1997	0	6	27	33
1998	0	0	35	35
Total:	**7**	**39**	**707**	**753**

The above statistics indicate that, on average, roughly 54 Americans have died each year between the years 1985 and 1998 as a result of fires in high rise buildings in the United States. (It should be noted that the above limits the term "high rise building" to tall buildings which are utilized as office buildings, hotels and apartments. The NFPA statistics also include data on high rise health care buildings.) To put this number in better perspective, approximately 75 Americans die each year as a result of being struck by lightning. Also, on average, more than 100 traffic fatalities occur each day in the United States. Using the statistics on traffic fatalities as a frame of reference, it can be stated without equivocation that occupants of high rise buildings are far safer from the threat of death by fire than when those occupants are traveling in their automobiles (even though the fire protection in many of our older high rise buildings would be considered to be "sub-standard" based upon today's fire safety standards for high rise buildings.)

Fewer fires, fewer civilian fire deaths and fire injuries and fewer firefighter deaths and injuries — most would agree that we've made considerable progress against the hazard of fire in the United States in the last 25 years. However, as evidenced by some of the fire-related code changes recently proposed to the *International Building Code*, not everyone is in agreement. Part 2 of this column will take a look at some of those proposed code changes.

But before we get to that, several more fire safety statistics should be discussed. One statistic is that typically more than 60 percent of the fire fatalities which occur in the United States occur in one- and two-family dwellings. Another statistic is that typically more than 80 percent of the fire fatalities which occur in the United States occur in residential occupancies. A third statistic is that the NFPA estimates that only 90 Americans lost their lives in fires which occurred in commercial (non-residential) occupancies in the year 2000. This last statistic might just be an anomaly. However, based upon the NFPA estimates for recent years, it can be stated with assurance that typically 200 or fewer Americans die as a result of fires in commercial buildings each year. In the last few years, the number of Americans who have died in commercial building fires has dwindled to between 120 and 140.

Now, I know what you're thinking — these statistics are all well and good, but these statistics do not include the fire fatalities from September 11, 2001. Not to belittle the events of September 11, the fatalities which occurred at the World Trade Center buildings and the Pentagon were due to an "act of war" which just happened to involve building fires. Including the fatalities which occurred at the World Trade Center site and at the Pentagon in the fire fatality statistics would be the same as including war casualties in statistics on gun violence. In other words, the casualties of the September 11 terrorist attacks on the United States don't belong in the fire casualty statistics.

Part 2 of this column will utilize some of the statistics quoted to critique some of the more interesting code change proposals included in this code change cycle for the *International Building Code*. □

Richard Schulte writes the monthly fire protection column for Plumbing Engineer. He can be contacted by sending email to rschulte@plumbingengineer.com.