

## A PERSPECTIVE ON FIRE FIGHTER FATALITY STATISTICS-2009

By Richard Schulte

The National Fire Protection Association (NFPA) recently released its annual report on fire fighter fatalities. The report titled "**Firefighter Fatalities in the United States–2009**" authored by Rita Fahy, Paul LeBlanc and Joseph Molis and dated June 2010 include the following excerpts:

*"In 2009, a total of 82 on-duty firefighter deaths occurred in the U.S. This is a sharp drop from the 105 on-duty deaths that occurred in the U.S. in 2008, and the lowest annual total since 79 deaths in 1993. The average number of deaths annually over the past 10 years is 98."*

*"In 2009, a total of 82 on-duty firefighter deaths occurred in the U.S. . . . The average number of deaths annually over the past 10 years is 98."*

*"Of the 82 firefighters who died while on duty in 2009, 41 were volunteer firefighters, 31 were career firefighters, four were employees of federal land management agencies, four were contractors with federal land management agencies, one was an employee of a state land management agency, and one was a member of a race track fire safety crew."*

*"Of the 82 firefighters who died while on duty in 2009, 41 were volunteer firefighters, 31 were career firefighters . . ."*

*"The term on-duty refers to being at the scene of an alarm, whether a fire or non-fire incident; while responding to or returning from an alarm; while participating in other fire department duties such as training, maintenance, public education, inspection, investigation, court testimony or fund raising; and being on call or stand-by for assignment at a location other than at the firefighter's home or place of business."*

*“The largest share of deaths occurred while firefighters were operating on the fire ground (27 deaths). This total is well below the average 34 deaths per year on the fire ground over the past 10 years, and half the average number of deaths in the first 10 years of this study (69 deaths per year from 1977 through 1986). Eighteen of the 27 deaths occurred at 15 structure fires. . . The average number of career firefighter deaths on the fire ground over the past 10 years is 12 deaths per year, while the average for volunteer firefighters is 16 deaths per year.”*

*“Twenty firefighters died while responding to or returning from emergency calls.”*

*“Eleven deaths occurred during training activities.”*

*“Ten firefighters died at non-fire emergencies. . .”*

*“The remaining 14 firefighters died while involved in a variety of non-emergency-related on-duty activities. These activities included normal administrative or station duties (nine deaths), community events (two deaths), patrolling for downed trees (one death), fuel reduction in a wildland area (one death) and a marijuana eradication project (one death).”*

***“The average number of career firefighter deaths on the fire ground over the past 10 years is 12 deaths per year, while the average for volunteer firefighters is 16 deaths per year.”***

*“Deaths resulting from overexertion, stress and related medical issues made up the largest category of fatalities. Of the 44 deaths in this category, 35 were classified as sudden cardiac deaths (usually heart attacks), five were due to strokes, one due to complications from hypothermia, one to an aneurysm and one from a blood clot.”*

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*“Overall, sudden cardiac death is the number one cause of on-duty firefighter fatalities in the U.S. and almost always accounts for the largest share of deaths in any given year. . . The number of deaths in this category has fallen significantly since the early years of this study. From 1977 through 1986, an average of 60 on-duty firefighters a year suffered sudden cardiac deaths. The average fell to 44 a year in the 1990s and to under 40 in the past decade. In spite of this reduction, sudden cardiac death still accounted for 39 percent of the on-duty deaths in the last five years, and 42 percent in 2009 alone.”*

*“For 19 of the 35 victims of sudden cardiac events in 2009, post mortem medical documentation showed that eight had severe arteriosclerotic heart disease, five were hypertensive, two were diabetic, and eight were reported to have had prior heart problems -- such as prior heart attacks, bypass surgery or angioplasty/stent placement. . . Other risk factors were represented among the victims of sudden cardiac death, including obesity, smoking and family history. Medical documentation was not available for the other 16 firefighters.”*

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*“Of the approximately 1,650 firefighters tested at four shows, 47.5 percent were determined to have a high overall coronary risk rating, based on the National Institute of Health’s “National Cholesterol Education Program.””*

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*“Blood pressure screenings found that 27.9 percent of the tested firefighters had high blood pressure; and 49.6 percent were prehypertensive. The remaining 22.5 percent had desired or ideal blood pressure readings.”*

*“Body fat was measured again in 2008, and 41.5 percent of the tested firefighters were found to be at high risk and another 25.1 were found to be overweight.”*

*“The firefighters who died in 2009 ranged in age from 18 to 78, with a median age of 47 years. Three were over age 70.”*

*“Firefighters aged 50 and over accounted for two-fifths of all firefighter deaths over the five-year period, although they represent only one-fifth of all career and volunteer firefighters in the U.S.”*

*“Of the 27 fire ground fatalities, 11 were due to sudden cardiac death, seven to internal trauma, five to asphyxiation, two to burns and one each to stroke and aneurysm.”*

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*“. . .None of the structures had an automatic fire suppression system.”*

*“Nine of the 17 firefighter deaths at structure fires occurred in residential properties. Fires in one- and two-family dwellings killed seven of the nine and two died in fires in apartment buildings. Four firefighters were killed in fires in vacant houses. Two firefighters were killed in a fire in a delicatessen, one died at a restaurant fire and one was killed at a fire involving a grain silo. . .None of the structures had an automatic fire suppression system.”*

*“In 2009, 14 firefighters died in 11 vehicle crashes (including five firefighters killed in three aircraft crashes). In addition to those deaths, four other firefighters were struck and killed by vehicles and two fell from moving apparatus.”*

*“With the exception of 2007, when nine career firefighters were killed in a single incident, the number of on-duty deaths of career firefighters annually continues its plateau of approximately 30 deaths each year. (There were 31 in 2009.)”*

*“Of the nine deaths in road vehicles mentioned above, six of the victims were not wearing seatbelts (four were ejected and two were not ejected), one was wearing his seatbelt, and no information on seatbelt use was available for two of the victims (neither of whom was ejected). Excessive speed was a factor in at least two of the eight crashes. Other factors reported were driver inexperience, driver inattention, weather conditions, lack of maintenance of vehicles and minimal safety features on older apparatus.”*

*“At 41, the number of deaths of volunteer firefighters in 2009 is the lowest it’s been since 1994. Deaths among volunteers has tended to fluctuate between the mid-40s and the mid-60s. With the exception of 2007, when nine career firefighters were killed in a single incident, the number of on-duty deaths of career firefighters annually continues its plateau of approximately 30 deaths each year. (There were 31 in 2009.)”*

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*“As in most years, the number one cause of on-duty firefighter fatalities was sudden cardiac death. The number of such deaths has been trending downwards since the late 1970s, but they have leveled off at under 40 deaths while on-duty each year and continue to account for approximately 40 percent of the deaths annually.”*

## Discussion

The fact that the overall number of fire fighter fatalities declined in 2009 is indeed good news, but, even better news is that the statistics and data provided in the NFPA report indicate that there is a potential for further sharp reductions in the annual number of fire fighter fatalities.

What is interesting to note about the statistics on fire ground fatalities is the relatively few fatalities occurring at structure fires.

As in previous years, sudden cardiac death accounted for roughly 40 percent of the fire fighter fatalities in 2009. The information on fire fighter health provided in the report clearly indicates that further sharp reductions in fire fighter fatalities can be made if the fire service makes further strides in addressing “health issues”.

What is interesting to note about the statistics on fire ground fatalities is the relatively few fatalities occurring at structure fires. Based upon the data provided in the NFPA report, it appears that no more than 7 fatalities occurred as a result of structural collapses and all of these fatalities occurred in buildings which were not protected by a sprinkler system.

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The NFPA data indicates that 4 fire fighter fatalities occurred as a result of suppression operations at fires in vacant houses.

What this statistic appears to indicate is that over-aggressive fire fighting tactics were utilized. There seems to be little justification for losing fire fighters trying to reduce property losses in vacant buildings. The same can also be said about losing fire fighters in occupied buildings too.

## Conclusions

Based upon the NFPA report, it is my opinion that the number of fire fighter fatalities can be drastically reduced by implementing the following:

- The adoption of minimum fire fighter health standards by the fire service and mandatory retirement requirements for fire fighters who do not meet these standards.
- The adoption of maximum age limitations by the fire service.
- The adoption of policies which limit the use of aggressive fire fighting tactics.

**The adoption of minimum fire fighter health standards by the fire service and mandatory retirement requirements for fire fighters who do not meet these standards.**

It is also my opinion that the fire service should also take note of the fire fighter safety record for buildings which are provided with sprinkler protection. Rather than advocating the concept of “balanced fire protection” as the fire service has done in recent years, the fire service should once again become strong advocates for sprinkler “trade-offs” and advocate that more resources be allocated to making sure that sprinkler protection in existing buildings is properly maintained. The “trade-offs” allowed for sprinkler protection will pay for the additional resources allocated for the maintenance of sprinkler protection.

Mandating additional passive fire protection in buildings protected by a sprinkler system is neither the best, nor the optimal means for reducing fire fighter fatalities (and injuries). Making sure that the sprinkler protection is both adequate and operable when a fire occurs is the simplest and most reliable way to minimize the dangers to fire fighters in building structure fires. (Most fires in buildings will be controlled by the operation of 1 or 2 sprinklers and many fires will be completely extinguished by sprinkler operation prior to the arrival of fire department.)

**Editor’s Note:** The author, Richard Schulte, was the recipient of Engineering News-Record’s “**Top 25 Newsmakers of 2004**” award and the American Institute of Steel Construction’s “**Special Achievement Award**” in 2006 for his commentary on NIST’s investigation into the collapse of the World Trade Center towers. Mr. Schulte’s experience includes work as the fire protection engineer for the San Jose (California) Fire Department (1980-1982).

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