



## 20 Years of Electrical Injury Data Shows Substantial Electrical Safety Improvement

The US Bureau of Labor Statistics (BLS) first began to compile its Census of Fatal Occupational Injuries (CFOI) in 1992. This actual count of on-the-job injuries and illnesses has since been accepted by the National Safety Council as the definitive census of occupational injuries in the US. Each fatality is verified by at least two authoritative sources such as death certificates, police reports, newspaper articles, etc. In addition, the BLS also estimates the annual number of nonfatal injuries to US workers through its Survey of Occupational Injuries and Illnesses (SOII). The SOII is a statistical estimate of nonfatal injuries based on a survey of more than 200,000 employers each year.

The Electrical Safety Foundation International (ESFI) uses CFOI and SOII to distill information specifically pertaining to fatal and nonfatal occupational electrical injuries. Each year the ESFI publishes electrical injury information in tabular and graphical form on its website<sup>1</sup>. The most recent data covers the 20 year period from 1992-2010, but mainly focuses on 2003-2010 data. The rest of this article discusses some of the more interesting patterns observed.

Since 1992 fatal electrical injuries have declined by more than 50% on an annual basis, and that trend has accelerated since 2006. For the 15 year period from 1992-2006, there was a 25% decline in annual electrical fatalities, but in just five years from 2006-2010 electrical fatalities declined by one-third (see Figure 1). "Contact with Overhead Power Lines" (includes direct worker contact and contact through machines, tools, and hand-carried metallic objects) was the largest fatal accident category comprising 44% of all electrical fatalities for 1992-2010. "Contact with Wiring, Transformers, or Other Electrical Components" (most common for workers who install, repair, or maintain electrical systems and apparatus in the normal course of their electrical work) was the second-largest fatal injury category with 27% of all fatalities, followed by "Contact with Electric Current of Machine, Tool, Appliance, or Light Fixture" (most common for workers who use electrical tools and apparatus in the normal course of their non-electrical work) with 17%. Even though the number of fatal accidents declined by 50% the relative percentage contribution of the three largest accident categories remained stable (see Figure 2).

Nonfatal electrical injuries have shown an even more dramatic improvement. In 2010 nonfatal electrical injuries are down by more than 60% from their 1992 level. The two largest categories of nonfatal electrical injury are "Contact with electric current of a machine, tool, appliance, or light fixture" and "Contact with wiring, transformers, or other electrical components". Figure 3 shows that the relative contribution of the two largest categories has remained relatively unchanged despite the 60% decline in total nonfatal electrical accidents.

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<sup>1</sup> Fatal and nonfatal electrical injury information can be found on the ESFI website at <http://www.esfi.org/index.cfm/cdid/11510/pid/10272>



Just five occupational groups account for nearly 80% of all fatal electrical accidents. “Construction Trades Workers” alone represent about 38% of all electrical fatalities. Other occupational groups with high numbers of electrical fatalities are “Installation, Maintenance, and Repair Occupations” (21%), “Grounds Maintenance Workers” (7%), “Transportation and Moving Materials Occupations” (6%), “Other Management Occupations” (4%), and “Agricultural Workers” (2%). The Construction industry experienced 52% of total electrical fatalities and far outpaces all others (See Figure 4).

BLS data show that as few as 1 to 4 electrical fatalities annually were attributed to electrical burns for 2003-2010. Some electrical safety experts consider this to be an undercount. About 39% of nonfatal electrical injuries are electrical burns. In the Construction industry, about 57% of electrical injuries are burns. The Utility industry is the only other in which nonfatal burn injuries outnumber electrical shock injuries (76%). The Utility industry has the highest rate of nonfatal electric burn injury at 1.6 cases per 10,000 workers in 2010, followed by the Construction industry at 0.4 cases. The overall electrical burn rate for Private Industry remained at 0.1 cases per 10,000 workers for 2003-2010.

The Construction industry, however, had the highest rate of nonfatal electric shock injuries at 0.6 cases per 10,000 workers whereas the Utility industry improved from 0.7 cases in 2009 to 0.4 cases in 2010. The overall electric shock rate for Private Industry remained at 0.2 cases per 10,000 workers for 2003-2010.

Since 1992 both fatal and nonfatal electrical injuries have shown significant and sustained declines. The recent slowdown in economic activity has probably contributed to the even sharper declines in electrical accidents over the last few years. “Contact with Overhead Power Lines” remains a significant problem accounting for nearly one-half of all occupational electrical fatalities. The fatal data for 1992-2010 show that although the number of electrical fatalities has decreased, the overall mix of fatal accidents remains largely unchanged. The same can be said for nonfatal electrical accidents. The Construction and Utility industries remains problem areas in terms of both fatal and nonfatal electrical accidents. Although the Construction industry sustains a much larger number of electrical injuries than the Utility industry, the Utility industry exhibits a higher rate of both fatal and nonfatal electrical injury.

The advancement of NFPA 70E as an important electrical safety standard is surely a component of the reduction of occupational electrical accidents. Real improvement in electrical safety can be sustained through the increased use of the techniques and methods found in 70 E and through training targeted at people in high risk occupations and industries. Electrical safety is an area where perseverance pays off.

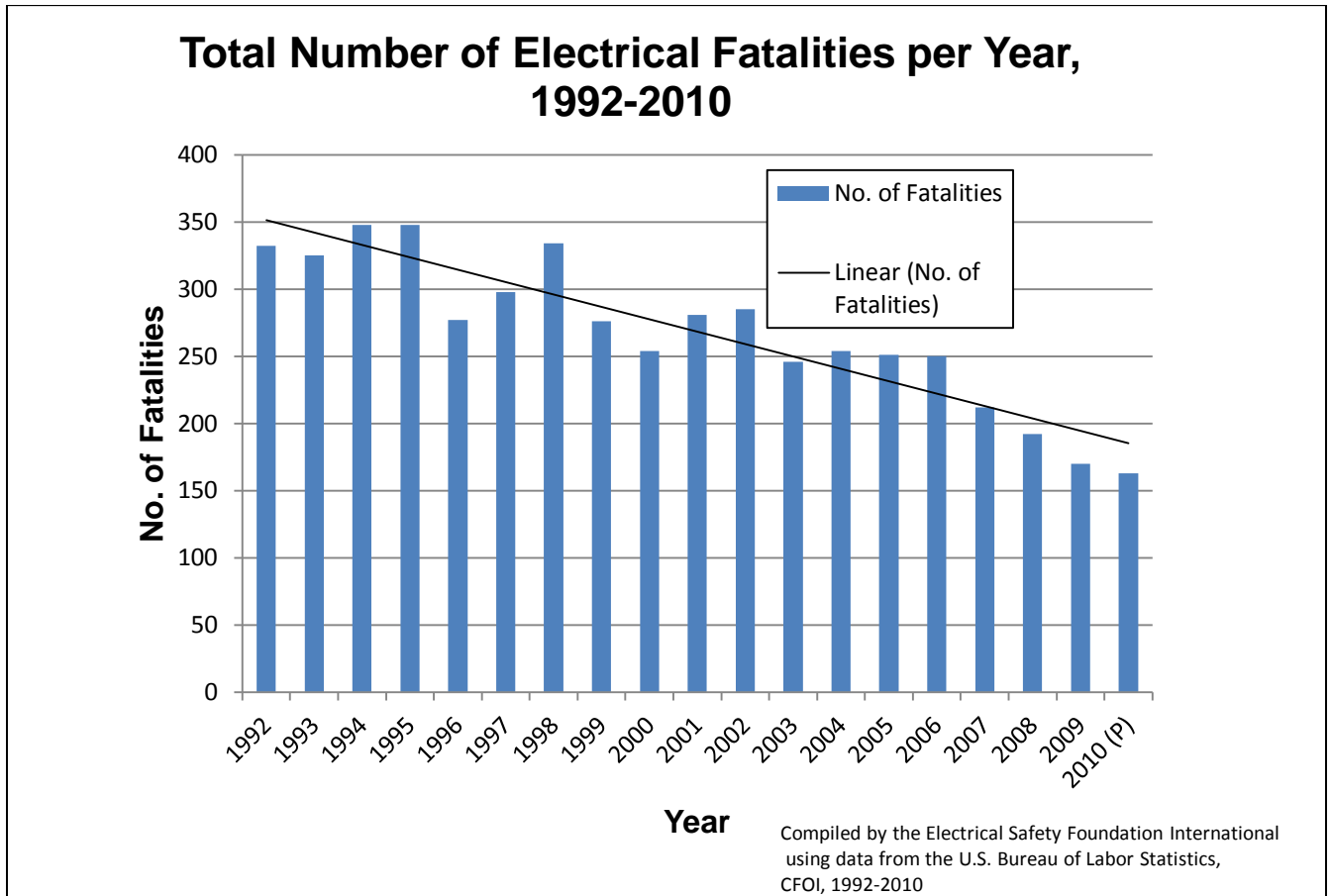


Figure 1. Annual electrical fatalities declined by more than 50% for the period 1992-2010.

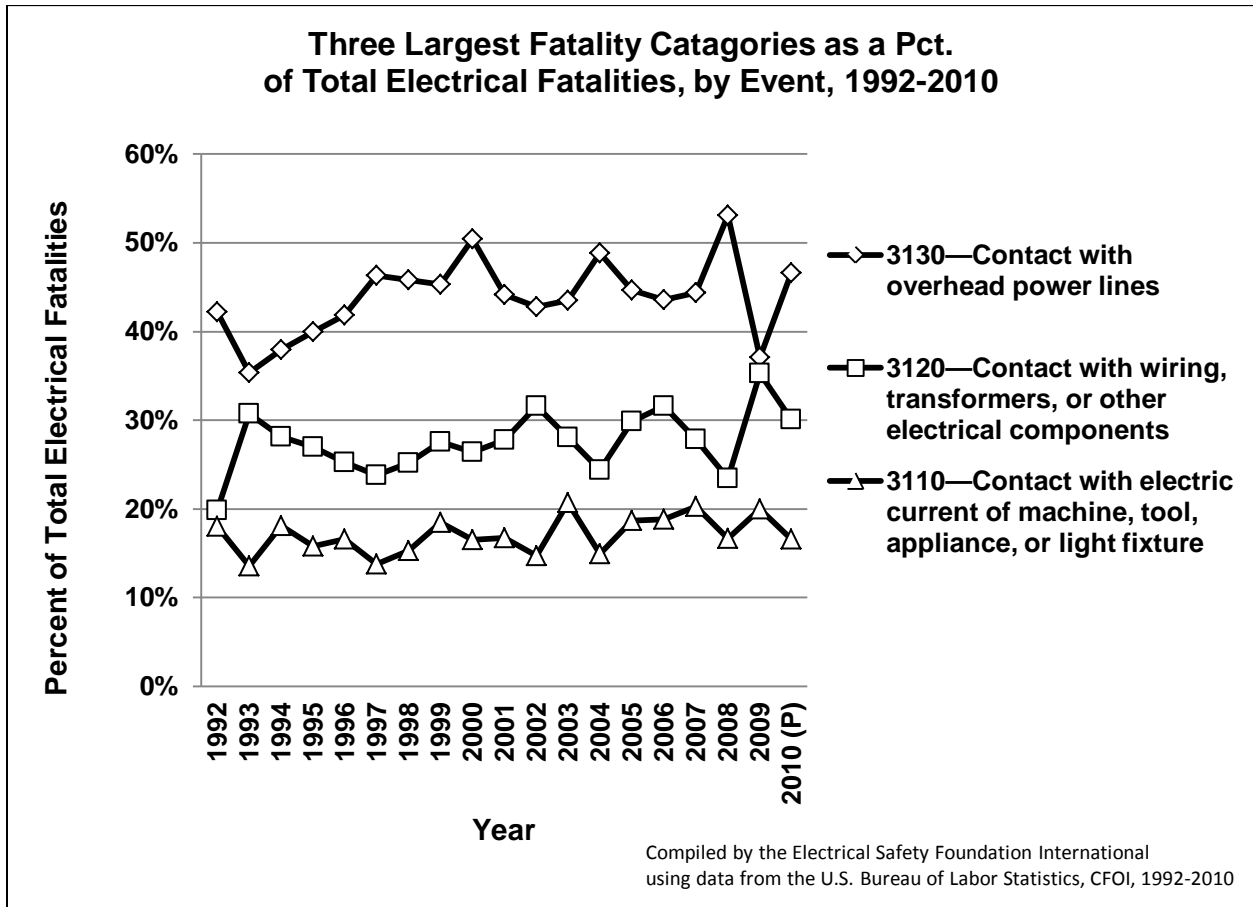
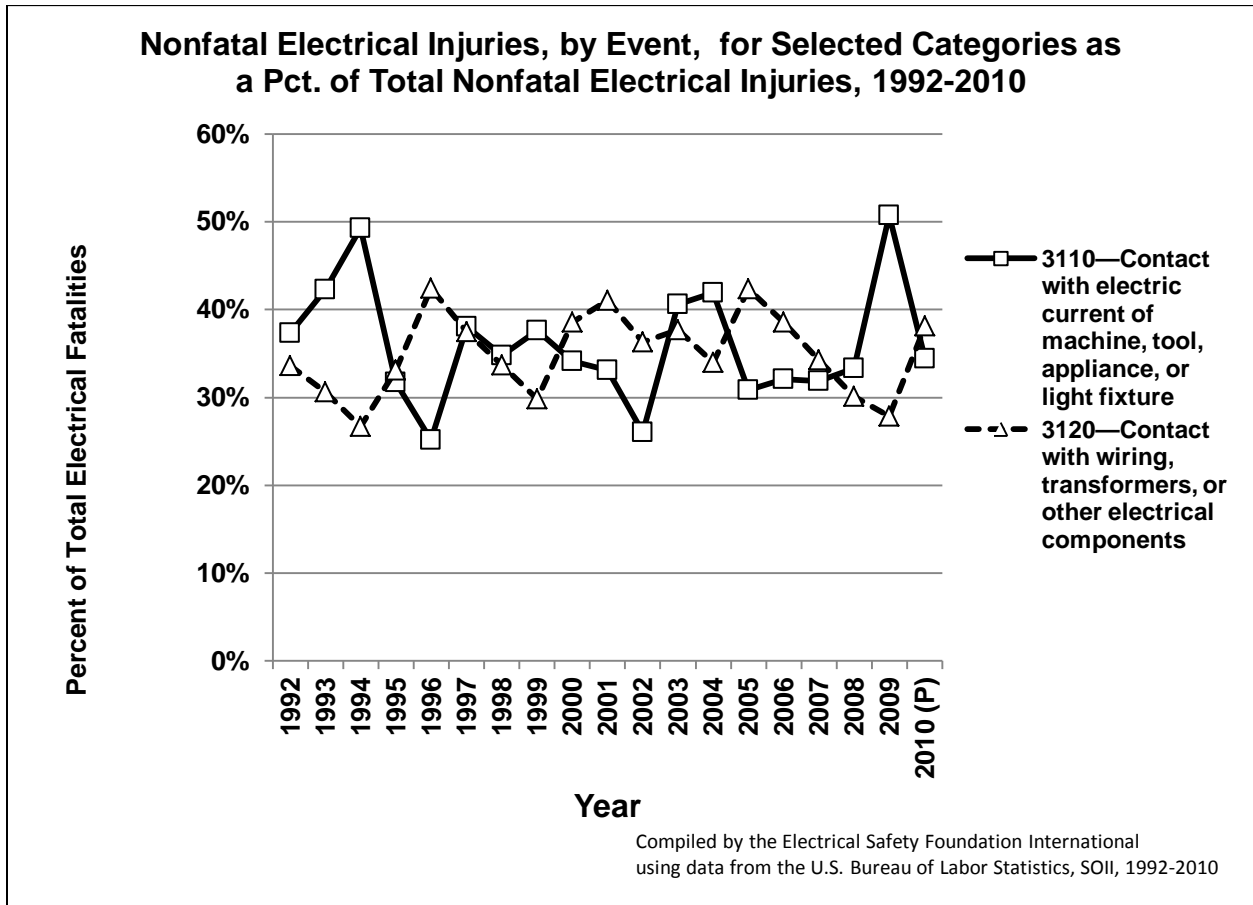


Figure 2. The percentage contribution of the three largest categories of fatal electrical accidents remained relatively unchanged despite a 50% decline in the total number of fatal electrical accidents.



**Figure 3.** Nonfatal electrical injuries as a percentage of the total for the two largest categories of electrical accidents remained relatively unchanged for 1992-2010 even though the total number of nonfatal electrical accidents declined by more than 60%.

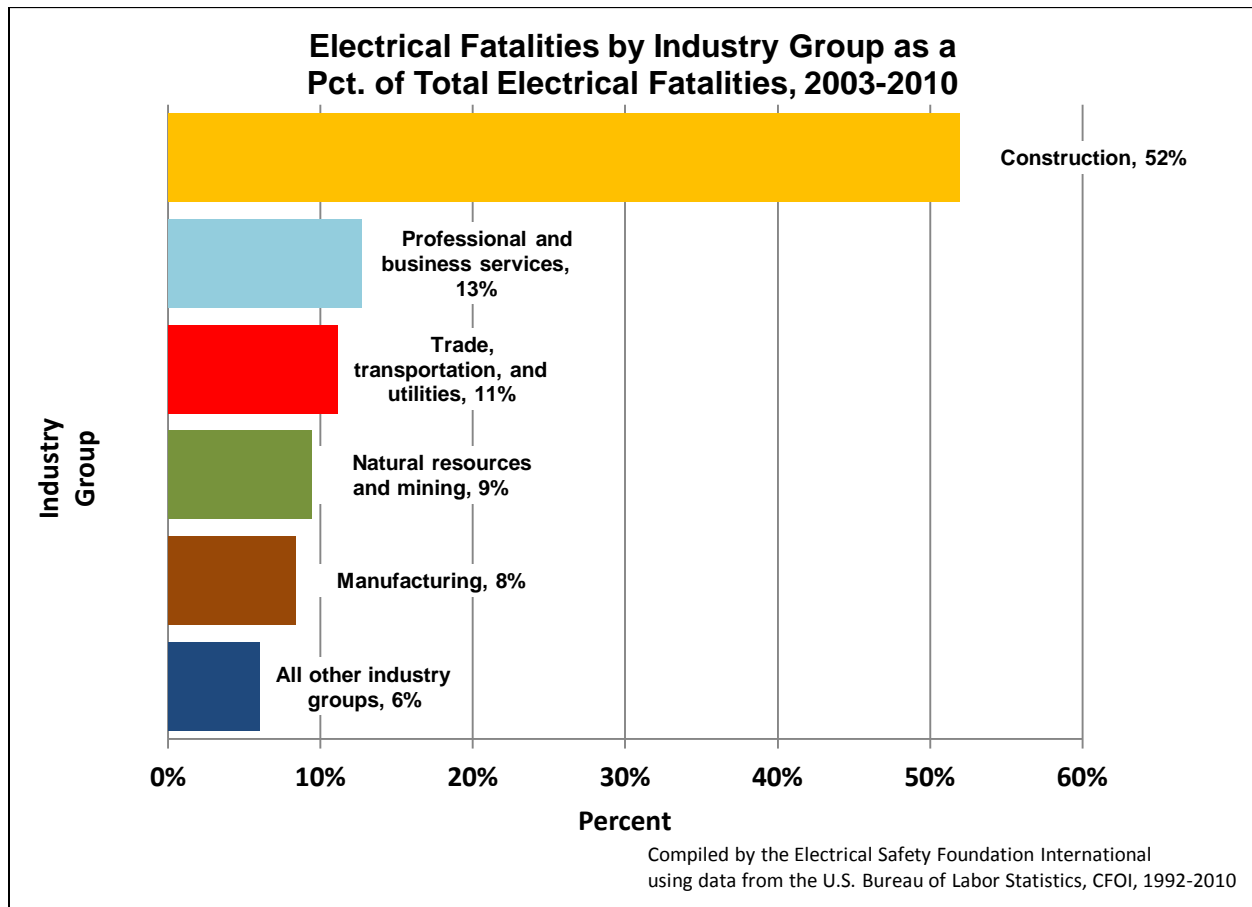


Figure 4. The construction industry alone sustained 52% of all electrical fatal electrical accidents for the period 2003-2010.