

ARC FLASH ACCIDENT-INJURY STATISTICS: AN ALARMING REALITY

Electrocution is the fifth leading cause of work place fatalities in the U.S.
One to two fatalities occur daily due to arc flash in North America.
97% of all electricians have been shocked or injured on the job.

These are alarming statistics! This is a surprisingly high number when you consider the limited number of electricians in the workplace today.

Michael Tesmer, Certified Safety Advisor for Conney Safety Products, comments:

"I have been conducting OSHA 10 training for many years and have never heard of an electrician not being shocked at some point in their career. That both bothers and scares me. I graduated with a degree in Occupational Safety and Health in 1987 and have worked in various industrial environments solely focused on safety throughout my working career. I had never heard about arc flash until after the 1990s (even then, it was a foreign topic that didn't make sense to me). While the potential for arc explosions has been around as long as electricity, there simply wasn't much research done until recently regarding all the factors going into this phenomenon. Safety people didn't talk much about it because the understanding and research wasn't there!"



The Dangers of Arc Flash in the Workplace

While indeed, workers can be shocked when an arc flash occurs, the shock and the arc flash do not always happen concurrently—one or the other can occur independently. This is probably why you don't see horrific burns on most electricians that have been shocked (some of whom have boasted being shocked more than 10 times in their career!).

EVERY 30 MINUTES
during the work day, a worker suffers
an electrically induced **injury** that
requires time off of the job for recovery.



So, what is being done to address these sobering statistics? While OSHA 1910.333 discusses the importance of working on de-energized parts, many feel that current regulations do not have the teeth to encourage companies to address arc flash concerns. NFPA 70E is a standard for electrical safety requirements for employees (but only referenced by OSHA after incidents occur). This standard focuses on practical safeguards that also allow workers to be productive within their job functions. This standard should be a guide for all businesses to follow in keeping exposed workers safe from electrical hazards.

All too often electricians perform electrical work on live equipment, and that shouldn't be allowed to happen. Management often elects to not shut down equipment (due to cost) and tends to push their workers to perform certain activities while the equipment is live. Granted, while there are legitimate reasons to do work live, companies have to be mindful of the dangers when allowing this to occur.

Important Safety Steps for Companies:

- 1) Have the workers received "Qualified Worker" training that covers detailed aspects of the NFPA 70E standard?
- 2) Has a proper Arc Flash Study been documented and all equipment labeled so that workers are aware of specific shock protection boundaries? (NOTE: If an arc flash study has not been completed, you can cautiously consider using the "Task Chart" found in NFPA 70E, provided you know the fault current and fault clearing time).
- 3) Do the Qualified Workers have the correct Arc Flash Clothing to perform the required job tasks where a potential exposure could occur?



480V ACCIDENTS

more accidents occur with 480V equipment than on higher voltage equipment

Arc Flash Accident/Injury Statistics

The statistics clearly show that some (or all) of these three aforementioned steps do not occur at many of the work sites across the U.S. Take a minute to review the arc flash accident/injury statistics below:

1. Every day, one to two arc flash related fatalities occur across North America. ##
2. Electrocution is the fifth leading cause of work place fatalities in the US.* (A surprisingly high number considering the few people who perform "electrical work" as a standard part of their job; arc flash fatalities are not counted in this statistic—they are logged under burn injuries, meaning that the rates are even higher.)
3. 60% of workplace fatalities are caused by burn injuries.*
4. Electrical shock is the second leading cause for lost time on the job (second only to burns).*
5. 97% of electricians have been shocked or injured on the job.
6. Every 30 minutes during the work day, a worker suffers an electrically induced injury that requires time off the job for recovery.**
7. Over the last ten years, more than 46,000 workers have been injured from on-the-job electrical hazards.**
8. An estimated five to ten arc flash explosions occur daily across the US. #
9. 2,000 workers are treated in specialized burn trauma centers each year as a result of arc flash injuries.** These high-tech facilities only treat the most devastated burn victims—those who have sustained incurable third-degree burns over more than half of their body.



10. Arc flash injuries are actually much higher than reported because workers receiving treatment for trauma and burns that do not require burn unit attention (i.e. second degree burns or third degree burns covering less than half their body) are admitted to standard hospitals which do not track the burn source.
11. Medical costs for severe electrical burns can exceed \$4M per person.**##
12. Work-related injuries can cost businesses well over \$30M in fines, medical costs, litigation, lost business, and equipment costs.***# ("A good safety program is just good business.")
13. More accidents occur with 480V equipment than on higher voltage equipment.
14. Incident energy calculations, and therefore, PPE selection are based on equipment that is "properly installed and properly maintained." Most manufacturers recommend exercising breakers at least once per year to lubricate the inner working of the breaker mechanisms.#
15. 21% of electrical injuries (including arc flash) tended to be permanent.



**46,000
WORKERS**

have been injured on the job due to electrical hazards during the past 10 years

References:

- * Bureau of Labor Statistics
- ** ESFI (Electrical Safety Foundation International)
- *** St. John's Rehab Hospital (Dr. Joel Fish)
- # NFPA 70E
- ## CapSchell, inc
- ### NIOSH (National Institute of Occupational Safety & Health)
- *# Electrical Safety Workshop Conference Proceedings, 2010; Update of Field Analysis of Arc Flash Incidents, PPE Protective Performance and Related Worker Injuries; Doan, Hoagland & Neal
- ***# National Safety Council
- ## Electricite de France