MEG alert™
Safety Awareness Systems

Meg-Alert specializes in the design and manufacture of safety awareness systems. Meg-Alert solutions greatly reduce the risks associated with arc flash accidents.

What is an Arc Flash?

- An Arc Flash is the sudden release of electrical energy through the air following a phase-to-phase or phase-to-ground fault. The resulting forces produced are known as the "Arc Blast".

- The core of the arc flash can reach temperatures of 35,000 °F (19427°C) in less than 1/1000th of a second; ###. That's roughly four times the temperature of the surface of the sun.

- The intense heat turns copper to a plasma state in a fraction of a second, making it expand 67,000 times its solid-state size (meaning a pea-sized piece of copper, ends up being the size of a typical rail car in a fraction of a second).

- This rapid expansion of copper and the surrounding atmosphere causes a pressure wave that has been measured at thousands of pounds, propelling shrapnel at speeds of 700 miles per hour.

- The flash of light produced is intense enough to damage eye-sight.

- The sound wave can exceed 140 to 165 dB. Exposure to a single event of such magnitude can permanently damage hearing.*#

- Even low voltage electrical shock has been shown to cause sustained "invisible" injury that manifests itself over the course of the days or weeks following the initial event. The injuries can take the form of numbness, muscle weakness, general or localized fatigue, and cognitive dysfunction, including memory change or loss, concentration issues, and post-traumatic stress, among others. These side effects of shock have only recently become the subject of research so that the medical community can begin to understand this phenomenon.***

References

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**
***** St. John's Rehab Hospital (Dr. Joel Fish)**

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Arc Flash Accident/Injury Statistics

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. **80% of electrically related accidents and fatalities involving "Qualified Workers" are caused by arc flash / arc blast.*#***

9. **An estimated five to ten arc flash explosions occur daily across the US. #**

10. **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.**

11. **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.**

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12. Medical costs for severe electrical burns can exceed $4M per person.##**

13. 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."**

14. Arc Flash events are sustainable even at 480V. Incident energy in 480V equipment is often higher than in higher voltage equipment due to the increased current and higher clearing time in these applications when compared to higher voltage applications.

15. More accidents occur with 480V equipment than on higher voltage equipment.

16. Field tests and surveys have shown that 22% of breakers operate at less than 100% efficiency (slow trip), and more than 10% have been shown not to close at all. Even the slightest delay in the operation of a breaker or fuse, will double or triple the available incident energy in an arc flash event.*#*#

17. 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.#

18. 21% of electrical injuries (including arc flash) tended to be permanent. #*#

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
Electrical Safety Workshop Conference Proceedings, 2009; Field Measured Total Clearing Time of Protective Devices and its Effect on Electrical Hazards; Heid & Widup
**## National Safety Council
OSHA
#*# Electricite de France