

# Avoiding Complacency

Week Number 23 (June 4 - 10) 2017 Edition

## **OBJECTIVES**

*Upon completion of this safety talk, participants will be able to:*

- *Identify the hazards of electricity on the human body.*
- *Know the physical hazards associated with an arc flash.*

Too often familiarity leads to complacency. As electricians, we need to be reminded of all the hazards associated with that part of our job which is most familiar, electricity. First on the list and the one we are most familiar with is shock. Unfortunately, this is not always addressed completely. The next hazard is arc flash. We all know that an arc flash (or arc blast) is a type of electrical explosion that results when a short circuit occurs through air. When an object offering a path to ground or a lower voltage comes near an exposed live circuit or part the current will flash over. And, of course, the final hazard is the fire hazard associated with electricity.

Looking more closely at the shock hazard you need to understand a little more about the body and electricity. Your body uses electrical impulses to move your muscles. Electrical current, when passing through any object generates heat. Considering both factors you can better understand what happens when you get a shock. The external electricity during a shock over-powers the impulse of your nerves. If muscles over-contract as a result, bones will break. If it takes over your heart muscle, it can stop beating. As the current enters and exits the body, it will burn those sites. It may also burn nerves, blood vessels and internal organs as it passes between these points.

When an arc flash occurs, energy is released in the form of light, noise, heat and pressure. Temperatures associated with an arc-flash can reach 35,000o F. High-intensity flash can cause damage to the eyesight. Pressures can reach thousands of pounds per square foot. This pressure alone can cause damage, but combined with the molten metal from the heat generated can shoot shrapnel at speeds of more than 700 mph. The noise created can exceed 160 dB causing permanent hearing damage.

Last, but not least of the dangers, is fire. Heat from the flash can ignite almost anything. But, even without a flash, the heat that is generated when current is forced through an object with high resistance can reach levels that will cause a fire. Consider the heat caused when a homeowner at Christmas overloads an extension cord and then places the cord under a carpet. The heat captured will melt the cord and ignite the carpet.

With knowledge of all the hazards associated with electricity, you should recognize the dangers. Observe warning signs. Listen to the precautions offered in safety talks on electricity and observe boundaries established for qualified and unqualified workers.

## **DISCUSSION QUESTIONS**

- What can happen if external electricity takes over the muscles of the heart?
- Why does electricity cause muscles to contract?
- Why is it important to pay attention to an arc flash?
- How can fire occur from an arc flash?