

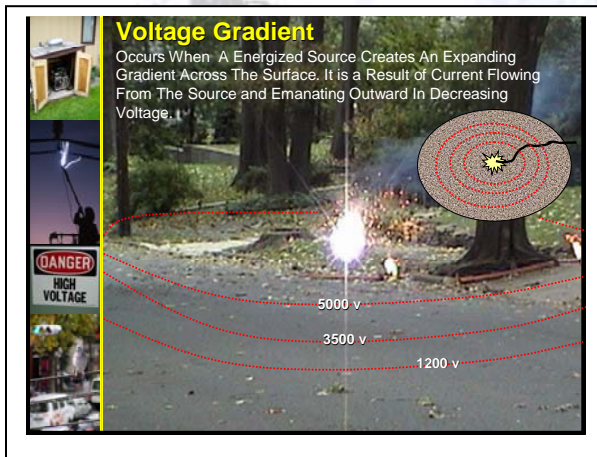
LESSONS LEARNED-

I recently attended an excellent class on utility incidents. Half of the class was focused on electrical incidents. During the class the instructor referenced several NIOSH Line of Duty Death reports where firefighters were killed or seriously injured from contact with electricity, specifically “power lines down”. Out of curiosity I searched the NIOSH page myself and found 8 documented incidents in which nearly a dozen firefighters were killed or seriously injured from “power lines down”. Remarkably, a few of the cases the crews acknowledged there were power lines down in the area however fatalities still occurred. Even more remarkable are the cases where firefighters were knowingly working immediately adjacent to live lines and still contact was made and fatalities occurred.

San Benito-Monterey Unit has the misfortune of having a firefighter Line of Duty Death caused by electrocution while working on a vegetation fire. Even as recent as last year a near miss incident occurred involving two of our own being contacted by a utility line. Fortunately there were no major injuries.

One could say that annually we risk our lives responding to “power lines down”. The adage “If it’s predictable, it’s preventable.” rings true. So much so that we train to deal with power lines down. A recent drill posed the threat of a simulated power line down on a residential structure fire. The results were shocking (pun intended). Three firefighters would have died or been seriously injured had this been a real incident. They either did not recognize or ignored the downed line and stepped on, over or came in contact with someone who was energized.

Although this was a training exercise, we train as we fight. We are to assume all down lines to be HOT! We do not get near them. It is recommended to stay a minimum of 10 feet away from the line. There are two reasons for this; voltage gradient and step potential.



Voltage gradient happens when a downed energized wire is in contact with the earth; there is current running to ground. Not only is there the usual current traveling to ground at the point of contact, but there is also a gradient, or decreasing current, emanating from the point of contact which spreads out concentrically from the wire point or point of contact like ripples in a pond.

This gradient created different levels of voltage as it gets further away from the original point of contact presenting a dangerous hazard known as step potential.

Step potential occurs when responders or victims create a circuit with their feet as they walk over or across this voltage gradient. Since the responder is standing in two different points with different voltage, a path or circuit is created by his or her legs and current and or shock will occur. If the voltage is great enough, death or serious injury can result. In lower voltage situations responders have described the gradient potential as a tingling sensation in the feet and lower extremities.



Voltage gradients can extend large distances. In transmission line emergencies it can extend as much as 100 feet on either side of the right of way. These gradients are also affected by the ground, materials, moisture content, water spray and humidity.

Recommendations:

1. Locate & identify a downed line and assume it to be HOT.
2. Minimum distance for responders is 10 feet for conductors carrying all voltage up to 50kV. "Keep your dime." With transmission emergencies the distance increases to 35 feet from wires and in heavy smoke can increase to 100' in all directions.
3. Flag the area with Black and yellow stripped electrical tape, minimum of 25 foot radius, and notify the Incident Commander.
4. Prevent anyone from operating in that area. Control the perimeter.
5. Do NOT touch, jump over or disregard the downed line.

This winter is sure to bring situations which could pose a threat to your life as well as your firefighters. Please follow the recommendations above. Train your firefighters on the potential hazard of "lines down". Nobody wants to be a NIOSH statistic.

This section is dedicated to all those who lost their lives in the line of duty. May we learn from your misfortune and prevent it from happening to others.