



Transmission lines carry power over extended distances along Utah's Wasatch Front.

WHAT IS A CIRCUIT BREAKER?

The National Electrical Code defines a circuit breaker as, "A device designed to open and close a circuit by nonautomatic means and to open the circuit automatically on a predetermined overcurrent without damage to itself when properly applied within its rating." In essence, a circuit breaker is a specialty switch that can be controlled to automatically open when certain conditions are present. They are present in residences, commercial facilities, utility power systems, and even some cars. Generally, their purpose is to limit the scope of damage to the power system and to personnel when a fault occurs on the system. (see the April 2010 issue of the Palmer Flash for a discussion of "What is a Fault?")

News Flash...

We are very pleased to congratulate JR Koehler on completing the certification as a Haag Certified Roofing Inspector. This adds to his considerable expertise as a Civil/Structural engineer who also performs structural repair design and investigation of structural and building envelope failures including roofs, foundations, and walls. Check out his background on our web site (<http://www.pe4n6.com/personnel>).

The Palmer Flash is a quarterly newsletter of Palmer Engineering and Forensics, LLC. We welcome your feedback, questions, and comments, just drop us a quick note at info@pe4n6.com.

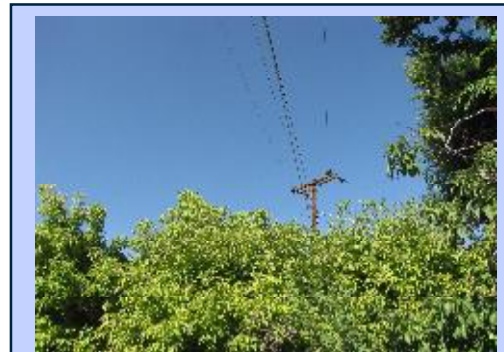
Why do my lights blink during a storm?

Most of us have had the experience of sitting at home during a storm and having the lights go out. Occasionally, they blink off and on multiple times, then go off for an extended period before finally coming back on for good. Why? The electricity that we use in our homes must be conveyed over long distances from power plants (which are generally not permitted or appreciated in neighborhoods or back yards). The power system that carries the electricity consists of various components including transmission lines, substations, distribution lines, and distribution transformers. Interactions between the weather and the extensive power system can come in numerous forms, including wind blowing branches into distribution lines, wind blowing distribution lines together, wind breaking conductors or support structures, lightning striking power lines, or conductors breaking due to the weight of accumulated ice and/or snow. When one of these situations (fault conditions) occurs, the result is generally a flow of excessive current which causes the power system protection devices to operate (think fuses and circuit breakers on a large scale). More often than not, the cause of the fault condition is transient and causes no permanent damage to the system. Therefore, to minimize the duration of the outage, many of the circuit breakers (or similar devices called reclosers) have automatic controls to reconnect the system a very short time (less than one second) after disconnecting. If the fault condition is still there, the protection again disconnects the system and leaves it off for a few seconds before reconnecting. Some will have a third attempt to reconnect, but if the fault is still there, the automation is disabled and the power remains off until utility personnel have a chance to get into the field and determine the nature of the fault condition. The automatic opening and closing of the power system protection equipment gives the customer the effect of the lights blinking.

Do you have a basic engineering question that you would like discussed in the next issue of Palmer

Flash? Send it by email to info@pe4n6.com.

Interactions between distribution lines and trees are a major cause of power system disruptions during storms.



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