

Wireless Smart Meters and Potential for Electrical Fires

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Typical gauge electrical wiring that provides electricity to buildings (60 Hz power) is not constructed or intended to carry high frequency harmonics that are increasingly present on normal electrical wiring. The exponential increase in use of appliances, variable speed motors, office and computer equipment and wireless technologies has greatly increased these harmonics in community electrical grids and the buildings they serve with electricity. Harmonics are higher frequencies than 60 Hz that carry more energy, and ride along on the electrical wiring in bursts. Radio frequency (RF) is an unintentional by-product on this electrical wiring.

It may be contributing to electrical fires where there is a weak spot (older wiring, undersized neutrals for the electrical load, poor grounding, use of aluminum conductors, etc.). The use of smart meters will place an entirely new and significantly increased burden on existing electrical wiring because of the very short, very high intensity wireless emissions (radio frequency bursts) that the meters produce to signal the utility about energy usage.

There have now been electrical fires reported where smart meters have been installed in several counties in California, in Alabama, and in other countries like New Zealand. Reports detail that the meters themselves can smoke, smolder and catch fire, they can explode, or they can simply create over-current conditions on the electrical circuits.

Electrical wiring is not sized for the amount of energy that radio frequency and microwave radiation have. These unintended signals that can come from new wireless sources of many kinds are particularly a worry for the new smart meters that produce very high intensity radio frequency energy in short bursts. Electrical fires are likely to be a potential problem.

Electrical wiring was never intended to carry this – what amounts to an RF pollutant – on the wiring. The higher the frequency, the greater the energy contained. It's not the voltage, but it is the current that matters. RF harmonics on electrical systems can come from computers, printers, FAX machines, electronic ballasts and other sources like variable speed motors and appliances that distort the normal, smooth 60 hertz sine wave of electrical power and put bursts of higher energy RF onto the wiring.

Wireless smart meters don't intentionally use the electrical system to send their RF signal back to the utility (to report energy usage, etc). But, when the wireless signal is produced in the meter... it boomerangs around on all the conductive components and can be coupled onto the wiring, water and gas lines, etc. where it can be carried to other parts of the residence or building.

It is an over-current condition on the wiring. It produces heat where the neutral cannot properly handle it. The location of the fire does NOT have to be in close proximity to the main electrical panel where the smart meter is installed.

A forensic team investigating any electrical fire should now be looking for connections to smart meters as a possible contributing factor to fires. Every electrical fire should be investigated for the presence of smart meter installation. Were smart meters installed anywhere in the main electrical panel for this building? For fires that are 'unexplained' or termed electrical in nature, fire inspectors should check whether smart meters were installed within the last year or so at the main panel serving the buildings. They should question contractors and electricians who may have observed damage from the fire such as damage along a neutral, melted aluminum conductor or other evidence that would imply an over-current condition. They should also look for a scorched or burned smart meter, or burn or smoke damage to the area around the smart meter. Problems may be seen immediately, with a smart meter smoking or exploding. Or, it may be months before the right conditions prevail and a neutral circuit overloads and causes a fire. The fire may or may not be right at the smart meter.

- Any smart meter installed in a main panel might start an electrical fire in that building; it would not be necessary for the unit itself to have a smart meter. The RF emissions from any smart meter in the main panel might trigger an electrical fire at any location in the building served by this main panel because harmonics can and will travel anywhere on electrical wiring of that building.

Some questions that should be asked include:

- Were smart meters installed in the main electrical panel for this building? Problems may be seen immediately, with a smart meter smoking or exploding. Or, it may be months before the right conditions prevail and a neutral circuit overloads and causes a fire. The fire may or may not be at the smart meter.
- Is there damage at the smart meter itself (burning, scorching, explosion)?
- Was there fire damage, a source, or a suspicious area around the neutral where it connected to the main panel or at the breaker panel?
- Was the damage around a lug at a connection on the neutral conductor in the attic at Xanadu? Was there any indication of heating or scorching or other thermal damage around the neutral in the area of the fire?
- Was aluminum conductor present? Aluminum conductors that were installed in the '70s are today recognized as more of a problem for heating than copper wire. Was the aluminum, if present, showing heat damage or melting?

Even before smart meters were being installed widely in California, people who know something about EMF and RF were expressing concerns that this kind of thing would

likely happen (electrical fires due to overcurrent condition from RF signal). What is already postulated, and of concern, is that the rising use of equipment that put RF harmonics onto the electrical wiring of buildings may overload that wiring. Faulty wiring, faulty grounding or over-burdened electrical wiring may be unable to take the additional energy load.

[1] Advanced Metering Infrastructure; January 2010 Semi-Annual Assessment Report and SmartMeter™Program Quarterly Report (Updated), Pacific Gas and Electric Company.