

EXPOSED - Electronic Utility Meters An Electrical Fire Hazard

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Introduction

In the mid-2000s, utility companies began a massive effort to replace electromechanical analog utility meters with radiofrequency transmitting electronic utility meters.

Utility companies and government regulators, with the support of several large environmental groups, including the Environmental Defense Fund, the Natural Resources Defense Council and the Sierra Club, rushed to embrace electronic utility meters. This was done with no public input. It was done without considering the health, electrical fire safety and privacy risks of imposing millions of electronic communication metering devices on an electrical utility system that was developed with non-electronic analog meters.

This paper exposes the reckless decision, by meter manufacturers, utility companies and government regulators to eliminate life-saving electrical safety features from the design of electronic meters.

Dangerous Electronic Meters vs. Safer Analog Meters

Electronic meters that contain electronic components are also named "smart," AMR, ERT, AMI, digital opt-out, digital radio-off, Power Line Carrier (PLC) and more. Electronic meters are designed to harvest personal utility usage data from consumers to sell to third parties, without permission, and to cut meter-reading costs. These meters consume electricity and have no proven environmental benefits.

Electronic meters contain fragile miniaturized electronic circuit boards that are prone to igniting and exploding when exposed to utility-side electrical surge events and outdoor weather conditions. Electronic meters pose unacceptable hazards because they lack adequate surge arrestors¹ and the necessary circuit breakers² to protect the building and its occupants in the case that a fault develops in the electronic meter. Without these essential electrical safety features electronic meters are an open portal for dangerous voltage surges and cause electrical fires both at the electronic meter and inside buildings.

That is one of the reasons why, after less than a decade of use, electronic utility meters have caused personal injuries and deaths,³ interior and exterior home and business fires, extensive property damage and electrical equipment damage.

The installation of electronic meters on homes and businesses has resulted in thousands of reported incidents of health,⁴ fire,⁵ electrical,⁶ privacy,⁷ and over-billing complaints. According to cyber-security experts, electronic meters are an unaddressed and looming threat to the utility grid and public safety.⁸ Many thousands of these meters have been recalled.⁹

By contrast, electromechanical analog utility meters have been in place in the United States for decades. They have been the subject of few, if any, reported complaints or unsafe incidents. Analog meters contain no ignitable or energy consuming *electronic*¹⁰ components. Analog meters protect privacy and pose no cyber-security breach risks. Analog meters have no history of being recalled.

MISSING SAFETY FEATURES RAISE RED FLAGS ON METER SCHEME

Surge Arrestors

Missing from electronic meters are adequate surge arrestors¹¹. Surge arrestors protect the electrical system and electronics and other electrical equipment from voltage surges. This in turn prevents fires and electrical equipment damage.

Although the tiny electronic components inside electronic meters may be fitted with tiny surge arrestors, there is no evidence that these surge arrestors were designed or tested to withstand voltage surges from the utility-side electrical grid¹². Nor would these tiny surge arrestors help protect consumer-side electrical circuitry from extreme utility-side voltage surges.

By contrast, analog meters contain, among other safety features, adequate surge protection, including surge arrestors that are appropriately designed to specifically protect consumer-side electrical circuitry from the damaging effects of utility-side voltage surges. The surge arrestors inside analog meters are part of a conductive metal design that intercepts and directs utility-side electrical surges to ground before these damaging surges enter the consumer's electrical system. Thus, analog meters protect consumers' electrical circuitry.

Circuit Breakers

Another hazardous oversight in the design of electronic meters is the lack of circuit breaker protection for the electronic meter. Should the electronic meter fault, there is no circuit breaker that would stop that fault from developing into a serious fire or even explosion. All the circuit breakers in the home help protect the home from fire hazards from electrical devices within the home, but they do nothing to protect the home from a fire originating due to a fault in the electronic meter outside.

An analog electromechanical utility meter does not require a circuit breaker because it is not flammable and it is a passive device that does not draw current. Therefore, when an analog meter is in place, a consumer's main circuit breaker combined with the breakers on the circuits, in a properly designed home electrical system, are the only breakers needed to protect the home from fires caused by electrical current drawing faults.

According to the National Fire Protection Association standards, (NFPA 70: National Electrical Code (NEC), Article 240 - Overcurrent Protection - 240.4 Protection of Conductors),¹³ any device that contains electronic components would be required to be connected to a circuit breaker if it were installed downstream from the consumer's circuit breaker panel.

Voltage surges caused by malfunctioning electronic meters cause equipment failure and fires

In the event of a fault in an electronic meter, not protected by a surge arrester, a voltage surge may result, causing damage to the electrical system and electrical devices inside the house. As this damage occurs it may result in the devices overdrawing current and tripping breakers within the house. This would then appear to have been the cause of the problem, even though the real problem was a fault in the electronic meter, which progressed into a true fault situation due to the absence of a protective circuit breaker.

Utilities' Tamper with Evidence of Fires Caused by Electronic Meters

Hazardous electrical events that either originate on the utility-side distribution grid or at electronic meters are overheating and/or igniting electronic meters, sending voltage surges through breaker panels, destroying appliances and causing electrical fire conditions, which **ONLY THEN** cause the circuit breakers to trip in a back-flow response. These destroyed appliances are the symptom, not the cause of these fires.

Alarmingly, there are numerous reports of unlawful tampering with evidence by utility companies, who have removed meters after a fire has occurred and before fire inspectors can examine these devices. This has impeded investigations of fires caused by electronic meters.¹⁴ It has also led fire inspectors to blame electrical appliances for causing electrical fires, when in fact the appliances failed only after being damaged by a hazardous electrical condition that originated on the utility-side distribution grid and/or the electronic meter.

Electronic Utility Meters Were Never Tested For Electrical Fire Safety

Electronic meters were never safety tested *in-situ*, connected to utility-side distribution wiring, consumers' electric circuit panels and consumers' electrical circuitry, or the unpredictable and varying conditions that take place within these systems.¹⁵

There is no evidence that the electronic components inside electronic meters were ever tested for tolerance to extreme utility-side voltage surges, other electrical fire risks or outdoor weather conditions.

State regulators rushed to approve electronic meters based on Federal Communications Commission (FCC) Part 15 testing. This test was designed to detect interference. It was set up for wireless devices that employ power cords. This test was improper for electronic utility meters because an electronic meter does not employ a power cord. Instead of developing proper testing for electronic utility meters, the FCC-accredited workers altered the electronic meter by fastening a power cord to it. They altered the meter to fit a test modality that was not designed for utility meters. This laboratory set-up, in isolated conditions, failed to include utility-side wiring, consumers' circuit breaker panels, consumers' electrical circuitry and real-life electrical events like voltage surges. Together the colossal system design failures and negligent testing oversights have resulted in suffering and loss of life and property.

Electronic Meters Are Not Underwriter's Laboratory Approved

All of these facts demonstrate gross negligence, if not recklessness or even willful misconduct, by the designers of electronic meters and the utility companies that are installing them, as well as the government regulators, including the FCC, that rushed to approve faulty meters before any safety testing was performed. Perhaps all of the risks associated with electronic meters explain why Underwriter's Laboratories has not approved them.

Conclusion

In the mid-2000s, utility companies, government regulators and several large environmental groups dispensed with essential public health, safety, privacy and security considerations to embrace electronic utility meter technology that has no proven consumer or environmental benefits.

The majority of the public is unaware that they are paying for electronic meters that cause fires, electrical problems, radiofrequency radiation emissions, privacy breaches and cyber-security risks. They do not know that utility companies, government regulators and some environmental groups are actively promoting dangerous utility meter technology that is destroying lives and properties.

Electronic meters should have never been approved and now they must be recalled.

In the meantime, consumers must assert their right to protect themselves by refusing electronic meters and accepting only analog meters without any fees or penalties.

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¹ Dictionary of Construction - Definition of Surge Arrestors:
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² Dictionary of Construction - Definition of Circuit Breakers:
<http://www.dictionaryofconstruction.com/definition/circuit-breaker.html>

³ Stop Smart Meters: Man Dies in Dallas House Fire Attributed to Oncor Smart Meter
<http://stopsmartmeters.org/2015/02/04/man-dies-in-dallas-house-fire-attributed-to-oncor-smart-meter/>

⁴ Smart Meter Awareness: The Health Argument Against Wireless Smart Meters
<https://smartgridawareness.org/2014/04/20/the-health-argument-against-wireless-smart-meters/>

⁵ Smart Meter Fires:

Testimony of Norman Lambe— Insurance and "Smart" Meter Fires:
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Big Rig Crash Into Pole Leads to Power Surge in Discovery Bay

<http://abc7news.com/big-rig-crash-into-pole-leads-to-discovery-bay-power-surge/2571617/>

⁶ Nerve Disrupting Frequencies Radiation from "Smart" Meters

<https://www.youtube.com/watch?v=4NTSejgsjTc>

⁷ Smart Grid Awareness: Smart Meter Privacy Invasion ALERT

<https://smartgridawareness.org/2014/05/16/smart-meter-privacy-invasion-alert/>

⁸ Smart Grid Awareness: Puppet Attack: Newly Discovered Cyber Security Threat for Smart Meters

<https://smartgridawareness.org/2016/01/13/puppet-attack-new-cyber-threat-for-smart-meters/>

⁹ Smart Meter Recalls:

Smart Meter Recall Cost Balloons to \$47 M, SaskPower says...

<http://www.cbc.ca/news/canada/saskatchewan/smart-meter-recall-cost-balloons-to-47-m-saskpower-says-1.2724304>

More Fires, More Smart Meter Recalls For Sensus

<https://www.greentechmedia.com/articles/read/more-fires-more-smart-meter-recalls-for-sensus>

¹⁰ Oxford Dictionary - Definition of *Electronic*: (Of a device) having or operating with the aid of many small components, especially microchips and transistors, that control and direct an electric current.

¹¹ May 22, 1973 - US Patent Overvoltage Surge Arrestor for a Meter

<http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=%2Fnetahtml%2FPTO%2Fsrchnum.htm&r=1&f=G&l=50&s1=3735259.PN.+A000000.PN.&OS=PN/3735259+OR+PN/A000000&RS=PN/3735259+OR+PN/A000000>

¹² Stockton Smart Meters Explode After Truck Causes Power Surge

<http://sacramento.cbslocal.com/2015/03/30/stockton-smart-meters-explode-after-truck-causes-power-surge/>

¹³ National Fire Protection Association:
<http://www.nfpa.org/codes-and-standards>

¹⁴ Smart Grid Awareness: Utilities Remove Burned Smart Meter Evidence from Fire Scenes
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¹⁵ Stop Smart Meters NY: The Isotope Report:
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