

Comment on HHS Request for Information: Conducted Electromagnetic Emissions and Residential Metering

Sean Polacik · October 19, 2026

To: U.S. Department of Health and Human Services, Office of the Assistant Secretary for Health **Docket:** HHS-OASH-2026-0397 — Request for Information on Electromagnetic Fields (EMFs), Radiofrequency (RF) Radiation, and Wireless Radiation Exposure **From:** Sean Polacik, Ohio

Perspective (Q2): Consumer and technical practitioner. I worked as an instrumentation and electrical technician from 2004 to 2021 in the oil and gas and pharmaceutical industries, including work in hazardous (Class I, Division 2) locations, where bonding, grounding and noise control are safety requirements. This comment relies on peer-reviewed research, government and standards documents, independent laboratory test reports, and my own field measurements, each identified below. It responds to Questions 3, 5, 7, 8, 9, 13, 16, 17 and 18.

Summary

The RFI's scope includes "low radiofrequency associated with power systems and household appliances." Within that range, one residential exposure is almost entirely unmeasured and unregulated: high-frequency noise voltage conducted on household wiring in the 2–150 kHz band, produced by switch-mode power supplies, LED drivers, inverters and the electronic utility meter itself. Federal conducted-emission limits begin at 150 kHz, so devices may emit freely below it, and the meter accuracy standard does not require residential meters to tolerate it.

I ask HHS to:

1. Recognize conducted 2–150 kHz noise and power-frequency magnetic fields from wiring errors as distinct residential exposures in any EMF exposure framework (Q5, Q8).
2. Coordinate with the FCC and standards bodies to close the 2–150 kHz emission-limit gap (Q5, Q17).
3. Fund a standardized measurement method and blinded, independently replicated health studies of this band (Q7, Q16).

Q3: My experience

I offer this as one person's observational account, not as proof of cause, with the limits stated below.

- **Medical evaluation:** in a letter dated August 29, 2024, my endocrinologist documented electromagnetic sensitivity, with palpitations, arrhythmia, headache and severe fatigue near sources such as smart meters, Wi-Fi and cell phones, resolving away from exposure. She recommended exposure avoidance as the treatment. A copy is available to HHS on request.
- **Exposure reduction:** in July 2024, on her recommendation, I removed all wireless equipment from my home (it is now wired-only), and I installed power-line filtering at the noisiest sources: inverter appliances and the switching power supplies in a red-light therapy panel I rewired and filtered.
- **What changed:** my health-system records show 18 emergency department visits in the 10 months from September 2023 to June 2024 (about 1.8 per month). In the 16 months after the changes, July 2024 to October 2025, I had one emergency visit and one three-day admission (about 0.1 per month). Around November 2025 a household member began using a new smartphone at a desk against the other side of my bedroom wall, where my consumer RF meter showed peak readings around 3 W/m². Cellular signal inside my home is weak: the 1950s house has foil-faced sheathing under the siding, which I saw when the siding was removed for wall insulation. It blocks outside signal, so phones indoors transmit at higher power, and it reflects their transmissions back inside. From November 2025 to August 2026 I had 12 emergency visits (about 1.2 per month), despite adding foil shielding to that wall. The other person moved out in October 2026.
- **Limits:** this was not blinded, I knew when exposure changed, other factors in my life and treatment changed over the same period, and a single case cannot establish cause. The pattern of improvement on removal and relapse on re-exposure is worth testing properly, not proof by itself. That is why I support the blinded, measured-exposure studies recommended below.

My field measurements of conducted noise in my home are described under Q5–Q8.

Q5, Q7, Q8: Standards and measurement gaps

Emission limits stop at 150 kHz. FCC Part 15 (47 CFR 15.107) and the international equivalents (CISPR 11 / EN 55011, CISPR 32) limit conducted emissions on power lines only from 150 kHz to 30 MHz. The 2–150 kHz band, often called supraharmonics, is where switching electronics emit most strongly, and it is effectively unregulated for emissions.

Meters emit in that band. Bench tests commissioned in 2021 measured conducted noise from two European smart meters using a line impedance stabilization network and the CISPR 16 method [5, 6]. An Aidon 6525 meter produced about 80–100 dBμV between roughly 1 and 60 kHz while complying with the limits above 150 kHz. A Kamstrup Omnipower peaked near 67 dBμV at 1–30 kHz. The lab was not an accredited EMC lab and the tests were commissioned by litigants, so the results warrant independent replication.

My own field measurement agrees. With every branch breaker off except one dedicated circuit, I measured high-frequency line voltage with a Greenwave broadband meter while the utility swapped meters. Readings averaged 550 mV (range 528–572) with the digital meter (Itron Centron II), 508 mV (499–536) with an electromechanical meter, and returned to the original range when the digital meter was reinstalled. The digital meter's power supply added about 8% to the line's noise with no household load present [7].

Accuracy standards ignore it. ANSI C12.1-2022 tests meters on supplies with no more than 2% harmonic distortion, and clause 4.7.4 exempts non-Blondel meter forms, including the Form 2S used on most U.S. homes, from harmonic testing [8]. University of Twente tests found static meters misreading by –32% to +582% under realistic household noise [1, 2], and NIST built a dedicated testbed because clean-sine type testing does not represent field conditions [3].

Exposure is not routinely measured. Consumer meters report this band in inconsistent units (millivolts, "GS units"), and a systematic review found no validated exposure metric or threshold [4]. Exposure assessment should include a standardized method for conducted 2–150 kHz voltage and for the electric and magnetic fields it produces in occupied rooms, referenced to the ICNIRP 1 Hz–100 kHz guidelines [9].

Q9, Q13: Cumulative household exposure and disclosure

Smart meters add a conducted source as well as a radio source. Q13 lists communication-enabled smart meters as an RF source. Their switch-mode power supplies are also a continuous conducted source, and opting out of the radio does not remove it.

That noise adds to the noise from LED lighting, chargers, variable-speed appliances and inverters already on the same wiring.

Wiring errors raise power-frequency magnetic fields. Shared or borrowed neutrals, neutral-to-ground bonds downstream of the service panel, and current returning on water pipes create net currents and elevated 60 Hz magnetic fields throughout a home. The same mechanism, neutral current times neutral resistance, produces the stray voltage documented on dairy farms, where cows react at about 2 mA of 60 Hz current [13]. Filters installed on miswired circuits can raise local fields rather than lower them.

What should be disclosed (Q9):

- **Meter manufacturers and utilities:** conducted emissions from 2 kHz to 30 MHz for each deployed meter model, measured by an accredited lab, and whether opt-out models differ.
- **Product labels:** conducted emissions below 150 kHz for switching power supplies, LED drivers and inverter appliances.
- **Utilities:** how to request a check of service neutral integrity and stray voltage, and the opt-out options available, including electromechanical meters where permitted.

Q16: The health evidence is a research gap, not a settled answer

The evidence on these low-frequency household exposures is mixed, and the gaps are specific enough to fund:

- **Power-frequency magnetic fields.** Pooled analyses found childhood leukemia risk about doubled above 0.4 μT [10], with a weaker, imprecise association in newer studies [11]. IARC classifies these fields as possibly carcinogenic (Group 2B) [12]. No mechanism is established, and the one direct test of the contact-current hypothesis found no association [17].
- **High-frequency noise voltage ("dirty electricity").** A school cancer cluster was associated with high-frequency voltage transients but not 60 Hz fields [16]. A systematic review concluded the evidence does not yet meet scientific standards, mainly because studies were unblinded, small and used an arbitrary metric [4].
- **Reported sensitivity.** Clinical cohorts report inflammatory and oxidative-stress biomarkers in people who report electromagnetic sensitivity [15]. Blinded provocation studies have not shown that participants can detect exposure above chance [14].

The common weakness is exposure assessment: almost no health study has measured conducted 2–150 kHz exposure with a validated method. That is the gap HHS can close.

Q16, Q17, Q18: Recommendations

1. **Define the exposure.** Include conducted 2–150 kHz voltage, and the fields it produces indoors, as a named residential exposure in any HHS EMF framework, separate from radiated RF.
2. **Fund a measurement standard.** Have NIST, working with NIOSH, develop a validated method and reporting units for household conducted noise, building on NIST's existing smart-meter testbed [3].
3. **Run a residential survey.** Measure conducted noise, power-frequency magnetic fields and service neutral integrity in a representative sample of U.S. homes, before and after smart-meter installation.
4. **Fund blinded, replicated health studies** using that method: double-blind filter-on/filter-off crossover trials, and cohorts with measured, not self-reported, exposure.
5. **Coordinate with the FCC and standards bodies (Q17).** Support extending Part 15 conducted-emission limits below 150 kHz, and adding realistic distorted-waveform tests to ANSI C12.1, including for Form 2S meters.
6. **Prioritize wiring safety.** Promote low-cost checks of neutral integrity and grounding; correcting wiring errors reduces magnetic-field exposure and shock hazard at the same time.

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Attachment: redacted physician letter of August 29, 2024 (personal identifiers removed).