

**INTERROGATORIES AND REQUESTS FOR PRODUCTION OF DOCUMENTS  
PROPOUNDED BY COMPLAINANTS ON PPL ELECTRIC UTILITIES CORPORATION  
— SET II**

Pursuant to 66 Pa.C.S. § 333 and 52 Pa. Code §§ 5.341 et seq., Complainants propound the following Interrogatories and Requests for Production of Documents PPL Electric Utilities Corporation (“Respondents”) — Set II.

Please provide answers to this discovery request within twenty (20) days of the date of service, pursuant to 52 Pa. Code § 5.342.

Complainants to PPL:

**I-1.** In support of its position in the instant case, does PPL assert or make the claim that radiofrequency radiation at power densities which are *below* the FCC's current safety guidelines cannot, do not, could not, and will not cause or increase the risk of biological or adverse health effects?

**I-2.** In support of its position in the instant case, does PPL assert or make the claim that radiofrequency radiation at specific absorption rate (SAR) levels which are below the FCC's current safety guidelines cannot, do not, could not, and will not cause or increase the risk of biological or adverse health effects?

**I-3.** If PPL's answer to I-1 or I-2 is in the affirmative, please identify specifically all evidence upon which PPL relies for support of such claims, citing all and **only** peer-reviewed scientific research which was fully independent and completely without conflicts of interest and which excludes studies that were funded, in whole or in part, by wireless technologies and related industries.

**I-4.** Of all the peer-reviewed scientific research studies cited in PPL's response to I-3 that reported negative or inconclusive results, please indicate specifically which, if any, PPL would purport to completely counter, negate or nullify the positive findings of one or more peer-reviewed scientific research studies that have reported biological and/or adverse health effects from RF exposure.

**I-5.** Of all the peer-reviewed scientific research studies cited in PPL's response to I-4, please identify **only** those, if any, which were genuine attempts to replicate the positive findings of some prior research study and which faithfully and precisely followed all methodological and design protocols of the modeled positive study, but which nonetheless obtained negative or inconclusive results.

**I-6.** Does PPL assert that the FCC presently claims, or that the FCC has ever claimed, that the FCC's RF exposure guidelines protect human beings not only from effects of a thermal mechanism, but also are protective from harm by **any and all** other possible mechanisms?

**I-7.** Does PPL assert that the FCC presently claims, or that the FCC has ever claimed, that exposure to radiofrequency radiation is safe with regard to physiological changes by physical processes other than heating, acute burning, or electric shock?

**I-8.** If PPL's response to I-6 or I-7 is in the affirmative, please concisely state by citing the evidentiary, factual basis which PPL intends to put forth to **conclusively** establish such claims.

**I-9.** Does PPL itself assert or claim that the FCC's current safety guidelines setting permissible levels of exposure to radiofrequency radiation are protective against **all possible mechanisms** of interaction between RF and biological systems?

**I-10.** If PPL's answer to I-9 is in the affirmative, please identify all scientific research studies and concisely state all objective facts which PPL alleges and intends to put forth as **conclusive** evidence in support of its claim.

**I-11.** Does PPL assert or claim that the FCC's current RF exposure guidelines apply to, and are protective in, chronic, non-thermal exposure situations?

**I-12.** If PPL's answer to I-11 is in the affirmative, please identify and concisely state all scientifically established facts and objective evidence which PPL alleges and intends to put forth as **conclusive** evidence in support of that claim.

**I-13.** Does PPL assert or claim that its AMI wireless smart meter devices are safe primarily because they are compliant with the Federal Communications Commission's radiofrequency (RF) exposure standards?

**I-14.** Does PPL assert or claim that biological and/or adverse health effects do not, and cannot, occur as a result of exposure to RF at levels below the FCC safety guidelines?

**I-15.** If PPL's answer to I-14 is in the affirmative, please identify and concisely state all scientifically established facts and objective evidence which PPL alleges and intends to put forth as **conclusive** evidence in support of that claim.

**I-16.** Does PPL assert or claim that it is not reasonable to doubt that chronic, day-and-night, long-term exposure to the radiofrequency radiation and RF electromagnetic fields produced by wireless smart meters is safe?

**I-17.** If PPL's answer to I-16 is in the affirmative, please concisely and fully state the basis and reasons for such a claim.

**I-18.** Please identify and concisely state all scientifically established facts and objective evidence which PPL alleges and intends to put forth as **conclusive** evidence that **chronic, continual, day-and-night, long-term exposure** to radiofrequency radiation is safe.

**I-19.** Please identify and concisely state all scientifically established facts and objective evidence which PPL alleges and intends to put forth as **conclusive** evidence that chronic, continual, day-and-night, long-term exposure to modulated radiofrequency radiation is safe.

**I-20.** Please identify and concisely state all scientifically established facts and objective evidence which PPL alleges and intends put forth as **conclusive** evidence that chronic, continual, day-and-night, long-term exposure to highly pulsed radiofrequency radiation is safe.

**I-21.** Please identify and concisely state all scientifically established facts and objective evidence which PPL alleges and intends to put forth as **conclusive** evidence that chronic, continual, day-and-night, long-term exposure to RF electromagnetic fields is safe.

**I-22.** Please identify and concisely state all scientifically established facts and objective evidence which PPL alleges and intends to put forth as **conclusive** evidence that chronic, continual, day-and-night, long-term exposure to radiofrequency radiation and/or RF electromagnetic fields produced by wireless smart meter devices is safe.

**I-23.** Please identify and concisely state all scientifically established facts and objective evidence which PPL alleges and intends to put forth as **conclusive** evidence that chronic, continual, day-and-night, long-term exposure to highly-pulsed, modulated radiofrequency radiation and/or RF electromagnetic fields at levels produced by its wireless smart meter devices is safe.

**I-24.** Please identify and concisely state all scientifically established facts and objective evidence which PPL alleges and intends to put forth as **conclusive** evidence that chronic, continual, day-and-night, long-term exposure to highly pulsed, modulated radiofrequency radiation produced in aggregate by PPL's wireless mesh network is safe.

**I-25.** Does PPL assert or claim that there is no **risk or increased risk** of biological or adverse health effects associated with 'sub-thermal' or 'non-thermal' levels of exposure to radiofrequency radiation and/or RF electromagnetic fields?

**I-26.** If PPL's answer to I-25 is in the affirmative, please identify and concisely state all scientifically established facts and objective evidence which PPL alleges and intends to put forth as **conclusive** evidence in support of that claim.

**I-27.** Does PPL assert or claim that 'sub-thermal' or 'non-thermal' levels of radiofrequency radiation and/or RF electromagnetic fields are not, and cannot be, a biological hazard?

**I-28.** If PPL's response to I-27 is in the affirmative, please identify and concisely state all scientifically established facts and objective evidence which PPL alleges and intends to put forth as **conclusive** evidence in support of that claim.

**I-29.** Does PPL assert or claim that 'sub-thermal' or 'non-thermal' levels of radiofrequency radiation and/or RF electromagnetic fields are not, and cannot be, a carcinogenic hazard?

**I-30.** If PPL's response to I-29 is in the affirmative, please identify and concisely state all scientifically established facts and objective evidence which PPL alleges and intends to put forth as **conclusive** evidence in support of that claim.

**I-31.** Does PPL assert or claim that exposure to 'sub-thermal' or 'non-thermal' levels of radiofrequency radiation and/or RF electromagnetic fields do not, cannot and could not cause **non-linear** biological effects?

**I-32.** If PPL's response to I-31 is in the affirmative, please identify and concisely state all scientifically established facts and objective evidence which PPL alleges and intends to put forth as **conclusive** evidence in support of that claim.

**I-33.** Does PPL assert or claim that the levels of radiofrequency radiation and/or RF electromagnetic fields produced by its wireless smart meter devices are negligible and "too small to matter" biologically?

**I-34.** If PPL's response to I-33 is in the affirmative, please identify and concisely state all scientifically established facts and objective evidence which PPL alleges and intends to put forth as **conclusive** evidence in support of that claim.

**I-35.** Does PPL assert or claim that any and all biological and health risks associated with exposure to 'sub-thermal' or 'non-thermal' levels of radiofrequency radiation and/or RF electromagnetic fields produced by its wireless smart meter devices are negligible and "too small to matter"?

**I-36.** If PPL's response to I-35 is in the affirmative, please identify and concisely state all scientifically established facts and objective evidence which PPL alleges and intends to put forth as **conclusive** evidence in support of that claim.

**I-37.** Does PPL assert or claim that it is possible to assign a low intensity limit or threshold below which RF exposures are without effect?

**I-38.** If PPL's answer to I-37 is in the affirmative, please identify and concisely state all scientifically established facts and objective evidence which PPL alleges and intends to put forth as **conclusive** evidence in support of that claim.

**I-39.** Is PPL aware of any established empirical standard of safety whatsoever that can be objectively applied to decide questions of safety of radiofrequency radiation at exposure levels that are alleged to produce or cause non-thermal biological effects?

**I-40.** Please identify any and all scientific safety studies of which PPL is aware as being studies that have specifically investigated wireless smart meters with regard to biological and/or adverse health effects.

**I-41.** Please identify any and all scientific safety studies *specifically* of wireless smart meters that have established conclusive evidence that low-level, modulated radiofrequency radiation, conducted emissions, and/or RF electromagnetic fields produced by or resulting from these devices do not cause, and are not capable of causing, biological or adverse health effects.

**I-42.** If PPL asserts or claims that its AMI wireless smart meters and network facilities are completely safe, please state whether the safety that PPL alleges has been established on the basis of studies done specifically on its smart meter devices and network facilities themselves.

**I-43.** In a prior case brought before the Pennsylvania Public Utility Commission, Dr. Mark Israel "testified that there is no reliable medical basis to conclude that radio frequency fields associated with AMI devices could cause, contribute to or aggravate any adverse health effects." (*Susan Kreider v. PECO Energy.*)

If PPL concurs with that testimony by Dr. Israel, please identify and concisely state all scientifically established, biomedical facts and objective evidence which PPL alleges and intends to put forth as a **conclusive and reliable** medical basis for such a claim.

**I-44.** PPL is on record as having put forth the argument attesting that:

"RF fields are part of the lower energy, non-ionizing portion of the electromagnetic spectrum which consists of lower frequency signals that do not have enough energy to break chemical bonds in cells or DNA. PPL Electric Statement No. 1 at 5-6." (*Alan V. Schmukler v. PPL Electric Utilities Corporation*, Findings of Fact No. 47.)

Please identify and concisely state all scientifically established facts and objective evidence which PPL alleges and intends to put forth as **conclusive** evidence that:

- (1) its **assumption** that non-ionizing, RF radiation does not have enough energy to break chemical bonds in DNA is true in fact, and
- (2) the implied inference, that RF radiation and fields cannot damage DNA, is also true in fact.

**I-45.** "PPL contends radiofrequency fields are **always** non-ionizing, **non-carcinogens**. PPL Electric Statement No. 1 at 16-17." (See *Schmukler v. PPL Electric Utilities Corporation.*) (Emphasis added.)

Please identify and concisely state all scientifically established, biomedical facts and objective evidence which PPL alleges and intends to put forth as **conclusive** evidence in support of such a claim.

**I-46.** Does PPL assert or claim that non-ionizing radiation cannot cause cancer or other health effects other than tissue heating?

**I-47.** If PPL's answer to I-46 is in the affirmative, please identify and concisely state all scientifically established facts and objective evidence which PPL alleges and intends to put forth as **conclusive** evidence in support of that claim.

**I-48.** Does PPL dispute the determination by the International Agency for Research on Cancer (IARC) that there is sufficiently strong evidence to support a conclusion that there is increased risk of cancer associated with exposure to non-ionizing, radiofrequency radiation?

**I-49.** Does PPL dispute the findings, published in the triple-peer-reviewed, final report of the U.S. NIH/NIEHS/National Toxicology Program, of "**clear evidence**" of causation of certain cancers by exposure to non-ionizing, radiofrequency radiation?

**I-50.** Does PPL dispute the findings, published in the triple-peer-reviewed, final report of the U.S. NIH/NIEHS/National Toxicology Program, of DNA damage to brain cells of test animals exposed to non-ionizing, radiofrequency radiation?

**I-51.** If PPL's response to any of I-48 , I-49 or I-50 is in the affirmative, please fully and concisely state the basis and reasons for any such dispute(s).

**I-52.** PPL is on record as having put forth the claim attesting that:

"IEI and the variety of symptoms attributed to it are not caused by exposure to RF fields. PPL Electric Statement No. 2 at 9-11." (*Alan V. Schmukler v. PPL Electric Utilities Corporation*, Findings of Fact No. 70.)

As the term 'idiopathic' means 'of unknown cause', please state precisely how PPL, or anyone, can be certain that any of the variety of symptoms attributed to IEI are not, and could not be, caused by environmental exposure to RF radiation and/or RF fields. Also, please identify all scientific research and concisely state all scientifically established, biomedical facts and objective evidence which PPL alleges and intends to put forth as **conclusive** evidence in support of such a claim.

**I-53.** PPL is on record as having put forth the following claim, attesting that:

"The new smart meter does not generate electrical power, does not produce additional harmonics over and above what is already coming into the meter, and does not interfere with the operation of house wiring. C Exhibit 26, Tr. 41-42, 55-74, 102, PPL Electric Statement No. 1 at 11" (*Alan V. Schmukler v. PPL Electric Utilities Corporation*, Findings of Fact No. 57.)

As a 'switching mode power supply' (SMPS) is a standard component in every AMI wireless smart meter, please verify and provide all information and device characteristics data which PPL alleges and intends to put forth as conclusive evidence in support of its claim that high-frequency voltage transients (harmonics) are not produced by the operation of its smart meters, and in particular, by the operation of the SMPS in each of its smart meters. Moreover, please provide all information which PPL alleges and intends to put forth as conclusive evidence in support of the claim that its smart meters do not themselves, as a result of their operation, introduce high-frequency voltage transients, or harmonics, into house wiring.

**I-54.** Please state whether, in **any** proceeding upon the motion of the Pennsylvania Public Utility Commission, PPL has **ever** been required, pursuant to 66 PA.C.S. §315 (c), to prove or show specifically that its wireless smart meter devices and facilities are in fact safe.

**I-55.** If PPL's answer to I-54 is in the affirmative, please precisely identify the particular proceeding and state the date on which such proceeding officially took place. Please also describe in detail exactly how and upon what evidence in particular PPL met its burden of proof of the safety of its wireless smart meter devices and facilities.

**I-56.** Please state whether, in **any** proceeding upon the motion of the Pennsylvania Public Utility Commission, PPL has **ever** been required, pursuant to 66 PA.C.S. §315 (c), to prove or show specifically that its wireless smart meter mesh network in aggregate is in fact safe.

**I-57.** If PPL's answer to I-56 is in the affirmative, please precisely identify the particular proceeding and state the date on which such proceeding officially took place. Please also describe in detail exactly how and upon what evidence in particular PPL met its burden of proof of the safety of its wireless smart meter mesh network in aggregate.

**I-58.** Please state whether PPL's AMI wireless smart meters physically exceed the specified limits established by the FCC for Class A and Class B devices with regard to conducted emissions.

**I-59.** UL 2735 compliance is **not** the same as 'UL 2735 Listed'. UL compliance means that the individual components of a device are sourced from manufacturers that have obtained 'UL Listed' status, but that the device as a whole is not necessarily 'UL Listed'.

Please state whether or not the Landis+Gyr AMI smart meters deployed by PPL are 'UL 2735 **Listed**'.

**I-60.** Please state whether, as new applications and functionality are added to the communication modules in PPL's wireless smart meters in the future, the meters' duty cycles will increase correspondingly.

**I-61.** Please state whether the transmission frequency of PPL's AMI wireless smart meters within its mesh network can vary substantially. Please also state whether variation in transmission frequency can depend largely on the locations of the meters within the network.

**I-62.** Please state whether the transmission frequency of PPL's AMI wireless smart meters can or will vary according to their relative locations or distances from other meters or data communication facilities in PPL's mesh network.

**I-63.** Please state whether or not the transmission frequency and RF field density and emission characteristics of PPL's AMI wireless smart meters have been independently tested such that the numerical values previously provided by PPL for these characteristics have been independently verified.

**I-64.** Please state whether PPL can assert with certainty that its AMI wireless smart meters and smart meter technology do not constitute a hazard to public health and safety.

**I-65.** Please state whether PPL can assert with certainty that its AMI wireless smart meters and smart meter technology are without potential risk to public health and safety.

**I-66.** Please state whether PPL can assert with certainty that its AMI wireless smart meters and smart meter technology are without significant and substantive risk and/or increased risk to public health and safety.

**I-67.** Please state whether PPL can assert with scientific certainty that the risk to public health and safety posed by its AMI wireless smart meters and smart meter networks is negligible or too small to matter.

**I-68.** Please state whether PPL has ever assessed the impact upon public health and safety of the increased aggregate environmental RF radiation burden resulting from added exposure to its wireless smart meter mesh network.

**I-69.** Please state whether a public health and safety impact study of PPL's AMI wireless smart meters and smart meter technology has ever been conducted by any official agency of the Commonwealth of Pennsylvania or by anyone else either before, during, or after the Commission-mandated, statewide implementation and deployment of this technology.

**I-70.** In accordance with 52 Pa. Code § 57.28(a)(1): "An EDC must use reasonable efforts **to properly warn and protect** the public from danger and to exercise reasonable care to reduce the hazards to which customers may be subjected to by reason of the EDC's provision of electric utility service and its associated equipment and facilities."

Please state whether PPL has ever informed the public of the hazards, risks, potential risks, or increased risks to public health and safety associated with its AMI wireless smart meters and smart meter technology.

**I-71.** Please state whether the Pennsylvania Public Utility Commission has ever informed the public of the hazards, risks, potential risks, or increased risks to public health and safety associated with PPL's AMI wireless smart meters and smart meter technology.

**I-72.** Please state whether the State of Pennsylvania or any official agency of the State has ever informed the public of the hazards, risks, potential risks, or increased risks to public health and safety associated with PPL's deployment and operation of AMI wireless smart meters and smart meter technology.

**I-73.** Please specify precisely what customer data points are measured, calculated, collected, stored, and transmitted by PPL's wireless smart meter devices. Also, please provide a complete, detailed listing of all such data points broken down according to these categories.

**I-74.** Please state whether PPL has fully and properly informed customers and the public of the risks to

their privacy and data security through the sophisticated collection, transmission, use and/or potential use of their electricity consumption data by means of PPL's wireless smart meter devices and technology.

**I-75.** Please state whether the Pennsylvania Public Utility Commission has fully and properly informed the public of the risks to their privacy and data security through the sophisticated collection, transmission, use and/or potential use of their electricity consumption data by means of PPL's wireless smart meter devices and technology.

**I-76.** Please state whether or not the Pennsylvania Public Utility Commission is authorized to impose a sanction or penalty upon PPL if PPL were to not install wireless smart meters on the homes of customers who do not consent to them.

**I-77.** If PPL's answer to I-76 is in the affirmative, please specify in detail the nature of any such sanction or penalty.

**I-78.** Please state whether or not the imposition of a sanction or penalty upon PPL, if PPL were to not install wireless smart meters on the homes of customers who do not consent to them, is discretionary on the part of the Pennsylvania Public Utility Commission.

**I-79.** If PPL's answer to I-78 is in the affirmative, please specify in detail the nature of any such sanction or penalty.

**I-80.** Please state whether or not Pennsylvania law requires that a specific sanction or penalty be imposed upon PPL Electric Utilities by the Pennsylvania Public Utility Commission if PPL were to not install wireless smart meters on the homes of customers who do not consent to them.

**I-81.** If PPL's answer to I-80 is in the affirmative, please specify in detail the nature of any such sanction or penalty.

**I-82.** Please identify each person PPL plans to call as a fact witness in this proceeding. For each person, please:

- (a) Provide the person's name, home and business address, background, and qualifications;
- (b) Explain in detail the subject matter(s) on which the witness is expected to testify; and
- (c) Provide the source(s) of information relied upon or referenced by the witness.

**I-83.** Please identify each person PPL plans to call as an expert witness in this proceeding. For each person, please:

- (a) Provide the person's name, home and business address, background, and qualifications;
- (b) Explain in detail the subject matter(s) on which the witness is expected to testify;
- (c) Provide the source(s) of information relied upon or referenced by the witness; and
- (d) Provide a copy of the expert witness's current curriculum vitae.

**I-84.** Please provide copies of all exhibits PPL intends to present or utilize at the evidentiary hearing in this proceeding. For each exhibit to be used as part of PPL's direct case, please identify the witness who will be sponsoring the exhibit.

**CERTIFICATE OF SERVICE**

We hereby certify that true and correct copies of *Interrogatories and Requests for Production of Documents Propounded by Complainants on PPL Electric Utilities Corporation - Set II*, have been served upon the following persons in the manner indicated, in accordance with the requirements of 52 Pa. Code § 1.54 (relating to service by a participant):

**VIA USPS CERTIFIED MAIL**

**(7019 0700 0001 3095 0930)**

Kimberly A. Klock, Esq.  
Michael J. Shafer, Esq.  
PPL Services Corporation  
Two North Ninth Street  
Allentown, PA 18101

**(7019 0700 0001 3095 2774)**

Devin T. Ryan, Esq.  
Garrett P. Lent, Esq.  
Post & Schell PC  
17 North 2<sup>nd</sup> Street  
12th Floor  
Harrisburg, PA 17101-1601

**(7019 0700 0001 3095 2811)**

Curtis Renner, Esq.  
1901 Pennsylvania Ave NW  
Suite 1005 ENS  
Washington, DC 20006

**(7019 0700 0001 3095 2828)**

Administrative Law Judge Elizabeth Barnes  
400 North Street  
Harrisburg, PA 17120

Date: September 21, 2019

