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September 17, 2018

VIA ELECTRONIC FILING

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor North
P.O. Box 3265
Harrisburg, PA 17105-3265

Re: Richard N. Myers v. PPL Electric Utilities Corporation
Docket No. C-2017-2620710

Dear Secretary Chiavetta:

Enclosed for filing are the Replies of PPL Electric Utilities Corporation to the Exceptions of Richard N. Myers in the above-referenced proceeding. Copies will be provided as indicated on the Certificate of Service.

Respectfully submitted,

Devin Ryan

DTR/jl
Enclosures

cc: Honorable Elizabeth Barnes
Certificate of Service
Office of Special Assistants (*via e-mail*)

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing has 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 E-MAIL & FIRST CLASS MAIL

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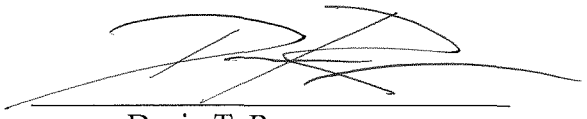
Date: September 17, 2018



Devin T. Ryan

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Richard N. Myers,	:	
	:	
Complainant,	:	
	:	
v.	:	Docket No. C-2017-2620710
	:	
PPL Electric Utilities Corporation,	:	
	:	
Respondent.	:	

REPLIES OF PPL ELECTRIC UTILITIES CORPORATION TO THE EXCEPTIONS OF RICHARD N. MYERS

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Date: September 17, 2018

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I. INTRODUCTION

PPL Electric Utilities Corporation ("PPL Electric" or the "Company"), pursuant to 52 Pa. Code § 5.535, hereby respectfully submits these Replies to the Exceptions of Richard N. Myers ("Complainant"). In the Initial Decision ("ID"), Administrative Law Judge Elizabeth H. Barnes (the "ALJ") dismissed the Complainant's Formal Complaint challenging the Company's installation of new advanced metering infrastructure ("AMI") meters at his premises and his rental properties. The ALJ correctly held that the Complainant failed to prove by a preponderance of evidence that the installation of the AMI meters constitutes unsafe or unreasonable service under 66 Pa. C.S. § 1501.

On September 5, 2018, the Complainant filed Exceptions to the ID, and PPL Electric filed a limited Exception to the ID regarding the fire safety recommendations made by the ID.

As explained herein, the Complainant's Exceptions are without merit and should be denied. Accordingly, the Company respectfully requests that the Pennsylvania Public Utility Commission ("Commission") deny the Complainant's Exceptions and adopt the ID as modified consistent with PPL Electric's limited Exception.

II. REPLIES TO EXCEPTIONS

A. REPLIES TO EXCEPTIONS NOS. 1, 2, 15, AND 16 – THE ALJ CORRECTLY FOUND THAT THE COMPLAINANT'S EVIDENCE FAILED TO PROVE THAT NON-THERMAL RADIOFREQUENCY (RF) FIELDS FROM AN AMI METER CAN CAUSE OR CONTRIBUTE TO ADVERSE HEALTH EFFECTS

The Complainant contests the ALJ's finding that he failed to prove that the non-thermal radiofrequency ("RF") fields from the new AMI meters can cause or contribute to adverse health effects. (Exceptions at 1-7, 18) As alleged support, the Complainant cites the 4,266 studies referenced in Complainant's Exhibits 3 through 5 as well as the 407 studies he cited in Appendix A in his Main Brief, and claims – in his non-expert opinion – that they show non-thermal RF

fields produce adverse health effects. (Exceptions at 1-7) The Complainant also alleges that the Company has only cited 10 studies showing that there are no adverse health effects from non-thermal radiation. (Exceptions at 1-5) As a result, the Complainant believes that he should prevail because he cited more studies. Further, the Complainant disputes the ALJ's finding that his Exhibits 3 through 5 did not provide a reliable scientific basis for reaching a conclusion about the AMI meters being used by PPL Electric, even though the studies cited in those documents did not concern AMI meters. (Exceptions at 3-7) Moreover, according to the Complainant, the ALJ and the Commission may lack the expertise to adequately assess and evaluate the scientific research on these issues. (Exceptions at 4, 6-7) Lastly, the Complainant avers that his studies with "positive findings" of biological effects from RF fields should carry more weight than any studies with negative findings. (Exceptions at 5) All of these arguments are without merit.

First, the Complainant erroneously believes that the scientific and medical issues in this case hinge on which party claims to have the highest tally of studies they believe support their positions. (PPL RB at 9) From the Complainant's perspective, he believes he should prevail because he identified 4,266 studies in Complainant's Exhibits 3 through 5 and 407 studies in Appendix A of his Main Brief. (Exceptions at 1-7) However, what actually matters is the credibility of the expert evaluations of the body of scientific research. (PPL RB at 9)

Here, the Company offered thorough, credible, and reliable evidence to rebut the Complainant's claims about the alleged adverse health effects of the new AMI meter. (PPL MB at 15-26) The Company presented overwhelming evidence that its expert witnesses, Dr. Christopher Davis and Dr. Mark Israel, possess exceptional qualifications and experience, that they are eminent and highly regarded in their scientific communities, and that their opinions are reliable and sound. (PPL MB at 16-17, 20-22) Dr. Davis and Dr. Israel testified at length about

their thorough and detailed evaluations of the relevant scientific information. (*See* PPL St. Nos. 1 and 2) Their evaluations of the body of scientific research and their conclusions about the lack of established biological effects and the lack of adverse health effects from low-level non-thermal RF from AMI meters are consistent with the findings of mainstream public health entities such the World Health Organization ("WHO"), which has concluded that "To date, no adverse health effects from low level, long-term exposure to radiofrequency or power frequency fields have been confirmed." (PPL RB at 10) In his written testimony, Dr. Israel provided representative examples of relevant, well-conducted studies. He expressly recognized that "In any large body of laboratory research, such as the hundreds of studies conducted on RF fields, there are likely to be some contradictory findings, with some studies reporting biological effects that cannot be replicated or confirmed in other studies by independent researchers." (PPL St. No. 2., p. 8) Similarly, Dr. Davis explained that "there are also hundreds of studies, probably thousands of studies that record no effects" from RF exposure. (Tr. 255) This expert testimony is entirely consistent with the conclusions that have been reached in recent years by multiple expert groups around the globe, federal and public health agencies in the U.S., and state public utility commissions, finding no established adverse biological or health effects from RF fields, particularly RF fields from AMI meters. (*See* PPL Exhs. MI-1, MI-2, MI-3)[1]

Second, the ALJ properly found that Complainant's Exhibits 3 through 5, which are the sources for the 4,266 studies referenced by the Complainant, do not provide a reliable scientific basis for reaching a conclusion about the AMI meters being used by PPL Electric. (ID at 20-22) As Dr. Israel pointed out, the BioInitiative Report (Complainant's Exhibit 3) is an advocacy document and not a scientific study, and it has been widely criticized for a lack of scientific

[1] Further details on the testimony of Dr. Davis and Dr. Israel on these issues can be found in Section II.L., *infra.*

objectivity and reliability. (PPL RB at 10) This same view of the BioInitiative Report as being unbalanced and unreliable has been reached by public entities that have evaluated the document. (PPL Exh. MI-4) In fact, the Complainant's own witness, Dr. Carpenter, admitted at the hearing that he was involved in creating the BioInitiative Report and that its purpose was advocacy. (PPL RB at 10-11) Dr. Carpenter admitted that the authors of the BioInitiative Report were hand-picked because they all had views known "to help support the goal of arguing for new standards." (PPL RB at 11) Because the BioInitiative Report is an advocacy document written in order to cast the science in a particular light, the report does not provide a balanced view of the scientific research. Such a conclusion has been reached by the Health Council of the Netherlands, the Texas Public Utility Commission, and many other credible agencies. (PPL RB at 11; PPL Exh. MI-4)

Likewise, Complainant's Exhibit 4 is not a scientific study published in a peer-reviewed scientific journal; rather, it is merely a list of various studies. (PPL RB at 12) In addition, Exhibit 4 clarifies that any "effects are listed without comment or endorsement since the literature abounds with conflicting reports. In some cases the basis for reporting an 'effect' was a single or a non-statistical observation which may have been drawn from a poorly conceived (and poorly executed) experiment." (Complainant's Exhibit 4, p. 7) Further, the Complainant's assertion that the studies listed in Exhibit 4 evaluated non-thermal effects from low level RF exposures was refuted by Dr. Davis. (PPL RB at 12) Exhibit 4 is a document dated 1971. Dr. Davis, who has conducted research for the Navy, testified that the Navy's interest about RF fields in the 1970's was whether there were thermal (heating) effects caused by exposure to high-power radar transmissions. (PPL RB at 12) Dr. Israel testified that the bibliography "does not provide information about the design of the studies, the type and dose of exposures used, or the

outcomes of those exposures," and as such, "does not provide a reliable scientific basis for reaching a conclusion about the RF fields from the AMI meters being used by PPL Electric." (PPL RB at 12) More importantly, the Complainant states in his Exceptions that he submitted Exhibit 4 only for its "historical value" and that he "did not represent Exhibit 4 to be a reliable scientific bases [sic] for reaching conclusions about RF fields from PPL's AMI meters." (Exceptions at 7) Thus, the Commission should disregard Complainant's Exhibit 4.

Furthermore, Complainant's Exhibit 5 is not a scientific study published in a peer-reviewed scientific journal. (PPL RB at 12) Although presented as a list of "reviews" of non-thermal effects from RF fields, the exhibit's title is misleading "because most of the documents listed are not 'reviews' of the scientific literature, but individual studies or other documents," many of which were not published in peer-reviewed scientific journals (PPL RB at 12) Dr. Carpenter agreed that the list prepared by Dr. Pall, who was not present at the hearing to answer questions about what the document actually represents, is nothing more than a "bibliography," just like the Exhibit 4 bibliography from 1971, only "a little more primitive." (Tr. 121) "Most importantly," Dr. Israel observed, "this list of documents does not include any information about the design of the individual studies, the data produced in the studies, the analyses of the data, any qualitative evaluation of the individual studies and the data in the studies, or any showing that any critical or balanced criteria were used to identify and evaluate the scientific research." (PPL RB at 13) Therefore, the ALJ properly concluded that Complainant's Exhibits 3 through 5, and the studies cited therein, are not a reliable scientific basis upon which to render any decisions.

Third, there is no question that the ALJ and the Commission possess the expertise to assess and evaluate the scientific research on these issues. The Commission and its administrative law judges have long been dealing with issues related to electromagnetic fields

and the installation of AMI meters.[2] Moreover, courts have recognized the expertise of the Commission and its staff when there are issues involving public utilities' services and facilities.[3] Therefore, the issues in this matter are well within the Commission's expertise.

Fourth, the Complainant errs in claiming that studies with positive findings carry more weight than studies with negative findings. This distinction drawn by the Complainant fails to recognize what is most important—the fundamental requirement in science to show consistent replication of reported effects before they can be accepted as real. (PPL St. No. 1, p. 11) As Dr. Israel testified, "In any large body of laboratory research, such as the hundreds of studies conducted on RF fields, there are likely to be some contradictory findings, with some studies reporting biological effects that cannot be replicated or confirmed in other studies by independent researchers." (PPL St. No. 2, p. 8) Therefore, "when studies are recorded, they need to be replicated carefully to verify that the initial study that was done makes sense. And that's been a weakness. There's a very large body of literature in this area," and "not a single paper has ever [been] replicated." (Tr. 247) Thus, the Complainant's studies have little to no evidentiary value because none of them have been replicated.

For these reasons, the Complainant's Exceptions Nos. 1, 2, 15, and 16 should be denied.

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[2] *See, e.g., Letter of Notification of Phila. Elec. Co. Relative to the Reconstructing and Rebuilding of the Existing 138 kV Line to Operate as the Woodbourne-Heaton 230 kV Line*, 1992 Pa. PUC LEXIS 160 (June 29, 1992) (Initial Decision) ("*Woodbourne-Heaton*"); *Application of PPL Elec. Utils. Corp. Filed Pursuant to 52 Pa. Code Chapter 57, Subchapter G, for Approval of the Siting and Constr. Of the Pa. Portion of the Proposed Susquehanna-Roseland 500 kV Transmission Line*, Docket Nos. A-2009-2082652, *et al.*, 2010 Pa. PUC LEXIS 434 (Order entered Feb. 12, 2010); *Starr v. PECO Energy Co.*, Docket No. C-2015-2516061, p. 11 (Order entered Sept. 1, 2016).

[3] *See Vertis Grp. v. Pa. PUC*, 840 A.2d 390, 397 (Pa. Cmwlth. 2003); *Alderwoods (Pa.), Inc. v. Pa. PUC*, 2017 Pa. Commw. Unpub. LEXIS 326, at *6 (Pa. Cmwlth. 2017); *Optimum Image, Inc. v. Phila. Elec. Co.*, 600 A.2d 553, 557 (Pa. Super. 1991); *see also UGI Utils., Inc. v. City of Reading*, 179 A.3d 624 (Pa. Cmwlth. 2017).

B. REPLIES TO EXCEPTIONS NOS. 3, 4, 5, AND 11 – THE ALJ PROPERLY CONSIDERED AND FOUND THAT THE RF FIELDS FROM THE AMI METERS ARE SUBSTANTIALLY LESS THAN THE FEDERAL COMMUNICATIONS COMMISSION'S (FCC) EXPOSURE STANDARD AND THE RF FIELDS PRODUCED BY UHF TELEVISION TOWERS AND CELL PHONES

The Complainant claims that the ALJ erred in considering and finding that the RF fields from the AMI meters are substantially less than the Federal Communications Commission's ("FCC") RF safety exposure limits and the RF fields produced by UHF television broadcast towers and cell phones, because, according to him, these facts are irrelevant. (Exceptions at 7-10, 15) The Complainant argues that studies referenced in the BioInitiative Report (Complainant's Exhibit 3) show that adverse health effects occur below the levels of RF fields from UHF towers and cell phones. (Exceptions at 7-10, 15) Further, he alleges that his cell phone usage and the RF fields produced by cell phones are irrelevant because he "never place[s] a cell phone to [his] head" and "take[s] other precautions to minimize [his] exposure to RF radiation." (Exceptions at 10-11) The Complainant's arguments completely lack merit.

First, as explained above, Complainant's Exhibit 3 is a flawed, advocacy document that has been widely criticized for its lack of objectivity and scientific value, including by the Health Council of the Netherlands, the Texas Public Utility Commission, and many other government agencies. *See* Section II.A., *supra.* Therefore, Complainant's Exhibit 3 and the studies cited therein should not form the basis of any findings of fact in this case.

Second, contrary to the Complainant's allegations, it is especially relevant to compare the level of RF fields from the AMI meter to the FCC's exposure standard, the background RF exposures from UHF television towers, and the RF fields from cell phones. Concerning the FCC exposure standard, Dr. Davis testified that the FCC has determined safe public exposure levels for RF fields from devices that transmit RF signals, such as the AMI meters. (PPL MB at 17)

The FCC safe public exposure limits are based on evaluations of the body of scientific research on RF fields and were adopted in consultation with other federal agencies, including the Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA). (PPL MB at 17) The FCC also continues to consider whether new scientific research shows any adverse effects from RF fields. (PPL MB at 17) Thus, the fact that the FCC's standard is **98,000 times higher** than level of RF fields produced by the AMI meter is highly relevant to the consideration of the safety of those RF fields. (PPL MB at 17-18)

Likewise, comparing the AMI meter's RF field levels to the existing background levels of RF fields at Complainant's residence is relevant to the issues in this case. The crux of the Complainant's argument in this case is that the Company's AMI meter will cause or contribute to adverse health effects. However, at his residence, the Complainant has been continuously (24/7/365) exposed to background RF fields from UHF television broadcast towers that are **18.4 times higher** than the RF signals from the AMI meter. (PPL MB at 18) Yet, the Complainant continues to maintain that the AMI meter, not the existing and continuous RF exposures from the UHF television broadcast towers, will cause him to suffer adverse health effects.

Similarly, it is relevant to compare the AMI meter's RF field levels to those produced by cell phones. The record demonstrates that the Complainant regularly uses a cell phone, specifically 16,222 minutes (over 270 hours) over a 12-month period. (ID at 9) The Complainant tries to counter this fact by stating that he never places a cell phone to his head. As explained in the Company's Reply Brief, this fact is extra-record evidence and should be disregarded entirely. (PPL RB at 4) Nevertheless, the record demonstrates that a cell phone's RF fields even from 30 feet away are 3 times higher than from the AMI meter's RF fields. (PPL MB at 18) Even if the Complainant always kept his phone 1 meter (3+ feet) away from his body

– which is highly unlikely – his RF exposures from his cell phone would still be 8 times higher than those from the AMI meter. (PPL Exh. CD-6) Also, the Complainant's 16,222 minutes of cell phone usage equates to 3,198 years of continuous RF exposure at approximately 3 feet from the Company's AMI meter. (PPL MB at 18) Thus, the Complainant's cell phone usage and the level of RF fields to which he is exposed by cell phones are especially relevant to this case.

In sum, Dr. Davis's expert testimony on these points was not contradicted by any other expert testimony, and the ALJ properly found that the AMI meter's RF fields are much lower than the FCC's exposure standard and the RF fields from UHF towers and cell phones.

For these reasons, the Complainant's Exceptions Nos. 3, 4, 5, and 11 should be denied.

C. REPLY TO EXCEPTION NO. 6 – THE ALJ CORRECTLY FOUND THAT THE AMI METERS' RF SIGNALS ARE OF VERY SHORT DURATION AND OCCUR ONLY FOR A TOTAL OF 84 SECONDS PER DAY

The Complainant contests the ALJ's finding that the AMI meter's RF signals are of very short duration and only occur for a total of 84 seconds over a 24-hour period. (Exceptions at 11-12) Although he does not dispute that the signals total 84 seconds, the Complainant alleges that the "AMI smart meter can emit signals up to 8,400 times a day" and that "PPL has not answered the important question of how many times [its] AMI smart meter emits signals in a 24-hour period." (Exceptions at 11-12) He further requests that the Commission order an independent third-party test be conducted on an existing AMI meter to determine the number of transmissions per day. (Exceptions at 12) The Complainant's Exception completely lacks merit.

The record clearly demonstrates that the AMI meter's RF signals are of very short duration and occur only for a total of 84 seconds per day. Dr. Davis explicitly stated in his testimony, "The total daily time of RF signaling from the AMI meters used by PPL Electric is 84 seconds over the course of 24 hours, with individual signal durations of only 46 to 63 milliseconds." (PPL St. No. 1, p. 7) (emphasis added) This equates to about 1,720 transmissions

per day, as confirmed by PPL Electric witness Larson. (Tr. 219, 222-23) Dr. Davis' expert testimony on this point was not contradicted by any other expert witness's testimony. Therefore, the Complainant's claims are incorrect, and no need exists to independently test an AMI meter.

For these reasons, the Complainant's Exception No. 6 should be denied.

D. REPLY TO EXCEPTION NO. 7 – THE ALJ CORRECTLY STRUCK THE ADDITIONAL EVIDENCE PRESENTED FOR THE FIRST TIME IN THE COMPLAINANT'S MAIN AND REPLY BRIEFS

The Complainant seeks confirmation that certain portions of his Main Brief and Reply Brief were not stricken by the ALJ. (Exceptions at 12-13) As noted in the Company's Reply Brief and its Motion to Strike portions of the Complainant's Reply Brief, the Complainant tried to introduce and rely on many materials and facts that were presented for the first time at the briefing stage. (PPL RB at 4-9; PPL Motion to Strike ¶¶ 6-14) The ID correctly struck these portions of the Main and Reply Briefs because they were extra-record evidence. (ID at 16-17)

No need exists to confirm the portions struck by the ALJ, as requested by the Complainant. PPL Electric specifically identified the portions of the Complainant's Main and Reply Briefs that were extra-record evidence. (PPL RB at 4-6; PPL Motion to Strike ¶ 7) PPL Electric even submitted copies of the Complainant's Main and Reply Briefs with the extra-record evidence and any references to such materials deleted. (PPL RB, Appx. A; PPL Motion to Strike, Appx. A) Thus, these indicated portions of the Complainant's briefs are not in the record.

Based on the foregoing, the Complainant's Exception No. 7 should be denied.

E. REPLY TO EXCEPTION NO. 8 – THE ALJ PROPERLY DETERMINED THAT THE MAJORITY OF STUDIES PUBLISHED HAVE FAILED TO SHOW AN ASSOCIATION BETWEEN EXPOSURE TO RADIOFREQUENCY FROM A CELL PHONE AND HEALTH PROBLEMS

The Complainant challenges the ALJ's finding that the majority of studies published have failed to show an association between exposure to RF fields from a cell phone and adverse health

effects. (Exceptions at 13) As alleged support, the Complainant states that details on these studies, such as the authors and titles, are lacking. (Exceptions at 13) Further, he alleges that these studies constitute hearsay and should not be relied on by the Commission. (Exceptions at 13) Moreover, the Complainant contends that PPL Electric omitted "the WHO/IARC 2011 classification of RF radiation as a possible Group 2B carcinogen," which "was largely based on cell phone/brain tumor studies." (Exceptions at 13) The Complainant's Exception lacks merit.

First, the ALJ's finding is directly based on the conclusion of the FDA. (PPL St. No. 1, pp. 11-12) As noted in Dr. Davis's expert testimony, the FDA has concluded that "[t]he majority of studies published have failed to show an association between exposure to radiofrequency from a cell phone and health problems." (PPL St. No. 1, pp. 11-12) This conclusion is entirely consistent with the expert testimony of Dr. Israel, who researched studies on RF fields and health effects published in peer-reviewed scientific journals and who analyzed the exhibits presented by the Complainant on these issues. (PPL St. No. 2, pp. 8-24) Based on his evaluation, Dr. Israel found that there is no reliable medical basis to conclude that the RF fields from the AMI meter will cause or contribute to the development of illness or disease or would cause, contribute to, or exacerbate any adverse health effects. (PPL St. No. 2, p. 25) Furthermore, the WHO has analyzed the scientific research on these issues and found that although "[a] large number of studies have been performed over the last two decades to assess whether mobile phones pose a potential health risk[,] . . . no adverse health effects have been established as being caused by mobile phone use." (PPL St. No. 2, p. 19) Thus, the record fully supports the ALJ's finding

Second, the Complainant fails to recognize that he never objected to this evidence and that expert witnesses, such as Dr. Davis and Dr. Israel, are permitted to rely on hearsay in forming their expert opinions. Indeed, a well-established exception to the hearsay rule is that an

expert may express an opinion that is based on material not in evidence, including other expert opinions, where such material is of a type customarily relied on by experts in his or her profession.[4]

Third, PPL Electric explicitly addressed the IARC classification of RF fields from mobile phones in its testimony. Dr. Israel testified that "[i]n 2011, IARC convened a group of scientists to examine whether RF fields cause cancer." (PPL St. No. 1, p. 19) "The evaluation of this group found that RF fields from mobile phones were 'possibly carcinogenic' based on what it described as 'limited evidence,' but did not find that RF fields from mobile phones were either 'carcinogenic' or even 'probably carcinogenic' under the IARC classification system." (PPL St. No. 1, p. 19) Moreover, "IARC concluded that for environmental exposures to RF fields, including RF fields from smart meters, the research was 'inadequate' to reach conclusions about cancer causation." (PPL St. No. 1, p. 19) Thus, the record demonstrates that the Company did not omit addressing the IARC classification, as alleged by the Complainant.

For these reasons, the Complainant's Exception No. 8 is without merit and should be denied.

F. REPLY TO EXCEPTION NO. 9 – THE COMPLAINANT'S EXHIBITS SHOULD NOT BE USED TO SUPPORT ANY FINDINGS OF FACT

The Complainant criticizes the Company's position that none of his exhibits should be used to support any findings of fact. (Exceptions at 13-14) He alleges that the Company has failed to refute his "scientific evidence and studies" that he "researched and presented to the Commission." (Exceptions at 13) The Complainant also claims that his Exhibits 3 through 5

[4] *See Lower Makefield Twp. v. Lands of Dalgewicz*, 4 A.3d 1114, 1122 (Pa. Cmwlth. 2010), *affirmed*, 67 A.3d 772 (Pa. 2013); *Collins v. Cooper*, 746 A.2d 615, 618 (Pa. Super. 2000); *Primavera v. Celotex Corp.*, 608 A.2d 515, 520-21 (Pa. Super. 1992); Pa.R.E. 703.

were endorsed by Dr. Carpenter and that nine of his exhibits are government documents. (Exceptions at 14) The Complainant's Exception is without merit.

PPL Electric addressed the Complainant's exhibits in detail and demonstrated that they lack scientific and evidentiary merit. (PPL MB at 35-43) Indeed, many of the documents were uncorroborated hearsay, lacked authenticity, were irrelevant because they did not address RF fields from AMI meters, and were selectively excerpted. (PPL MB at 37-42) The fact that a document may have been issued by a governmental entity does not cure these defects. Moreover, as explained herein, the Complainant's reliance on Exhibits 3 through 5 is misplaced because they contain flaws and were endorsed by Dr. Carpenter, who offered flawed and unreliable testimony in this proceeding. *See* Section II.A., *supra*, and Section II.L., *infra*.

Based on the foregoing, the Complainant's Exception No. 9 should be denied.

G. REPLY TO EXCEPTION NO. 10 – THE ALJ PROPERLY FOUND THAT WHILE SOME RESEARCHERS HAVE REPORTED BIOLOGICAL CHANGES ASSOCIATED WITH RF ENERGY, THESE STUDIES HAVE FAILED TO BE REPLICATED

The Complainant contests the ALJ's finding that while some researchers have reported biological changes associated with RF energy, these studies have failed to be replicated. (Exceptions at 14-15) The Complainant avers that the 4,266 studies that he identified "replicate the fundamental point . . . that non-thermal RF radiation can create biological and adverse health effects." (Exceptions at 14) The Complainant's Exception is without merit.

The ALJ's finding is supported by the FDA's conclusion that "scientists have conducted hundreds of studies looking at the biological effects of the radiofrequency energy emitted by cell phones" and that "[w]hile some researchers have reported biological changes associated with RF energy," the studies have not been replicated. (PPL St. No. 1, p. 11)

In addition, the Complainant continues to confuse the replication of findings with the replication of studies. To the Complainant and Dr. Carpenter, it is sufficient that multiple studies make similar observations. (Exceptions at 14; Tr. 79) However, what actually matters is whether the study itself can be replicated.

For these reasons, the Complainant's Exception No. 10 should be denied.

H. REPLY TO EXCEPTION NO. 12 – THE ALJ CORRECTLY CONCLUDED THAT THE WORLD HEALTH ORGANIZATION AND OTHER PUBLIC HEALTH AUTHORITIES HAVE CONCLUDED THAT THE SCIENTIFIC RESEARCH ON RF EXPOSURES FROM CELL PHONE USE HAS NOT SHOWN THAT RF FIELDS CAUSE ADVERSE HEALTH EFFECTS

The Complainant disputes the ALJ's determination that the WHO and other public health authorities have found that the scientific research on RF exposures from cell phone use has not shown that RF fields cause adverse health effects. (Exceptions at 15-16) In support, the Complainant alleges that the ALJ failed to mention that the IARC, an agency of the WHO, classified non-thermal RF radiation as a Class 2B carcinogen and that other countries and government authorities disagree with the WHO. (Exceptions at 15) The Complainant also contends that the WHO advocates for the Precautionary Principle. (Exceptions at 16) The Complainant's Exception lacks merit.

First, there was no need for the ALJ to mention the IARC's classification of RF fields from cell phones. As explained in Section II.E., *supra*, the IARC "found that RF fields from mobile phones were 'possibly carcinogenic' based on what it described as 'limited evidence,' but did not find that RF fields from mobile phones were either 'carcinogenic' or even 'probably carcinogenic' under the IARC classification system." (PPL St. No. 1, p. 19) More importantly, "IARC concluded that for environmental exposures to RF fields, **including RF fields from smart meters**, the research was 'inadequate' to reach conclusions about cancer causation."

(PPL St. No. 1, p. 19) (emphasis added) Later, while acknowledging the IARC's finding, the WHO issued a statement emphasizing that the scientific research has not established the existence of any adverse effects caused by RF fields used for wireless communications. (PPL St. No. 1, p. 19) In other words, when evaluating the finding of its agency, the WHO found that the research did not establish that RF fields from mobile phones cause adverse health effects.

Second, any contrary findings by other governmental entities are greatly outweighed by the authoritative conclusions of the WHO, other public health authorities, and public utility commissions. Indeed, based on the body of scientific research showing no consistent and reproducible effects from RF fields on cancer and other adverse health effects, the WHO concluded that "no adverse health effects have been established as being caused by mobile phone use." (PPL MB at 24; PPL Exhs. MI-1 & MI-2) Many other public health authorities, including agencies in Canada, the U.K., Sweden, Norway, the Netherlands, and New Zealand, among others, have recently reached similar conclusions. (PPL MB at 24) Furthermore, several U.S. state public health authorities and Public Utility Commissions have investigated claims about health effects from smart meters. (PPL MB at 24) These include the Maine Center for Disease Control (2010), the Vermont Department of Health (2012), Arizona Department of Health, Office of Environmental Health (2014), and North Carolina Department of Health and Human Services, Division of Public Health, Occupational and Environmental Epidemiology Branch (2015). (PPL MB at 24) These evaluations by health authorities and public utility commissions conclude that RF fields from smart meters do not pose any public health risk. (PPL MB at 24)

Third, the "precautionary principle" is an extreme standard that should not be adopted in this proceeding. Importantly, the precautionary principle has <u>never</u> been utilized in any Commission proceeding. Therefore, its adoption here would be unprecedented. Moreover, the

precautionary principle would unreasonably and unlawfully shift the burden of proof. The burden is not on the Company to prove a negative. Rather, under Section 332(a) of the Public Utility Code, the burden is on the Complainant to prove that the new AMI meter will cause adverse health effects.[5] Further, as the D.C. Circuit Court of Appeals observed:

> [The precautionary principle] approach to regulation has been criticized. The precautionary principle "imposes a burden of proof on those who create potential risks, and it requires regulation of activities even if it cannot be shown that those activities are likely to produce significant harms. Taken in this strong form, the precautionary principle should be rejected, not because it leads in bad directions, but because it leads in no direction at all. The principle is literally paralyzing — forbidding inaction, stringent regulation, and everything in between. The reason is that in the relevant cases, every step, including inaction, creates a risk to health, the environment, or both." Cass R. Sunstein, Beyond the Precautionary Principle, 151 U. Pa. L. Rev. 1003, 1003 (2003).

Competitive Enter. Inst. v. United States, 863 F.3d 911, 918-19 (D.C. Cir. 2017) (finding that the U.S. Department of Transportation's e-cigarette regulation was not arbitrary because the regulation's benefits justified the costs and the regulation was not simply based on a "precautionary approach"). Thus, the precautionary principle proposed by the Complainant should not be adopted in this case.

Based on the foregoing, the Complainant's Exception No. 12 should be denied.

I. REPLY TO EXCEPTION NO. 13 – THE ALJ PROPERLY RELIED ON THE EXPERT TESTIMONY OF DR. CHRISTOPHER DAVIS THAT THERE ARE MANY STUDIES THAT RECORD NO EFFECTS FROM RF EXPOSURE

[5] *See* 66 Pa. C.S. § 332(a); *Woodbourne-Heaton*, 1992 Pa. PUC Lexis 160, at *211 (stating that a person must demonstrate by a preponderance of the evidence that electromagnetic field exposure actually causes adverse health effects); *Kreider v. PECO Energy Co.*, Docket No. P-2015-2495064, p. 18 (Order entered Sept. 3, 2015) ("The Complainant will have the burden of proof during the proceeding to demonstrate, by a preponderance of the evidence, that [the utility] is responsible or accountable for the problem described in the Complaint."); *see also Romeo v. Pa. PUC*, 154 A.3d 422, 429 (Pa. Cmwlth. 2017) (finding that the smart meter complainant should have a hearing to try to prove his claim through "the testimony of others as well as other evidence that goes to that issue").

The Complainant challenges the ALJ's determination that she was persuaded by the credible testimony of Dr. Davis, who explained that "there are also hundreds of studies, probably thousands of studies that record no effects" from RF exposure. (Exceptions at 16; *see* ID at 20) In the absence of the studies' authors, years, and titles, the Complainant avers that his evidence should be given more weight. (Exceptions 16) Moreover, the Complainant reiterates his belief that a study with positive findings is more significant than a study with negative findings. (Exceptions at 16) The Complainant's arguments are without merit.

It was entirely reasonable for the ALJ to rely on Dr. Davis's expert testimony. (PPL MB at 15-20) Dr. Davis is a highly experienced scientific researcher and teacher in Physics, Electrical Engineering, Electromagnetics, and Radio Frequency Electromagnetics. (PPL MB at 16) Dr. Davis has a Ph.D. in Physics and is a full Professor with an endowed Chair at the University of Maryland, where for over 30 years he has taught Physics, Electrical Engineering, Electromagnetics, and RF Electromagnetics to undergraduate and graduate students. (PPL MB at 16) In addition to his teaching, Dr. Davis is an active scientific researcher in the fields of Physics, Biophysics, Electrical Engineering, Bioelectromagnetics and RF Bioelectromagnetics. (PPL MB at 16) He has conducted many scientific studies in these fields and has published over 250 studies in peer-reviewed scientific journals. (PPL MB at 16) Thus, Dr. Davis was certified as an expert in physics, biophysics, chemistry, electrical engineering, electromagnetics, bioelectromagnetics, radiofrequency bioelectromagnetics, and dosimetry. (Tr. 228-29)

Here, studies concerning the biological effects, if any, caused by non-thermal RF radiation fall squarely within Dr. Davis's expertise. Indeed, he has conducted a substantial amount of research on RF fields of the type produced by the AMI meters being used by the Company. (PPL MB at 16) Dr. Davis also has served on expert committees that have evaluated

the scientific research on RF fields, including the Institute of Electrical and Electronic Engineers ("IEEE") Committee on Man and Radiation ("COMAR") and as chair of the Subcommittee on Radio Frequency Fields, which consists of experts who examine the scientific research on RF fields and evaluate the IEEE exposure guidelines. (PPL MB at 16) Moreover, throughout his expert testimony, Dr. Davis recounted the scientific research conducted on the topic and the findings reached by several entities, including the WHO and the FDA, based on that research. (PPL St. No. 1, pp. 8-13) Thus, Dr. Davis was more than qualified to testify generally that hundreds, if not thousands, of studies show that there are no effects from exposure to RF fields. Moreover, the Complainant chose not to examine Dr. Davis on this opinion at the hearing.

In addition, as explained in Section II.A., *supra*, the Complainant's contention that positive findings in studies carry more weight than studies with no findings is without merit.

Based on the foregoing, the Commission should deny Complainant's Exception No. 13.

J. REPLY TO EXCEPTION NO. 14 – THE ALJ PROPERLY REJECTED THE COMPLAINANT'S ATTEMPT TO INTRODUCE EVIDENCE RELATED TO THE DRAFT, UNPUBLISHED NATIONAL TOXICOLOGY PROGRAM STUDY

The Complainant disputes the ALJ's exclusion of his evidence related to the draft, unpublished National Toxicology Program ("NTP") study. (Exceptions at 16-17) As alleged support, the Complainant contends that the ALJ should have reopened the record to admit this evidence because: (1) the information was new or novel; and (2) the introduction of this evidence would be in the public interest. (Exceptions at 17) Further, the Complainant alleges that he should have been permitted to elicit testimony from his witness, Dr. Carpenter, about the draft NTP study. (Exceptions at 17) The Complainant also requests that the Commission withhold ruling on the instant matter and any other AMI complaint cases until the NTP's final study is released. (Exceptions at 17) The Complainant's Exception is without merit.

The ALJ properly denied the Complainant's request to reopen the record because he failed to prove that this document was "new or novel evidence" or demonstrate that there was "any change in fact or law that would warrant the reopening of the record in the public interest." (ID at 17) In fact, the Complainant admitted in his Motion to Reopen the Record that this document was publicly available days before the evidentiary hearing on April 2, 2018, and well before the record closed on April 23, 2018. (Motion to Reopen at 2) Therefore, this evidence was not "new or novel," and there was no "change in fact or law" after the record closed. (ID at 17) Moreover, by waiting nearly three months to try to introduce this proposed exhibit at the briefing stage, the Complainant severely prejudiced PPL Electric. (PPL Answer to Motion to Reopen ¶ 18) At that point in the proceeding, the Company had no opportunity to cross-examine him about the document or present expert scientific evidence in rebuttal. (PPL Answer to Motion to Reopen ¶ 18)

Further, the document merely recounts the peer review panels' recommendations to the NTP with regard to its reports, which have not yet been finalized. (PPL Answer to Motion to Reopen ¶ 20) These recommendations, which are not binding on NTP, have little to no evidentiary value. (PPL Answer to Motion to Reopen ¶ 20) Like the NTP's draft studies, which have **not** been submitted for publication in peer-reviewed journals, this proposed exhibit should not be admitted into the record in this proceeding. (PPL Answer to Motion to Reopen ¶ 20) Notwithstanding, if the proposed exhibit is admitted, the Commission should not rely upon these recommendations because they are hearsay. (PPL Answer to Motion to Reopen ¶ 21)

In addition, contrary to the Complainant's claim, the draft NTP study was not within the scope of Dr. Carpenter's testimony. Prior to the evidentiary hearing, Dr. Carpenter submitted direct testimony, in which he identified all of the exhibits upon which he would rely.

(Complainant's Exhibit 1) None of these exhibits were the draft NTP study. Therefore, the ALJ correctly prohibited Dr. Carpenter from testifying about the draft NTP study.

For these reasons, the Complainant's Exception No. 14 should be denied.

K. REPLY TO EXCEPTION NO. 17 – THE ALJ PROPERLY FOUND THAT IT IS INACCURATE TO CLAIM THAT THE AMI METERS CREATE "PULSED" FIELDS

The Complainant challenges the ALJ's finding that it is inaccurate to claim that the AMI meters create "pulsed" fields. (Exceptions at 18-19) According to the Complainant, it is "semantics" for others to criticize his use of the term "pulsed." (Exceptions at 18) His objection is that the AMI meter will emit "thousands of intermittent, very brief bursts of intense energy 24/7/365" and that the AMI will cause adverse health effects. (Exceptions at 18-19) The Complainant's Exception lacks merit.

The Complainant's use of the term "pulsed" is not semantics; it is an inaccurate claim that he has repeated throughout this proceeding. For example, in his Main Brief, the Complainant continued to maintain that the AMI meters create "pulsed" fields and insisted that his health concerns stem from "intermittent spikes of peak energy." (Complainant's MB at 7, 13, 15, 26, 27, 29, 33) As explained by Dr. Davis, "This is a frequently misstated fact." (Tr. 234) Dr. Davis was the only expert witness who provided testimony about the nature of RF fields from the AMI meters being used by PPL Electric. The AMI meter being used by PPL Electric does not produce pulsed fields. Rather, it "produces sinusoidal RF fields, which are physically different fields from pulsed fields." (PPL St. No. 1, p. 8) Therefore, it is inaccurate to claim that the AMI meters create "pulsed" fields.

Regarding the RF fields produced by the AMI meter being used by the Company, the AMI meters will not emit thousands of RF signals constantly, as alleged by the Complainant. As explained in Section II.C., *supra*, the total daily time of RF signaling from the AMI meters used

by PPL Electric is 84 seconds over the course of 24 hours, with individual signal durations of only 46 to 63 milliseconds." (PPL St. No. 1, p. 7) Further, there is no reliable scientific or medical basis to conclude that the new AMI meter will cause or contribute to adverse health effects. *See* Section II.A., *supra*, and Section II.L., *infra*. In fact, the Complainant does not contest Dr. Davis's expert testimony that the average exposure is 98,000 lower than the FCC RF exposure standard and that the peak RF exposures from the AMI meter is 95 times lower than the exposure standard. (PPL St. No. 1, p. 13; *see also* PPL Exh. CD-3)

Based on the foregoing, the Complainant's Exception No. 17 should be denied.

L. REPLIES TO EXCEPTIONS NOS. 18 AND 19 – THE ALJ CORRECTLY DETERMINED THAT THE EXPERT TESTIMONY OF DR. DAVIS AND DR. ISRAEL WAS MORE CREDIBLE AND RELIABLE THAN THE FLAWED TESTIMONY OF DR. CARPENTER

The Complainant disputes the ALJ's determination that the expert testimony of Dr. Davis and Dr. Israel was more credible and reliable than the flawed testimony of Dr. Carpenter. (Exceptions at 19-22) The Complainant alleges that Dr. Davis "based his testimony on arithmetic, conjecture and hypothesis" that have "no scientific merit." (Exceptions at 19-22) As for Dr. Israel, the Complainant contends that Dr. Israel only "cited 10 negative studies" to support his expert opinion that "there is no reliable medical basis to conclude that non-thermal RF radiation from PPL's AMI meter will cause or contribute to illness or disease." (Exceptions at 20-22) The Complainant also contests the ALJ's decision to only afford "some weight" to certain exhibits sponsored by Dr. Carpenter. (Exceptions at 21-22) According to the Complainant, Dr. Carpenter's opinion is more credible than the opinions of the Company's experts. (Exceptions at 21-22) The Complainant's arguments wholly lack merit.

The ALJ correctly relied on the expert opinions of Dr. Davis and Dr. Israel because they have exceptional qualifications and presented thorough, credible, and reliable opinions in this

matter. As explained in Section II.I., *supra*, Dr. Davis is a highly experienced scientific researcher and teacher in Physics, Electrical Engineering, Electromagnetics, and Radio Frequency Electromagnetics. Dr. Davis explained that there is nothing unusual about the RF fields from the AMI meters being deployed by the Company. (PPL MB at 17) Further, as detailed in Section II.B., *supra*, the FCC has determined the safe public exposure levels for RF fields from devices that transmit RF signals, such as the AMI meters, and continues to consider whether new scientific research shows any adverse effects from RF fields. (PPL MB at 17) Based on the engineering specifications for the Landis & Gyr AMI meter being deployed by the Company, Dr. Davis calculated that the levels of RF fields from the AMI meters are **98,000 times lower** than the RF exposure safety limits established by the FCC. (PPL MB at 17-18) As a result, Dr. Davis found that "the RF field levels from the AMI meters being used by PPL Electric more than comply with the applicable FCC RF exposure limit." (PPL MB at 18)

Additionally, Dr. Davis calculated the RF field levels from everyday sources to which the Complainant is exposed, including the background RF exposure from UHF television broadcast towers and the RF exposure from cell phones. (PPL MB at 18-19) Here, the constant background RF fields at Complainant's residence are **18.4 times higher** than the RF signals from the AMI meter, and the RF fields are 3 times higher than from the AMI meter when standing 30 feet away from a person using a cell phone. (PPL MB at 18) The Complainant never disputed these calculations and cannot dismiss them by claiming that they are only arithmetic. These calculations were made by a highly qualified expert, are reliable, and are unrebutted.

Dr. Israel is an eminent physician and medical researcher and was exceptionally qualified to testify on the medical issues in this case. (PPL MB at 20-26) Dr. Israel is board certified and licensed to practice medicine; over the course of his distinguished career, he trained and directed

research at the National Institutes of Health, led research laboratories at prominent universities, and directed a major public health care facility. (PPL MB at 20-21) He is a professor at Dartmouth Medical School and the Executive Director of the Israel Cancer Research Fund in New York. (PPL MB at 20) He has conducted medical research for 40 years in a wide variety of areas and has published over 245 medical research studies in leading peer-reviewed scientific journals. (PPL MB at 21) Based on his extensive medical education, training and experience, Dr. Israel was certified as an expert in medicine and medical research, in particular as related to radiofrequency ("RF") fields and health. (Tr. 260-61) Notably, the Complainant did not object to Dr. Israel being certified as an expert. (Tr. 260-61)

In this proceeding, Dr. Israel evaluated the body of scientific research on RF fields and adverse health effects, not only "10 negative studies" as alleged by the Complainant. (PPL MB at 22) Indeed, Dr. Israel has been systematically examining this research over the past several decades and that many hundreds of studies have been published. (PPL MB at 22) He testified that three groups of controlled laboratory studies on animals "are particularly informative because they address fundamental biological functions that are very sensitive to any disruption: genetics, reproduction, and growth and development." (PPL MB at 22) Dr. Israel described a number of the studies in these areas which he considered good examples of well-designed and well-conducted studies. (PPL MB at 22) These studies found no adverse effects on genetics, fertility, reproduction, growth or development in the animals exposed to RF fields. (PPL MB at 22) Dr. Israel also provided examples of well-conducted animal studies on RF fields and cancer. (PPL MB at 22) He testified that these studies, which involved animals with lifetime exposures to RF fields, did not find any increased incidence in cancer in the RF exposed animals compared to non-exposed animals. (PPL MB at 22) Dr. Israel also evaluated the exhibits that the

Complainant presented, including the BioInitiative Report (Complainant's Exhibit 3). (PPL MB at 24-25) He testified that these exhibits are not scientific studies and demonstrated that they cannot be used to reach a reliable conclusion about RF fields and health. (PPL MB at 25)

By contrast, the Complainant presented the flawed and unreliable opinions of Dr. Carpenter. Dr. Carpenter has never been licensed to practice medicine, is not board certified in any area of medicine, and does not diagnose or treat patients for any kind of condition or illness. (PPL MB at 26) Dr. Carpenter also selectively provided information that he viewed as supporting his views and withheld information that contradicted his positions. (PPL MB at 27-28) For example, in the Volkow study referenced by Dr. Carpenter, the authors emphasize that the finding in their study "is of unknown clinical significance." (PPL MB at 27) Despite being "very familiar" with the study, Dr. Carpenter chose to conceal that information from the Court until he was confronted with it on cross-examination. (PPL MB at 28) Similarly, concerning Dr. Carpenter's paper that he presented to the President's Cancel Panel (Complainant's Exhibit 27), the Panel issued a report in 2009 that strongly refuted Dr. Carpenter's opinions. (PPL MB at 28) Again, Dr. Carpenter admitted that he knew the President's Cancer Panel had rejected his interpretation of the science, but he decided not to present those findings to the Court. (PPL MB at 28-29) Finally, Dr. Carpenter was an editor of the BioInitiative Report (Complainant's Exhibit 3), which as explained Section II.A., *supra*, is an unbalanced and unreliable advocacy document that has been strongly criticized by public health organizations and expert groups.

In sum, Dr. Carpenter's approach is that of an advocate, not a balanced scientific researcher. This finding is supported by the many cases, including before this Commission,[6]

[6] *See Application of PPL Elec. Utils. Corp. Filed Pursuant to 52 Pa. Code Chapter 57, Subchapter G, for Approval of the Siting and Constr. Of the Pa. Portion of the Proposed Susquehanna-Roseland 500 kV Transmission Line in Portions of Lackawanna, Luzerne, Monroe, Pike and Wayne Cntys., Pa.*, Docket Nos. A-2009-2082652, *et al.*, 2010 Pa. PUC LEXIS 434, at *172-73 (Order entered Feb. 12, 2010).

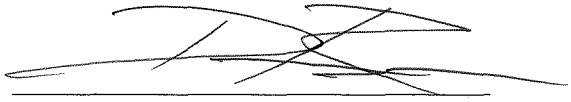
where Dr. Carpenter's opinion has been rejected as flawed and unreliable. (PPL MB at 31-35) Thus, the ALJ properly accorded more weight to the expert opinions of Dr. Davis and Dr. Israel.

For these reasons, the Complainant's Exceptions Nos. 18 and 19 should be denied.

III. CONCLUSION

WHEREFORE, for all the foregoing reasons, as well as those more fully explained in the Initial Decision of Administrative Law Judge Elizabeth H. Barnes and the limited Exception filed by PPL Electric Utilities Corporation, the Company respectfully requests that the Pennsylvania Public Utility Commission: (1) deny the Exceptions filed by Richard N. Myers; and (2) adopt the Initial Decision consistent with the Company's limited Exception.

Respectfully submitted,



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