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August 3, 2018

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor
Harrisburg, PA 17120

Re: James Quigley & Teresa Mendez Quigley v. PECO Energy Company
Docket No. C-2017-2617558

Dear Secretary Chiavetta:

PECO's *Main Brief* is attached for filing.

Very truly yours,



Ward L. Smith
Counsel for PECO Energy Company

WS/adz
Enclosures

c: Honorable Darlene D. Heep, ALJ
Certificate of Service

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

James Quigley & Teresa Mendez Quigley :
 : Docket No. C-2017-2617558
 v. :
 :
 PECO Energy Company :

CERTIFICATE OF SERVICE

I, Ward L. Smith hereby certify that on August 3, 2018, I served a copy of PECO Energy Company's *Main Brief*, in the above matter, upon all interested parties via overnight delivery to:

James Quigley &
Teresa Mendez Quigley
401 Longfield Road
Erdenheim, PA 19038

Dated: August 3, 2018



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**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

James Quigley and	:	
Teresa Mendez-Quigley	:	
	:	
v	:	C-2017-2617558
	:	
PECO Energy Company	:	

Main Brief of PECO Energy Company

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Introduction

This proceeding involves a claim by the Quigley's that installation by PECO Energy Company ("PECO") of an Advanced Metering Infrastructure ("AMI") electric meter at the Quigley residence will cause harm to Mrs. Mendez-Quigley's health.

After a full, two-day, evidentiary hearing, the Quigley's did not prove their claims by a preponderance of the evidence. To the contrary, PECO provided substantial, persuasive evidence that its AMI meters will not cause, contribute to, or exacerbate harm to Mrs. Mendez-Quigley's health. Therefore, the Quigley's Complaint should be dismissed.

Background and Procedural History

At the evidentiary hearing, Your Honor instructed the parties that their Briefs do not need to include background and procedural history. Apr 18 Tr. 297-98.

Proposed Findings of Fact
Testimony of James Quigley

1. Complainants reside at 401 Longfield Road, Erdenheim, PA, 19038. Apr 17 Tr. 7.
2. Complainants filed their complaint in August 2017. Apr 17 Tr. 15.
3. Mr. Quigley is concerned about installation of a PECO AMI meter because he believes that radiofrequency transmissions affect the immune system, and his wife has an autoimmune disease. Apr 17 Tr. 16.
4. Mr. Quigley is concerned about installation of a PECO AMI meter because he believes that radiofrequency transmissions affect Vitamin D absorption, and his wife has been diagnosed with extremely low Vitamin D absorption and osteoporosis. Apr 17 Tr. 16.
5. Mr. Quigley is concerned about installation of a PECO AMI meter because he believes that radiofrequency transmissions affect coronary artery disease, and his wife has a family history of coronary heart disease. Apr 17 Tr. 16-17.
6. The auto-immune disease that Mrs. Mendez-Quigley has is known as “Sjogren’s syndrome,” which is a systematic autoimmune disease that affects the entire body and is characterized by symptoms of excessive dryness of the mouth, eyes, etc., profound fatigue, chronic pain, major organ involvement, neuropathies, and lymphomas. Apr 17 Tr. 34-41.
7. Mr. Quigley reviewed published research on radiofrequency fields and the immune system, and from that research he formed a concern that exposure to radiofrequency fields impact the immune functionality of someone, like his wife, who has an autoimmune disease. Apr 17 Tr. 73-86.
8. In 2006, Mr. Quigley did measurements at his home in which he had his wife lay in their bed holding an antenna that was connected to a multi-meter. He then turned off the various

circuits to the house in sequence and noted the change in the multi-meter readings (although those readings are in storage and were not presented at the hearing.) He subsequently began to turn of the circuit to their bedroom before going to bed, and pain in his leg and back began to subside. Apr 17 Tr. 86, 91-96.

9. The Quigley's currently have a PECO AMR electric meter. Apr 17 Tr. 96.
10. Mr. Quigley reviewed published research on radiofrequency fields and Vitamin D synthesis, and from that research he formed a concern that exposure to radiofrequency fields impact and down-regulate the synthesis of Vitamin D. Apr 17 Tr. 98-102.
11. Mr. Quigley reviewed published research on radiofrequency fields and cardiovascular endpoints, and from that research he formed a concern that exposure to radiofrequency fields can create arrhythmias and other cardiovascular challenges. Apr 17 Tr. 102-104.
12. Mr. Quigley believes that PECO misrepresented information regarding its AMI meters. In particular, he is concerned that PECO gave misinformation regarding the transmission periodicity of its meters. He has this concern because PECO represented that its AMI meters transmit once every 90 minutes, or less, and he found an article from the California Council for Science and Technology ("CCST") that states that AMI meters in mesh systems can have a 50% duty cycle, which he understands to mean that they transmit 50% of the time. Apr 17 Tr. 104-111.
13. Mr. Quigley also has a concern that the CCST made statements about health and safety of AMI meters, and he does not believe that the CCST is qualified to make statements about health and safety. Apr 17 Tr. 112-118.
14. Mr. Quigley believes that the radiofrequency transmissions from PECO's AMI meters exceed the maximum exposures allowed by the Federal Communications Commission

("FCC"). He reached this conclusion based on a report issued by Sage and Associates. Apr 17 Tr. 118-119, 130

15. Mr. Quigley believes that the FCC limits are not low enough to protect human health. Apr 17 Tr. 119.

16. Mr. Quigley believes the FCC's limits are not adequate because an enormous amount of scientific research has been conducted since the FCC limits were enacted. Apr 17 Tr. 121.

17. Mr. Quigley reviewed published research on radiofrequency fields and the myelin sheath, and from that research he formed a concern that exposure to radiofrequency fields can cause neuropathy. Apr 17 Tr. 102-130-131.

18. The Complainants would like the Commission to provide an opt out. Apr 17 Tr. 132.

Testimony of Teresa Mendez-Quigley

19. Mrs. Mendez-Quigley has been tested positive for antinuclear antibodies ("ANA"), but that is not the reason that she is concerned about a PECO AMI meter. She is concerned about installation of a PECO AMI meter because she has Sjogren's syndrome and therefore she needs to protect her health. Apr. 17 Tr. 43-45.

20. Mrs. Mendez-Quigley does not know what kind of meter is currently on her residence. Apr. 17 Tr. 45.

21. In 2014, PECO contacted the Complainants to install an AMI meter, but an AMI meter was not installed. Apr 17 Tr. 45-46.

22. Mrs. Mendez-Quigley is sensitive to many exposures, such as chemicals, medicines, shampoos, conditioners, and cleaners. Apr 17 Tr. 47-49.

23. Mrs. Mendez-Quigley has taken steps to reduce her exposure to radiofrequency fields, including getting rid of her microwave oven and cordless phone. She uses a cell phone for

personal use and a separate cell phone for business use, but tries to keep them at a distance from her and minimize her use of them. She has eliminated Wifi at her home. Apr 17 Tr. 51-54, 63-66.

24. Mrs. Mendez-Quigley is concerned that additional radiofrequency exposure from a PECO AMI meter will interfere with her ability to synthesize Vitamin D and will thus increase her risk of osteoporosis. Apr 17 Tr. 55.

25. Mrs. Mendez-Quigley is concerned that additional radiofrequency exposure from a PECO AMI meter will worsen her Sjogren's symptoms. Apr 17 Tr. 56-58.

26. In the Quigley household, it is possible to pick up approximately 20 Wifi signals that originate outside of the residence. Apr 17 Tr. 58-59, 61-62.

27. The Quigley residence is a one-story, split-ranch, single-family home of approximately 2,000 square feet, on a quarter-acre lot. The neighbor's homes are about 20 feet away on either side. Apr 17 Tr. 59-61.

28. The electric meter is located at the back of the house near a room that Mrs. Mendez-Quigley uses as an in-home office and sometimes as a bedroom. Apr 17 Tr. 60.

29. Mrs. Mendez-Quigley is not interested in relocating the meter board to a greater distance because the signals about which she is concerned can travel a distance and the Quigley's do not have the resources to pay for a meter board relocation. Apr 17 Tr. 62.

30. Mrs. Mendez-Quigley's place of work has Wifi, and she spends about 16-20 hours per week at that location. Apr 17 Tr. 69-70

Testimony of Bryan Uber

31. Bryan Uber is a Senior Supervisor, Customer Field Operations, for PECO. Apr 17 Tr. 175.

32. The Quigley's electric AMR meter was installed on October 25, 2001. Apr 17 Tr. 183.

33. PECO has not installed an electric AMI meter at the Quigley residence. Apr 17 Tr. 182.
34. PECO has completed its AMI deployment. The only residential customers who still have AMR meters are those with formal complaints pending. Apr 17 Tr. 177, 213.
35. In June 2012, the Quigley's informed PECO that they did not want an electric AMI meter installed at their residence. Apr 17 Tr. 178; PECO Exh. BU-1, p. 1.
36. In December 2013, PECO informed the Quigley's that electric AMI meter deployment was scheduled to begin in their area soon. Apr 17 Tr. 179; PECO Exh. BU-1, p. 1.
37. On January 4, 2014, PECO's vendor Grid One attempted to install an electric AMI meter at the Quigley residence, but were not successful. Apr 17 Tr. 189, 199; PECO Exh. BU-1, p. 1.
38. On April 3, 2014, Mr. Quigley called PECO and restated that the Quigley's did not want an electric AMI meter. Apr 17 Tr. 180-81; PECO Exh. BU-1, p. 1.
39. On April 16, 2014, PECO received a letter from the Quigley's stating that they did not want an electric AMI meter installed. The letter contained a note from their doctor that in its entirety stated: "It is my medical recommendation that this patient reduce involuntary electromagnetic exposure including wireless transmissions." PECO Exh. BU-1, p. 1; PECO Exh. BU-6.
40. In June 2015, PECO sent its "proactive" letter to the Quigley's stating that it needed to install a gas AMI module at their residence. Apr 17 Tr. 181, 200; PECO Exh. BU-1, p. 2.
41. In July 2015, Mr. Quigley called PECO and stated that the Quigley's refused to accept a gas AMI module for health reasons, and would send a doctor's letter supporting that refusal. Apr 17 Tr. 201, PECO Exh. BU-1, p. 2.
42. In January 2016, PECO sent a re-engagement letter to the Quigley's to reinitiate discussions on electric AMI meter installation. Apr 17 Tr. 181-82.

43. On September 26, 2016, PECO sent the Quigley's a further re-engagement letter regarding installation of AMI technology at their home. Apr 17 Tr. 182-83; PECO Exh. BU-1, p. 8; PECO Exh. BU-8.
44. On September 28, 2016, PECO installed a gas AMI module. At the time of installation of the gas AMI module, the Quigley's did not have a formal complaint pending. Apr 17 Tr. 182-83, 198; 202.
45. On October 24, 2016, PECO received a letter from the Quigley's stating that they did not want to have a "smart" meter attached to their house. This letter stated the Quigley's had previously sent a "doctor's note stating that given my health condition, he did not feel that I should have increased exposure to electric magnetic fields." Apr 17 Tr. 209; PECO Exh. BU-10.
46. On July 10, 2017, PECO sent the Quigley's a residual deployment letter stating that it needed to proceed with installation of an AMI electric meter. PECO Exh. BU-1, p. 18.
47. On July 11, 2017, PECO sent the Quigley's a 10-day notice stating that, if they did not provide access to install an electric AMI meter, PECO would terminate their service. PECO Exh. BU-13.
48. On July 31, 2017, PECO sent the Quigley's a 72-hour notice stating that, if they did not provide access to install an electric AMI meter, PECO would terminate their service. PECO Exh. BU-14.
49. On August 4, 2017, PECO was served with the formal complaint in this matter. PECO Exh. BU-1, p. 25.

Testimony of Glenn Pritchard.

50. Glenn Pritchard is PECO's Manager of Advanced Grid Operations. Apr 17 Tr. 215.

51. Mr. Pritchard was recognized as an expert in the design, operation, and technology of Advanced Meter Installations. Apr 17 Tr. 216-17; PECO Exh. GP-1.
52. From approximately 2000 until April 2017, PECO used an AMR meter system that was comprised of transmit-only meters that transmitted using radio frequencies. That system was shut down in April 2017. Approximately 1.7 million electric AMR meters and 500,000 gas AMR meters were deployed. Apr 17 Tr. 217-219; PECO Exh. GP-2.
53. The Quigley's had AMR meters for both their gas and their electric service. Apr 17 Tr. 219-20.
54. The AMR meters transmitted every five minutes, or 288 times per day, for 20 milliseconds per transmission, for a total of 5.76 seconds of transmission time per day. Apr 17 Tr. 219-20; PECO Exh. GP-3.
55. PECO has three electric AMI meter types available for deployment on its AMI system: (1) the Landis + Gyr meter, which has a FlexNet module to communicate with the PECO backbone and a ZigBee radio to communicate with devices inside the home; (2) the Aclara meter, which has a FlexNet module but not a ZigBee radio; and (3) a Sensus Stratus meter, which has a FlexNet module and ZigBee radio that can be remotely turned on and off. Apr 17 Tr. 221-223.
56. The total transmission of an electric AMI meter varies depending upon whether the meter has a ZigBee radio or not, and whether the ZigBee radio is activated. The FlexNet module transmits six to eight times per day for approximately 70 milliseconds. The ZigBee, if present and activated, transmits every 30 seconds until it pairs with a device. The total transmission time of the two radios is approximately 2.5 seconds per day. Apr 17 Tr. 224; PECO Exh. GP-4.

57. Gas AMI modules transmit even less frequently than electric AMI meters. The gas AMI modules do not have a ZigBee radio, and transmit six times a day for a total transmission time of less than ½ second. Apr 17 Tr. 225-26.
58. When PECO receives the electric AMI meters from the manufacturer, they are set to transmit every 90 minutes. PECO then has a process for “tuning down” the number of transmissions to the lowest number that will allow reliable transmission of the data. Apr 17 Tr. 225-26.
59. The AMI metering systems in use in California, which were referenced in the CCST report discussed by Mr. Quigley, are “mesh” systems that have different operating characteristics that result in a much higher transmission rate than PECO’s system, which is not a mesh system. Apr 17 Tr. 228-233.
60. As an accommodation, PECO will work with the customers to relocate their meter board and connect PECO service to the newly located meter board at a location more distant from the residence. Apr 17 Tr. 233-34.
61. PECO’s Tariff allows for commercial competitors, referred to as Advanced Meter Service Providers, to enter the market and provide alternative metering services after receiving a license from the Commission. None have done so to date. Apr 17 Tr. 233-34, 258-59.
62. PECO provided an accommodation to the Quigley’s by delaying installation of their AMI meter from 2012, when deployment began, until today. However, because the AMR system was decommissioned, that accommodation is no longer available. Apr 17 Tr. 235.
63. PECO chose its non-mesh design for the AMI system for operational reasons, but it was also chosen as an accommodation that had the best features to serve PECO’s customers while still complying with the Commission’s AMI implementation orders. Apr 17 Tr. 236-37.

64. PECO's offering of the Aclara meter, which does not have a ZigBee radio, and the Sensus Stratus meter, which has a ZigBee radio that can be remotely deactivated, are an accommodation to customers who have concerns about radiofrequency transmissions. Apr 17 Tr. 237-38; Apr 18 Tr. 247. This accommodation is available to the Quigley's, who can choose among the three available electric AMI meter types. Apr 18 Tr. 260-61. The Quigley's were informed about the option of choosing an Aclara meter in February 2017. Apr 18 Tr. 262-63.
65. The signal from the FlexNet communication module in all three PECO AMI electric meter types is designed to transmit away from the house, not into it. In addition, the meter socket and walls provide shielding of any transmissions toward the house. Consequently, the amount of radiofrequency transmissions that go into the house are very minimal, similar to the background levels that are already there today. Apr 18 Tr. 250-51.
66. Although some PECO AMI electric meters can receive a "hop" transmission from a single nearby neighboring meter, the Quigley residence will neither send a hop transmission nor receive a hop transmission from neighboring meters. Apr 18 Tr. 256-57.
67. Prior to the installation of the gas AMI module, the Quigley gas meter had an AMR communication module. Apr 18 Tr. 259-60.

Testimony of Christopher Davis, Ph.D.

68. Dr. Christopher Davis is a Ph.D. physicist who is the Minta Martin Professor of Engineering and Professor of Electrical and Computer Engineering at the University of Maryland. Apr 18 Tr. 340-41; PECO Exh. CD-1.

69. Dr. Davis was recognized as an expert in the fields of physics, biophysics, chemistry, electrical engineering, electromagnetics, bioelectromagnetics, and dosimetry. Apr 18 Tr. 331-34.
70. PECO's AMI meters do not produce pulsed fields. Apr 18 Tr. 278.
71. The FCC has safety standards that explain the maximum permissible exposure ("MPE") that people can be exposed to if they are near a radiofrequency transmitter. The FCC's MPEs are designed to avoid human health effects from exposure to high levels of radiofrequency fields. Exposures below the MPE levels do not cause health effects. Apr 18 Tr. 278-79; PECO Exh. CD-3.
72. PECO's AMI meters do not create ionizing radiation and the transmissions from them are not capable of breaking chemical bonds. Apr 18 Tr. 279-81, 302; PECO Exh. CD-4.
73. The radiofrequency transmissions from PECO's AMI meters are millions of times lower than the FCC's MPE. Apr 18 Tr. 281-84; PECO Exh. CD-5; PECO Exh. CD-6; PECO Exh. CD-7.
74. The FCC's MPE's are calculated on an average exposure basis. Even the instantaneous peak transmissions from a PECO AMI meter are approximately 40 times smaller than the amount they are allowed to transmit on an averaged basis. Apr 18 Tr. 284; PECO Exh. CD-8.
75. The radiofrequency transmissions from PECO's AMI meters are approximately 4.4 million times lower than the guidelines of the International Commission on Non-Ionizing Radiation Protection. Apr 18 Tr. 284-85; PECO Exh. CD-9.
76. People are commonly exposed to radiofrequency fields from a variety of sources, including such common devices as cell towers, UHF transmitters, cell phones, and microwave ovens. Apr 18 Tr. 285-86; PECO Exh. CD-10.

77. The Quigley residence is continuously exposed to radiofrequency transmissions from UHF TV transmitters. At the Quigley residence, the background exposure to radio frequency fields from UHF stations is 1,600 times larger than the exposure of continuously sitting one meter in front of an AMI meter 24/7. Apr 18 Tr. 286-87; PECO Exh. CD-11.
78. PECO's AMI meters will reduce the radiofrequency exposure from PECO's existing AMR meters by 79%. Apr 18 Tr. 287; PECO Exh. CD-12.
79. In Dr. Davis's opinion, (1) the levels of the radiofrequency fields from PECO's AMI meters comply with the FCC's safety limits; and (2) there is no reliable scientific basis to conclude that radiofrequency fields from PECO's AMI meters are capable of producing any adverse biological effects. Apr 18 Tr. 288; PECO Exh. CD-14.
80. Based on Mrs. Mendez-Quigley's testimony regarding her cell phone usage, Dr. Davis conservatively estimated that she is getting 10 times as much radiofrequency exposure from her phone as she would from a PECO AMI meter. Apr 18 Tr. 295.
81. Dr. Davis has examined each of the components and operations of PECO's AMI meters, and there is nothing about those components or operations that is capable of causing adverse biological effects. Apr 18 Tr. 297.
82. The proton energy in radiofrequency fields from PECO's AMI meters is not large enough to affect telomere repair. This view is held by a general consensus of scientists. Apr 18 Tr. 304.

Testimony of Mark Israel, M.D.

83. Mark Israel is a medical doctor who is Professor at Dartmouth Medical School. He is also Executive Director of the Israel Cancer Research Fund. Apr 18 Tr. 341; PECO Exh. MI-1.

84. Dr. Israel was recognized as an expert in medicine, medical research, radiofrequencies, and electromagnetic fields and health. Apr 18 Tr. 342-43.
85. Dr. Israel reviewed the scientific research literature that examines the question of whether there is a relationship between exposure to radiofrequency fields or other frequencies of EMF and the medical claims set forth in the Quigley's complaint. Apr 18 Tr. 343-44; PECO Exh. MI-2.
86. Based on his review of the scientific research, Dr. Israel concluded that there is no reliable medical basis to conclude that radiofrequency fields from PECO's AMI or AMI meters cause, contribute to, or exacerbate Sjoren's syndrome, Apr 18 Tr. 343-35; Vitamin D deficiency and osteoporosis, Apr 18 Tr. 345-46; neuropathy, Apr 18 Tr. 346-47; lymphoma or other cancers, Apr 18 Tr. 347-48; cardiovascular disease, Apr 18 Tr. 348-50; or any other adverse health effect. Apr 18 Tr. 350-51.

Summary of Argument

Complainants have the burden of proof in this proceeding. After a full, two-day, evidentiary hearing, the Quigley's did not prove their claims by a preponderance of the evidence. To the contrary, PECO provided substantial, persuasive evidence that its AMI meters and will not cause, contribute to, or exacerbate harm to Mrs. Mendez-Quigley's health. Therefore, the Quigley's Complaint should be dismissed.

Argument

I. Burden of Proof – The Complainants Have the Burden of Proof

It is axiomatic in all Commission formal complaint proceedings that the Complainant has the burden of proof. *Samuel J. Lansberry, Inc. v. Pa. PUC*, 578 A.2d 600 (Pa. Cmwlth. 1990), *alloc. denied*, 529 Pa. 654, 602 A.2d 863 (1992).

The Commission has affirmed that this normal burden of proof rule applies to AMI/health claims. *Kreider v PECO*, P-2015-2495064 (Opinion and Order, January 28, 2016) (pp. 22-23); *Frompovich v PECO*, C-2015-2474602 (Opinion and Order, May 3, 2018) (pp. 12-14); *Mary Paul v PECO*, C-2015-2475355 (Opinion and Order, June 14, 2018) (pp. 11-13).

The Quigley's claim that installation of an AMI meter will cause harm to Mrs. Mendez-Quigley's health. In order to prevail, the Quigley's must prove that claim by a preponderance of the evidence. As demonstrated in the remainder of this Brief, they did not do so.

II. The Complainants' testimony did not demonstrate that PECO's AMI meter will cause harm to Mrs. Mendez-Quigley's health

A. Mrs. Mendez-Quigley's Testimony

Mrs. Mendez-Quigley testified that she currently suffers from Sjogren's syndrome, Vitamin D deficiency, and some other ailments, and that she is concerned that exposure to radiofrequency fields from PECO's AMI meters will worsen her Sjogren's symptoms, will impair her ability to synthesize Vitamin D, and could exacerbate her other ailments. Apr 17 Tr. 55-58.

However, Mrs. Mendez-Quigley did not herself testify regarding any scientific research or other scientific basis for such concerns. Instead, she deferred to her husband's testimony to establish the claim that PECO's AMI meters will cause harm. *See, for example*, Apr 17 Tr. 47 (stating in the context of a discussion of Sjogren's syndrome that "radiofrequencies can cause

harm, according to the literature and that's something that Jim Quigley will testify to later"); Apr 17 Tr. 59 (discussing the general claim that AMI meters cause harm and stating "Mr. Quigley will be able to talk more about what the peer-reviewed literature has said.")

Mrs. Mendez-Quigley's testimony thus does not provide any evidentiary support for the claim that PECO's AMI meters will cause her harm.

B. Mr. Quigley's Testimony

Mr. Quigley was not offered as an expert in any field, nor was he recognized as an expert.

Mr. Quigley reviewed published research on radiofrequency fields and numerous health endpoints and has formed a concern that exposure to radiofrequency fields is harmful to human health in those areas. His review, and his concerns, involves the immune system, Apr 17 Tr. at 73-86; Vitamin D synthesis; Apr 17 Tr. at 98-102; cardiovascular endpoints, Apr 17 Tr. at 102-104; and neuropathy. Apr 17 Tr. at 102-130-131.

This non-expert testimony was outweighed by the testimony of PECO's experts.

III. PECO provided substantial, persuasive testimony that its AMI meters will not cause harm to Mrs. Mendez-Quigley's health

A. Dr. Davis's Testimony

Dr. Christopher Davis is a Ph.D. physicist who is the Minta Martin Professor of Engineering and Professor of Electrical and Computer Engineering at the University of Maryland. Apr 18 Tr. 340-41; PECO Exh. CD-1. He was recognized, without objection, as an expert in the fields of physics, biophysics, chemistry, electrical engineering, electromagnetics, bioelectromagnetics, and dosimetry. Apr 18 Tr. 331-34.

Dr. Davis testified that:

- The FCC has safety standards that explain the maximum permissible exposure ("MPE") that people can be exposed to if they are near a radiofrequency transmitter. The FCC's MPEs are designed to avoid human health effects from exposure to high levels of

radiofrequency fields; conversely, exposures below the MPE levels do not cause health effects. Apr 18 Tr. 278-79; PECO Exh. CD-3.

- The radiofrequency transmissions from PECO's AMI meters are millions of times lower than the FCC's MPE, whether calculated on an average exposure or peak exposure basis. Apr 18 Tr. 281-84; PECO Exh. CD-5; PECO Exh. CD-6; PECO Exh. CD-7. PECO Exh. CD-8.
- People are commonly exposed to radiofrequency fields from a variety of sources, including such common devices as cell towers, UHF transmitters, cell phones, and microwave ovens. Apr 18 Tr. 285-86; PECO Exh. CD-10.
- The Quigley residence is continuously exposed to radiofrequency transmissions from UHF TV transmitters. At the Quigley residence, the background exposure to radio frequency fields from UHF stations is 1,600 times larger than the exposure of continuously sitting one meter in front of an AMI meter 24/7. Apr 18 Tr. 286-87; PECO Exh. CD-11.
- PECO's AMI meters will reduce the radiofrequency exposure from PECO's existing AMR meters by 79%. Apr 18 Tr. 287; PECO Exh. CD-12.
- Based on Ms. Mendez-Quigley's testimony regarding her cell phone usage, Dr. Davis conservatively estimated that she is getting 10 times as much radiofrequency exposure from her phone as she would from a PECO AMI meter. Apr 18 Tr. 295
- In Dr. Davis's opinion, (1) the levels of the radiofrequency fields from PECO's AMI meters comply with the FCC's safety limits; and (2) there is no reliable scientific basis to conclude that radiofrequency fields from PECO's AMI meters are capable of producing any adverse biological effects. Apr 18 Tr. 288; PECO Exh. CD-14.

B. Dr. Israel's Testimony

Mark Israel is a medical doctor who, at the time of hearing, was a Professor at Dartmouth Medical School. At the time of the hearing he was, and currently is, Executive Director of the Israel Cancer Research Fund. Apr 18 Tr. 341; PECO Exh. MI-1.

Dr. Israel was recognized, without objection, as an expert in medicine, medical research, radiofrequencies, and electromagnetic fields and health. Apr 18 Tr. 342-43.

Dr. Israel reviewed the scientific research literature that examines the question of whether there is a relationship between exposure to radiofrequency fields or other frequencies of EMF

and the medical claims set forth in the Quigley's complaint. Apr 18 Tr. 343-44; PECO Exh. MI-2.

Based on his review of the scientific research, Dr. Israel concluded that there is no reliable medical basis to conclude that radiofrequency fields from PECO's AMI or AMI meters cause, contribute to, or exacerbate Sjogren's syndrome, Apr 18 Tr. 343-35; Vitamin D deficiency and osteoporosis, Apr 18 Tr. 345-46; neuropathy, Apr 18 Tr. 346-47; lymphoma or other cancers, Apr 18 Tr. 347-48; cardiovascular disease, Apr 18 Tr. 348-50; or any other adverse health effect. Apr 18 Tr. 350-51.

C. PECO has provided reasonable accommodations to the Mendez-Quigley's

In the seminal *Kreider Order* which precipitated AMI/health hearings in Pennsylvania, the Commission indicated that one purpose of allowing AMI/health hearings is to determine whether PECO offered reasonable accommodations to customers, such as the Mendez-Quigley's, who are concerned about radiofrequency fields from PECO's AMI meters (p. 23, fn. omitted):

PECO essentially argues that the Commission cannot grant the Complainant any conceivable remedy, and therefore, the Complainant should not receive a hearing. In our view, this analysis puts the cart before the horse. *It only becomes necessary to reach a determination regarding the remedies available to the Complainant in this case if the ALJ finds, after a full evidentiary hearing, that the facts establish a violation of the Code, a Commission Order, or Regulation.*¹ Given the state of the record at this point in the proceeding, we believe it is premature to conclude that the facts and the law absolutely preclude any possible remedy. *It may be possible, for example, for the Respondent to install the smart meter in a different location other than outside of the Complainant's bedroom or to use a different type of smart meter at this Complainant's home.* In any event, it is for the ALJ to determine what remedy to recommend, in the event that she finds a violation after a full evidentiary hearing.

¹ PECO notes that the Mendez-Quigley's have not "establish[ed] a violation of the Code, a Commission Order, or Regulation," and that the *Kreider* requirement to review accommodations therefore is not truly applicable, given the record in this proceeding. Nonetheless, PECO remains committed to the accommodations that it offered at hearing.

Kreider v PECO, P-2015-2495064 (Opinion and Order, January 28, 2016) (pp. 23, fn omitted).

This issue of accommodations was addressed in the testimony of Mr. Glenn Pritchard, who is PECO's Manager of Advanced Grid Operations and who was recognized, without objection, as an expert in the design, operation, and technology of Advanced Meter installations.

Apr 12 Tr. 141-46. Mr. Pritchard provided the following testimony on accommodations:

- As an accommodation, PECO will work with the customers to relocate their meter board and connect PECO service to the newly located meter board at a location more distant from the residence. Apr 17 Tr. 233-34.
- PECO's Tariff allows for commercial competitors, referred to as Advanced Meter Service Providers, to enter the market and provide alternative metering services after receiving a license from the Commission. None have done so to date. Apr 17 Tr. 233-34, 258-59.
- PECO provided an accommodation to the Quigley's by delaying installation of their AMI meter from 2012, when deployment began, until today. However, because the AMR system was decommissioned, that accommodation is no longer available. Apr 17 Tr. 235.
- PECO chose its non-mesh design for the AMI system for operational reasons, but it was also chosen as an accommodation that had the best features to serve PECO's customers while still complying with the Commission's AMI implementation orders. Apr 17 Tr. 236-37.
- When PECO receives the electric AMI meters from the manufacturer, they are set to transmit every 90 minutes. PECO then has a process for "tuning down" the number of transmissions to the lowest number that will allow reliable transmission of the data. Apr 17 Tr. 225-26. This reduction in transmission periodicity is also an accommodation to customers.
- PECO's offering of the Aclara meter, which does not have a ZigBee radio, and the Sensus Stratus meter, which has a ZigBee radio that can be remotely deactivated, are an accommodation to customers who have concerns about radiofrequency transmissions. Apr 17 Tr. 237-38; Apr 18 Tr. 247. This accommodation is available to the Quigley's, who can choose among the three available electric AMI meter types. Apr 18 Tr. 260-61.

Conclusion

PECO respectfully submits that the Quigley's did not prove, by a preponderance of the evidence, that PECO's AMI meters will cause, contribute to, or exacerbate harm to Mrs. Mendez-Quigley's health. To the contrary, PECO provided substantial, persuasive evidence that its AMI meters will not cause, contribute to, or exacerbate harm to Mrs. Mendez-Quigley's health. Therefore, the Quigley's Complaint should be dismissed.

Respectfully submitted,



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