

HECO T-11  
DOCKET NO. 03-0XXX

TESTIMONY OF  
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VICE PRESIDENT  
GOVERNMENT AND COMMUNITY AFFAIRS  
HAWAIIAN ELECTRIC COMPANY, INC.

Subject: EMF Policy



1 Application in this proceeding .

2 Q. Why has there been public concern about EMF?

3 A. EMF gained significant public attention with the publication in 1979 of an  
4 epidemiological report by Dr. Nancy Werthheimer and Mr. Ed Leeper, indicating  
5 an association between “wiring configuration codes” and higher risk of childhood  
6 leukemia in Denver, Colorado. Numerous studies since then have attempted to  
7 refine the measurement of exposure and identify a cause and effect relationship  
8 with various adverse health effects. No such relationship has yet been identified  
9 and validated. A more detailed description of studies and findings is provided in  
10 section 4.21.2.5 of the Kamoku-Pukele 138kV Transmission Line Project RFEIS,  
11 provided as Exhibit 4 to the Application in this proceeding. Notwithstanding the  
12 unsuccessful effort to establish a consistent relationship between EMF and  
13 increased health risk, public concern does continue. Although HECO receives  
14 inquiries periodically on the subject, interest is greatest when planning and design  
15 are underway for a transmission project and the project is awaiting regulatory  
16 review and approval prior to construction.

17 Q. What are the basic considerations to be addressed in a discussion of EMF?

18 A. There are two. The first is an examination of the level of exposure, either as  
19 measured (for existing electrical facilities) or as modeled (for future facilities).  
20 This consideration is discussed at length by Mr. Silva in his testimony HECO  
21 T-10. The second is potential health effects, as identified above.

22 Q. Has the Hawaii Public Utilities Commission addressed the issue of EMF in  
23 previous transmission line proceedings?

24 A. Yes. In March 1992, HECO filed an application for approval to commit funds in  
25 excess of \$500,000 for construction of Waiiau-CIP 138 kV #1 & #2, Part 2,

1 Transmission Lines (Docket No. 7256). EMF was among the many issues  
2 considered in the evidentiary proceedings under this docket.

3 Q. What testimony was presented on the subject of health effects in that proceeding?

4 A. Among the experts presented by HECO were:

5 1) Dr. Howard Wachtel, a professor of electrical engineering at the

6 University of Colorado and participant in several EMF

7 epidemiological studies, who testified that it is very unlikely that the

8 magnetic fields typically produced by power lines are a cause of

9 cancer or other serious health effects;

10 2) Dr. Darwin Labarthe, a medical doctor, epidemiologist, and professor

11 at the University of Texas Health Science Center in Houston, Texas,

12 who testified that, based on his review of the epidemiological

13 literature on EMF, he could not conclude that exposure to EMF causes

14 adverse health effects, including cancer; and

15 3) Dr. Richard Bockman, a medical doctor and biochemist at the Cornell

16 University for Special Surgery and professor at Cornell University

17 Medical College, who testified that, based on his review of the

18 scientific literature on EMF, he concluded that while exposure to

19 some levels of EMF may cause subtle biological responses in some

20 individuals, he could not conclude that these biological responses are

21 associated with any adverse health effects on reproduction, growth

22 and development, circadian rhythms, hormonal function in the body,

23 neurological function, calcium function, or the immune system.

24 Q. What did the Public Utilities Commission conclude from the testimony presented  
25 on health effects of EMF?

- 1       A.    In its Decision and Order No. 13201, issued on April 7, 1994 in Docket No. 7256,  
2            the Commission found, in part, that “Based upon a thorough examination of all of  
3            the evidence presented in this docket with regard to the possible health effects of  
4            exposure to EMF, we find that a causal link between EMF and adverse health  
5            effects has yet to be established by those in the scientific community who have  
6            been researching this matter.” D&O 13201 (p. 34)
- 7        Q.    Have significant studies on the potential health effects of EMF been conducted  
8            since the Hawaii Public Utilities Commission issued its Decision and Order No.  
9            13201 in 1994?
- 10       A.    Yes. Several of these were reported in section 4.21.2.5 of the Kamoku-Pukele  
11            138kV Transmission Line Project RFEIS, provided as Exhibit 4 to the Application  
12            in this proceeding. Additional studies have been completed since that document  
13            was accepted by the Department of Land and Natural Resources in December  
14            2000.
- 15       Q.    Do the findings of studies reported in the RFEIS alter scientific consensus on the  
16            subject of health effects from EMF?
- 17       A.    No. These studies, reviews and reports do not establish a cause and effect  
18            relationship between EMF and any health outcome. The conclusion reached by  
19            the U.S. National Institute of Environmental Health Sciences (NIEHS) is typical:  
20            “NIEHS concludes that ELF-EMF exposure cannot be recognized as entirely safe  
21            because of weak scientific evidence that exposure may pose a leukemia hazard. In  
22            our opinion, this finding is insufficient to warrant aggressive regulatory concern.”
- 23       Q.    Can you identify and summarize significant study results since the RFEIS was  
24            submitted?
- 25       A.    Yes. There are four.

- 1                   1)    In 2002, the NIEHS released an updated edition of key questions and  
2                                    answers, concluding that "...limited evidence exists for an association  
3                                    between EMF exposure and increased leukemia risk, but when all the  
4                                    scientific evidence is considered, the link between EMF exposure and  
5                                    cancer is weak."
- 6                   2)    Also in 2002, the International Agency for Research on Cancer  
7                                    (IARC) released a monograph, concluding that "extremely low-  
8                                    frequency magnetic fields are possibly carcinogenic to humans."
- 9                   3)    Also in 2002, the California Department of Health Services (CDHS)  
10                                   reported the opinions of three of their scientists on various EMF-  
11                                   related subjects. The most significant finding was a belief by all three  
12                                   "that EMFs can cause some degree of increased risk of childhood  
13                                   leukemia, adult brain cancer, Lou Gehrig's Disease, and miscarriage."  
14                                   These conclusions were subsequently challenged by the Minnesota  
15                                   Department of Health.
- 16                   4)    In May 2003, the U.K. National Radiological Protection Board  
17                                   (NRPB) published "Proposals for Limiting Exposure to  
18                                   Electromagnetic Fields". In this document, NRPB concludes that  
19                                   "...the results of epidemiological studies, taken individually or as  
20                                   collectively reviewed by expert groups, cannot be used as a basis for  
21                                   the derivation of quantitative limits on exposure to EMFs."

22           Q.    Are there EMF design standards to guide the utility in its transmission planning  
23                   and design?

24           A.    There are no national standards in the United States for electric or magnetic field  
25                   exposure. A few states have some type of electric field guideline, and two states

1 have a magnetic field standard. The purpose of these standards is to maintain the  
2 field levels from new lines similar to levels from existing lines. The International  
3 Non-Ionizing Radiation Committee of the International Radiation Protection  
4 Association has published "Interim Guidelines on Limits of Exposure to 50/60 Hz  
5 Electric and Magnetic Fields."

6 Q. What policy does HECO follow in its consideration of EMF relative to  
7 transmission project planning?

8 A. HECO follows a policy of "Prudent Avoidance" in its transmission facility  
9 planning. The concept of prudent avoidance was set forth by Dr. Granger Morgan  
10 of Carnegie Mellon Institute in 1989 in a study published under contract to the  
11 U.S. Congress Office of Technology Assessment. The concept was adopted by the  
12 State of Hawaii Department of Health in their policy position paper as set forth in  
13 Exhibit HECO-1101. A definition for prudent avoidance (which was put forth by  
14 the U.S. Environmental Protection Agency) was adopted by the Hawaii Public  
15 Utilities Commission in its Decision and Order No. 13201 in Docket No. 7256 as  
16 follows:

17  
18 "Prudent avoidance is an approach to making decisions  
19 about risks. This decision-making process is based on  
20 judgment and values, can be applied to groups and  
21 individuals, and can be considered for all aspects of our  
22 lives, not just EMFs. Prudent avoidance applied to EMFs  
23 suggests adopting measures to avoid EMF exposures  
24 when it is reasonable, practical, relatively inexpensive and  
25 simple to do so. This position or course of action can be  
26 taken even if the risks are uncertain and even if safety  
27 issues are unresolved." D&O 13201 (p. 35)

28 Q. Has the Public Utilities Commission subsequently applied the policy of prudent  
29 avoidance to EMF?

1 A. The Public Utilities Commission subsequently reaffirmed the application of this  
2 definition of “prudent avoidance” to EMF in both its Decision and Order No.  
3 13517 (August 29, 1994) in Docket No. 94-0043 and Decision and Order No.  
4 15037 (September 27, 1996) in Docket No. 96-0016. Both of these decisions  
5 state,

6  
7 “In Decision and Order No. 13201, Docket No. 7256  
8 (1994), we concluded that a causal link between EMF and  
9 adverse health effects has yet to be established by the  
10 scientific community. We acknowledged that a few  
11 studies appear to have established an association between  
12 EMF exposure and the occurrence of certain cancers.  
13 However, we found that the results of these studies have  
14 yet to be accepted by the scientific community as proof  
15 that exposure to EMF causes cancer or other disease.  
16 Nevertheless, we expressed our expectation that a utility  
17 will exercise prudent avoidance with respect to EMF. We  
18 adopted the United States Environmental Protection  
19 Agency’s definition of prudent avoidance as set forth in  
20 their Questions and Answers about Electric and Magnetic  
21 Fields (EMF), 402-R-92-009 (1992). As defined there,  
22 prudent avoidance applied to EMFs means adopting  
23 measures to avoid EMF exposures ‘when it is reasonable,  
24 practical, relatively inexpensive and simple to do.’”

25 (See Decision and Order No. 13517 at page 9; Decision and Order No. 150037 at  
26 page 10.) The Hawaii Supreme Court has approved the Public Utilities  
27 Commission’s adoption and application of the “prudent avoidance” standard and  
28 has acknowledged the Public Utilities Commission’s recognition that the “health  
29 effects of EMF are uncertain.” In re Hawaiian Electric Company, Inc., 81 Haw.  
30 459, 918 P.2d 561 (1996).

31 Q. How has the prudent avoidance policy been applied to planning for the East Oahu  
32 Transmission Project?

1 A. As described in Mr. Wong's testimony HECO T-2, EMF exposure mitigation is  
2 being considered in the routing of the proposed lines. HECO will also apply  
3 prudent avoidance in its engineering design for ductlines with multiple circuits by  
4 implementing the EMF mitigation identified by Mr. Silva in his testimony, HECO  
5 T-10. EMF mitigation can be achieved in engineering design by optimizing the  
6 cable placement and phasing arrangement within the cable ducts. HECO intends  
7 to implement these mitigation recommendations, which can reduce EMF levels  
8 for multiple circuit power lines.

9

10

SUMMARY

11

Q. Please summarize your testimony.

12

A. Scientific and medical studies subsequent to the 1994 Decision and Order No.  
13 13201 in Docket No. 7256 by the Hawaii Public Utilities Commission have not  
14 established a cause and effect relationship between EMF and any adverse health  
15 risk. Therefore, the policy of prudent avoidance, established by the State of  
16 Hawaii Department of Health and defined by the Public Utilities Commission for  
17 exposure to EMF, remains valid. HECO has applied the concept of prudent  
18 avoidance in its routing and design of the lines associated with the East Oahu  
19 Transmission Project.

20

Q. Does this conclude your testimony?

21

A. Yes, it does.

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