

EVALUATION OF CONSUMER-GRADE EXTREMELY LOW-FREQUENCY (ELF) METERS



PROJECT HIGHLIGHTS

- Independent evaluation of consumer-grade ELF EMF meters:
 - Review of specifications
 - General performance
 - Measurement accuracy
- Informs utility communications with the public regarding EMF measurements and risks.

Background, Objectives, and New Learnings

The EPRI P60 EMF/RF Health Assessment and Safety Program has been actively involved in the research and evaluation of power frequency magnetic fields for several decades. This research has included magnetic field measurements throughout the United States, Canada, Europe, and other countries throughout the world. Measurement and computer modeling surveys, technical reports, and papers on the results of these studies have been published.

Because of the evolution of the internet, availability of information, and public concern, many individuals purchase economical, consumer-grade extremely low-frequency magnetic field meters, typically costing less than \$500, to perform their own personal field measurements in their homes and workplaces. The public may ask electromagnetic field (EMF) issue managers about readings made using these consumer-grade meters. When differences in measurements are obtained between these consumer-grade meters and research-grade meters, it remains unclear whether the differences may be due to the performance of the meter. Therefore, an assessment of the meters in a controlled setting may help EMF issue managers and the public understand the results obtained when different meters are used.

The objective of this project is to identify and evaluate these consumer-grade meters and to characterize the specifications and accuracy associated with these meters.

This study intends to provide electric utility representatives with information that they may use to inform their communication with members of the public when questions arise about EMF meters and measurements.

The study intends to provide insights to EPRI regarding the accuracy level of different instruments and the factors that may affect their performance. These learnings are expected to inform future P60 research, and new learnings can be shared in collaboration with other EPRI members around the world so that improvements can be made in the communication of EMF risks to the public.

Benefits

- Improve the understanding of the accuracy level of consumer-grade instruments and the factors that may affect their performance.
- Research results will inform utility communication with members of the public.

Project Approach and Summary

1. Identify and Select Economic Magnetic Field Meters

A review is intended to be conducted of online sites and sellers available to the public to identify the variety of personal magnetic field meters available for purchase. Once a list has been compiled, a number of the most popular and commonly available magnetic field meters will be selected for purchase. In some instances, two meters from the same manufacturer and model type may be selected from different retail sources in order to characterize different manufacturing lots (to determine the consistency of the same meter over different manufacturing lots).

2. Develop a Characterization Protocol

A measurement protocol is intended to be developed to characterize the accuracy and reliability of the selected personal magnetic field meters. The protocol will account for the various specifications of the different meters and their characteristics.

The characterization protocol may include magnetic field measurements at predefined levels (to be determined based on the various ranges of the meters being tested). Typically, a measurement would be performed within each range for each meter.

3. Perform Testing

Once the meters have been purchased and the protocol specifications defined, each meter is intended to be tested according to the protocol. Measurement results will be recorded in a systematic manner to make comparisons between the various meters. It is intended that calibration equipment would conform to IEEE Standard 644-1994.

4. Develop Technical Report

A technical report will be prepared for this assessment. The report may include descriptions of the various magnetic field meters tested, the design and development of the assessment protocol, and the results of that assessment.

A webinar will be conducted with the funders of the project to communicate the results and to provide a forum for further discussion.

Deliverables

Technical Report and Webcast. The non-proprietary results of this work will be incorporated into EPRI R&D Program P60, and made available to the public, for purchase or otherwise.

Price of Project

\$35k per funder – minimum of three funders required. Qualifies for Self-Directed Funding (SDF).

Project Status and Schedule

12 months

Who Should Join

EMF issue managers, environment managers, industrial hygienists, or engineers who are responsible for conducting EMF measurements.

Contact Information

For more information, contact the EPRI Customer Assistance Center at 800.313.3774 (askepri@epri.com).

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To Join, Contact Your Regional Technical Advisor

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