Aclara's Position on Electromagnetic Fields and the TWACS Technology

Introduction

Electromagnetic fields (EMF) are not new, nor are they an area of natural science that has gone without extensive study. They naturally occur when voltage and current are present, are part of our normal surroundings, and observed in our everyday experience as magnetism, light, heat and static-electricity. Electric fields, generated by voltage, are measured in volts per meters (V/m), while magnetic fields resulting from current flow are measured in units of gauss (G), Amperes/meter, or Tesla (T).

Taken together, all forms of electromagnetic energy, including radio frequencies (RF) and low-frequency EMF, which is the primary focus of this paper, are part of the electromagnetic spectrum. Aclara's TWACS technology products function in relatively narrow bands of the total spectrum…low frequency EMF at 3 to 3,000 Hz. The U.S. Department of Commerce has published a chart that illustrates the complete usable spectrum as established in the United States which can be found at http://www.ntia.doc.gov/files/ntia/publications/2003-allochrt.pdf.

TWACS Technology Overview

Aclara's TWACS (Two Way Automated Communications System) technology is a power line communication system that is used by over 400 electric utilities to serve more than 15 million metered services worldwide. The TWACS system provides key functions including advanced metering, demand response, outage analysis and restoration support, and distribution automation. TWACS utilizes existing power lines to transmit readings from meters to the utility substation and then back to the utility for processing. TWACS deploys its signals on the fundamental frequency (60 Hz or 50 Hz) of the power line with modulation occurring at the zero crossing of the normal power waveform. Signaling from a meter to the utility only occurs when data is requested by the utility.

Low Frequency EMF

Low frequency EMF (hereafter referred to as EMF) is a form of electromagnetic energy produced by Aclara's TWACS technology equipment. Every electrical device or appliance used in a home or business produces a certain amount of EMF, including such everyday appliances such as washing machines, microwaves and irons. Electric fields are reduced by various materials such as plaster, wood and brick that often comprise walls. However, magnetic fields can pass through most materials. In AMI systems, EMF is similar to RF transmissions in that it is non-ionizing and weakens dramatically as distance increases from the source.

EMF Exposure Limits

Today, there are no federal regulations governing permissible exposure limits to low-frequency EMF and only six states, including Florida, Minnesota, Montana, New Jersey, New York and Oregon have established standards that define maximum exposure limits. But these standards concern exposure to fields produced by 60 Hz high voltage transmission lines, not by in-home electrical equipment which operate far below these limits

Internationally, the International Commission on Non-Ionizing Radiation Protection (ICNIRP), a non-governmental organization recognized by the World Health Organization (WHO), has established

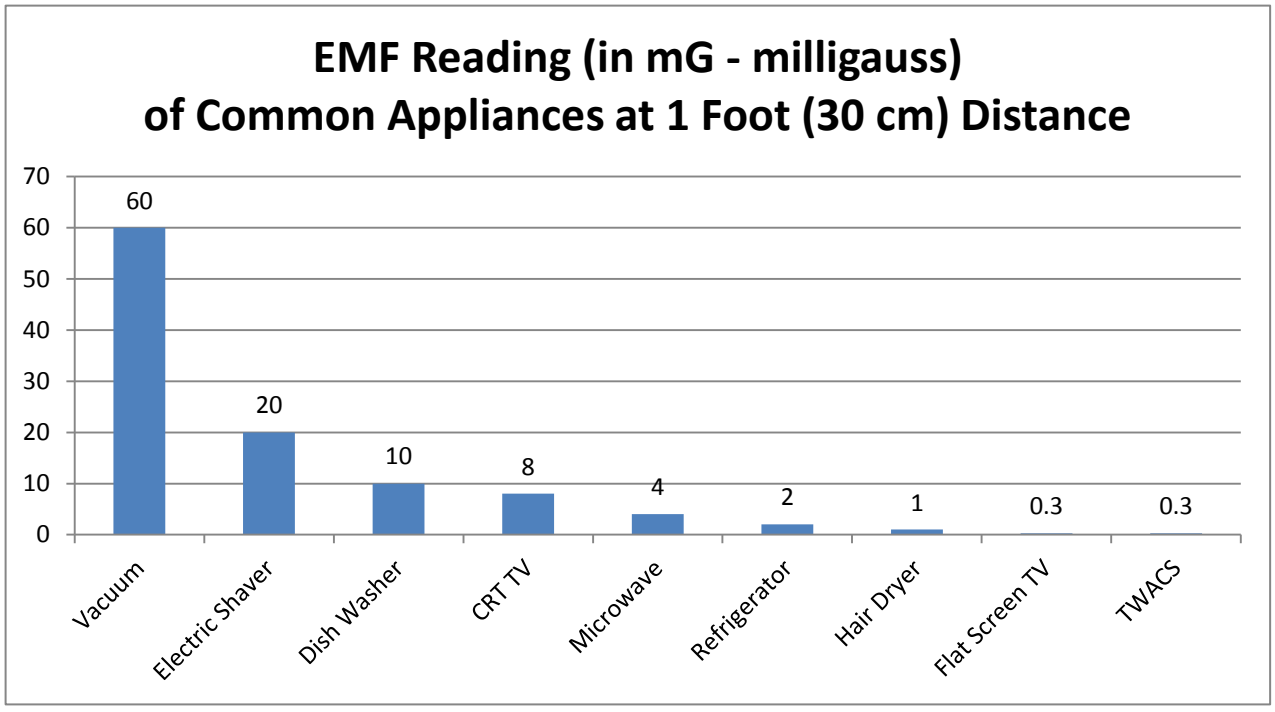
guidelines recommending exposure limits to low frequency EMF. These limits rely on science based evaluations of potential dangers as well as the precautionary principle established by the Treaty of Maastricht.

TWACS Technology Measurements and Standards

Currently there is no U.S. standard for low frequency EMF exposure. The Swedish Confederation of Professional Employees (TCO) established a standard in 1992 recommending limits on EMF emissions of computer monitors, which should produce EMF of no more than 2 mG at a distance of 30 cm (about 12 inches) from the front surface of the monitor and 50 cm (about 20 inches) from the sides and back of the monitor.

As a comparison, the TWACS transponder is well below this recommendation (typically 0.3 mG), with measured EMF that is negligible at one-foot (30 cm) distance. Since the EMF drops with the square of the distance, the EMF readings inside a home due to the TWACS transponder are even lower.

Additionally, a typical TWACS transmission schedule results in less than 32 seconds of transmission time per day. The following chart compares the typical energy resulting from the operation of a TWACS solution with common household appliances. Note that many of these common devices are regularly used for several minutes to several hours per day and represent a portion of the total devices used.



Frequently Asked Questions (FAQs)

The following FAQs answer some of the more common questions received by Aclara about emissions from the company's equipment.

Is the EMF exposure from the TWACS meter dangerous?

Based on technical specifications and expert research to date, Aclara believes there is no danger associated with the EMF exposure from the systems devices. All devices emit a fraction (less than one percent 1%) of the energy considered to be the maximum by the most conservative technical standards. Aclara will continue to review expert studies and findings related to EMF exposure and safety concerns and comply with all existing regulations, standards and guidelines.

With regard to TWACS, is this technology's transponder on and transmitting all the time?

No, the transponder is typically on four (4) times a day and for less than eight (8) seconds per transmission. Even when transmitting, the amount of EMF produced is a fraction of the exposure of many common electrical devices.

Since the TWACS transponder communicates over the power line, does its signaling create EMF in the home?

The TWACS transponder signals travel from the meter to the substation. The TWACS transponder generates about the same EMF at one (1) foot (30 cm) as a flat screen TV at the same distance. However, because TWACS transmissions are very brief and EMF is further reduced in the home as the distance from the meter increases, EMF generated by TWACS inside the home is negligible

Do people get sick from communicating TWACS meters?

The TWACS technology has been in use since the 1990s, when utilities began installing communications modules in meters of many designs to enable remote reading of energy, gas and water usage. Today, more than 15.5 million TWACS-based meters of the more than 65 million communication meters operate in the U.S. and many more installations around the world. No injury or health problems have been documented as a result of device operation. There are currently no studies that show communicating meters can be sensed when communicating, cause illness or pose health risks.

Will meters interfere with medical equipment such as pacemakers?

No. The transmission power levels are too low to affect medical devices. Medical devices, such as pacemakers, are tested to prove they can operate in the presence of moderate EM fields. Many years ago, such testing was not required and there were anecdotal reported incidents of RF interference with some medical equipment such as pacemakers caused by high power sources like microwave ovens.

TWACS based systems currently operate in metropolitan, suburban and rural areas. These serve all building types including homes, hospitals, critical care facilities, universities, military bases and communications centers that deliver phone and data services such as data centers. The devices comply with all relevant standards on interference and emit far lower emissions than many common household, commercial and industrial devices.

Sources and References

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National Institute of Environmental Health Sciences EMF Questions and Answers
https://www.niehs.nih.gov/news/newsroom/releases/2002/october30/index.cfm