

Understanding EMF (Electric and Magnetic Fields)

Questions have been raised about the possible health effects of 60-Hertz (power frequency) electric and magnetic fields (EMF), which are found wherever you have electric power. This article contains information that will help you understand the EMF issue, plus practical tips you can use if you want to reduce your exposure at home and at work.

Can EMF Harm Your Health?

Electric and magnetic fields are present wherever electricity flows—around appliances and power lines, and in offices, schools and homes. Many researchers believe that if there is a risk of adverse health effects from usual residential exposures to EMF, it is probably just at the detection limit of human health studies; nonetheless, the possible risk warrants further investigation. The varying results from epidemiological studies, which looked at estimated EMF exposures and childhood leukemia, are consistent with a weak link. Laboratory studies and studies investigating a possible mechanism for health effects (mechanistic studies) provide little or no evidence to support this weak link.

The results from many research studies have been evaluated by international, national and California EMF research programs to find out if EMF poses any health risk. Given the uncertainty of the issue, the medical and scientific communities have been unable to determine that usual residential exposures to EMF cause health effects or to establish any standard or level of residential exposure that is known to be either safe or harmful. These conclusions remain unchanged by recent studies.

World Health Organization Findings

The World Health Organization (WHO) recently concluded a review of the potential health implications of extremely low frequency (ELF) EMF, which includes power-frequency fields. Their conclusions and recommendations were presented in June 2007 in a report known as the Extremely Low Frequency Fields, Environmental Health Criteria Monograph No. 238.







The WHO report concluded that evidence for a link between ELF magnetic fields and childhood leukemia “is not strong enough to be considered causal but sufficiently strong to remain a concern.” “Virtually all of the laboratory evidence and the mechanistic evidence fail to support” this reported association. For all other diseases, there is inadequate or no evidence of health effects at low exposure levels.

The report emphasized that, given the weakness of the evidence for health effects, the health benefits of exposure reduction are unclear and policies based on the adoption of arbitrary low exposure limits are not warranted. In light of this situation, WHO made these and other recommendations:



- National authorities should implement communication programs with all stakeholders to enable informed decision-making, including how individuals can reduce their own exposure.
- Policy makers and community planners should implement very low-cost measures to reduce exposures when constructing new facilities and designing new equipment, including appliances.

- Policy makers should use existing international guidelines (833 and 9,000 milligauss) to establish standards for exposure to short-term, high-level ELF fields. These guidelines pertain to field levels that are virtually never encountered by the general public except from a few electric appliances.
- Government and industry should promote research to reduce the uncertainty of the scientific evidence on the health effects of ELF field exposure. Several recommended research projects are already under way through the Electric Power Research Institute, of which SCE is a member.

To view the full report and a fact sheet summarizing it, visit http://www.who.int/peh-emf/publications/elf_ehc/en/index.html <http://www.who.int/mediacentre/factsheets/fs322/en/index.html>

Magnetic Fields at Home (Measurements are in milligauss.)			
	1.2" away	12" away	39" away
 Microwave Oven	750 to 2,000	40 to 80	3 to 8
 Clothes Washer	8 to 400	2 to 30	0.1 to 2
 Electric Range	60 to 2,000	4 to 40	0.1 to 1
 Fluorescent Lamp	400 to 4,000	5 to 20	0.1 to 3
 Hair Dryer	60 to 20,000	1 to 70	0.1 to 3
 Television	25 to 500	0.4 to 20	0.1 to 2

Source: Adapted from Gauger 1985.

Magnetic Fields Outside (Maximum values may be lower for some California utilities.)	
 Distribution Lines	1 to 80 milligauss under the line
 Transmission Lines	1 to 300 milligauss edge of right-of-way

What You Can Do

In a situation of scientific uncertainty and public concern, WHO recommended that utilities explore “very low-cost” ways to reduce EMF exposure from new or upgraded facilities. SCE and other California public utilities already pursue no-cost and low-cost measures to reduce EMF levels from new utility transmission lines and substation projects. You, too, may want to take no-cost and low-cost measures to reduce your EMF exposure at home and at work.

Human studies have not produced a consensus about any health benefits from changing the way people use electric appliances. But, if you feel reducing your EMF exposure would be beneficial, you can increase your distance from electric appliances and/or limit the amount of time you use appliances at home or at work.

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Reviewed by: California Public Utilities Commission (CPUC)

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Campos Eléctricos y Magnéticos (EMF):

Si desea recibir información en español, comuníquese con SCE al 1-800-441-2233.

(continued from front page) You can locate the sources of EMF in your work environment, and spend break time in lower-field areas.

It is not known whether such actions will have any impact on your health.

Additional Information Is Available

SCE provides free EMF information packages and home/business measurements upon request. We also invite you to attend a workshop on EMF at our EMF Education Center located in Irwindale. For any of these services, please call us at **1-800-200-4SCE**.

Additional information is also available from these sources:

World Health Organization International EMF Project:
<http://www.who.int/peh-emf/en/>

National Institute of Environmental Health Sciences:
<http://www.niehs.nih.gov/health/topics/agents/emf/>

California Department of Health Services: <http://www.ehib.org/emf/>

California Public Utilities Commission:
<http://www.cpuc.ca.gov/PUC/energy/Environment/ElectroMagnetic+Fields/action.htm>

The Jet Propulsion Laboratory Pioneers Energy Management

For Pasadena's legendary Jet Propulsion Laboratory (JPL), which builds and operates unmanned spacecraft for the National Aeronautics and Space Administration, also known as NASA, the sense that "anything is possible" works as well on the ground as it does in space. JPL's energy managers are proving that even with extraordinary energy applications, and constantly changing program needs, they can achieve dramatic energy savings right now in day-to-day operations.

To their roster of historic achievements — Explorer, Mariner, Pioneer, Magellan, Mars Odyssey — JPL has now added the title of Best Overall Winner in California's annual Flex Your Power Awards, accomplished with JPL's launch of energy management programs and incentives from SCE.

JPL finds that achieving seemingly impossible energy savings starts with educating and informing people. Posters, presentations, emails, a call center and weekly television updates spread the word, explain the goals, and share the results JPL achieves with SCE. Recognition like the Flex Your Power award is everyone's success.

SCE offers a range of programs such as cash incentives, energy surveys, and payment options to help you better manage your electricity costs. To learn more, please contact your SCE account representative, visit us at www.sce.com/bizsave, or call **1-800-990-7788**.

Edison Challenge: Team Registration Opens October 8

Edison International, SCE's parent company, and the University of Southern California Wrigley Institute for Environmental Studies have partnered again to present the Edison Challenge — an environmental science competition designed to help students in grades 6-12 become better environmental stewards.

Now entering its fourth year, the Edison Challenge is open to teams that consist of a teacher and sixth through twelfth-grade students in SCE's service territory. The teams create projects that focus on energy and the environment and involve research, planning, and community service. The Edison Challenge also offers workshops for teachers to provide them with lessons they can take back to the classroom.

Teachers from finalist teams will receive educational awards including cash prizes for classroom supplies or professional development. First-place teams win a week on Catalina Island. Registration for the Edison Challenge begins on October 8, 2009 and closes October 29, 2009. For complete details about the program, visit www.sce.com/challenge.

September is National Preparedness Month SCE Reminds Customers to Be Prepared

September has been designated as National Preparedness Month. A natural disaster can strike at any moment and could cause an occasional power outage. SCE responds to restore power when outages occur, safely working around the clock to minimize the length of outages while keeping customers informed. We encourage you to be prepared by following the safety tips below to help you and your family stay safe in the event of a power outage:

- Keep a flashlight and extra batteries in an accessible area. Never use candles in a power outage or other emergency.
- Walk throughout your home with a flashlight to make sure there is no power in any part of the home. If only one room is without power, it may be a blown fuse or a tripped circuit. If all power is out for more than a few minutes, call SCE at **1-800-611-1911** to report the outage.
- Always turn off or unplug any appliances or lights that were on before the outage occurred. Leave one light in the "on" position so you'll know when power has been restored.
- Never use a barbeque indoors for cooking or heating. To keep warm, put on layers of clothing instead.
- Limit the amount of times you open your refrigerator and freezer doors. This will help to keep food cold and fresh longer.
- If you see a downed power line, stay at least 10 feet away and keep others away from it as well. Never approach a wire even if it appears to be de-energized. **Call SCE immediately at 1-800-611-1911 to report the downed line.**

For more safety tips, visit www.sce.com/prepare.

Investing in Reliability: SCE Welcomes Its Newest Substation in Rancho Cucamonga



SCE is committed to providing you and all our customers with reliable electric service, now and in the long term. We are working hard to ensure that new power sources are available to meet the region's growing electricity needs.

One recent example of the major investments SCE is making to provide a reliable and robust transmission and power delivery system is the new Rancho Vista substation in Rancho Cucamonga. While official grand opening ceremonies took place in August, the substation has been operational since June, serving 270,000 customers in San Bernardino County.

Rancho Vista is the first SCE substation to house photovoltaic panels on the roof of the structure (generating 250 kilowatts of power). It eases constraints on power supplies in California's Inland Empire region, where the demand for energy has grown. The Rancho Vista substation helps the Mira Loma substation five miles to the south manage increased demand in the eastern region of SCE's service territory.

To keep pace with growth in demand and ensure future service reliability, SCE has begun a major infrastructure expansion and replacement project. The company has proposed investing \$20 billion over the next five years to expand and renew the region's essential distribution and transmission grids, making the power grid greener and smarter for nearly 14 million Californians.

To learn more about SCE's commitment to reliability, visit www.sce.com/smartergrid.