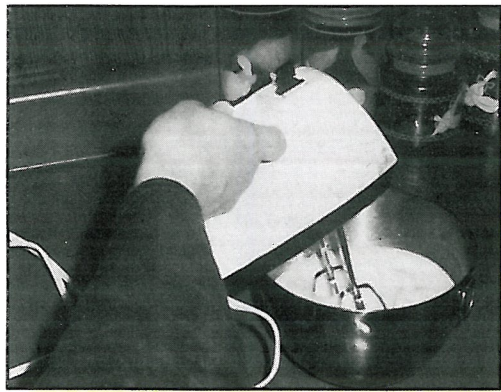


Power lines, electrical wiring and appliances produce low-frequency, low-energy electric and magnetic fields (EMF). EMF are invisible lines of force that exist in the area surrounding a power line or any electrical device. These fields have been the subject of much research focusing on potential long-term health effects.

Q. What are electric fields?

A. Voltage, which causes electrical current to flow through a conductor, also causes electric fields in the air around the conductor. (A conductor is a wire which carries electricity.) Electric field strength can vary in intensity - from 3 kilovolts per meter in the immediate area of a transmission line (which carries electricity long distances at high voltages) to under 10 volts per meter for home appliances. Electric field levels inside



most houses are not affected much by power lines because trees, shrubs and building materials greatly reduce the strength of electric fields (as does distance from the line).

Q. What are magnetic fields?

A. Magnetic fields are only created when a current passes through a conductor. The amount of current in a transmission line

varies in proportion to the changing power requirements throughout the day of homes and businesses. Therefore, the magnetic field strength also varies. Magnetic fields not only are created by transmission lines but by home appliances and wiring when they are in use. Like electric fields, magnetic field strength decreases rapidly as the distance from the source increases. Unlike electric fields, however, power line magnetic fields can contribute to the fields found inside homes since magnetic fields are not weakened by trees or building materials.

Q. How are EMF measured?

A. Electric fields are measured with a meter placed on the end of a long insulated handle (a distorted reading could be caused by a shielding effect of the surveyor's body). Magnetic fields are usually measured by a hand-held device called a gauss meter (magnetic fields are measured in units of Gauss). In-home magnetic field measurements can be especially difficult to interpret because there are multiple sources of magnetic fields within and surrounding the home and each source can vary greatly over time and with distance from the source. The magnetic field in homes can even depend partly on how much electricity is being used in a neighboring home.

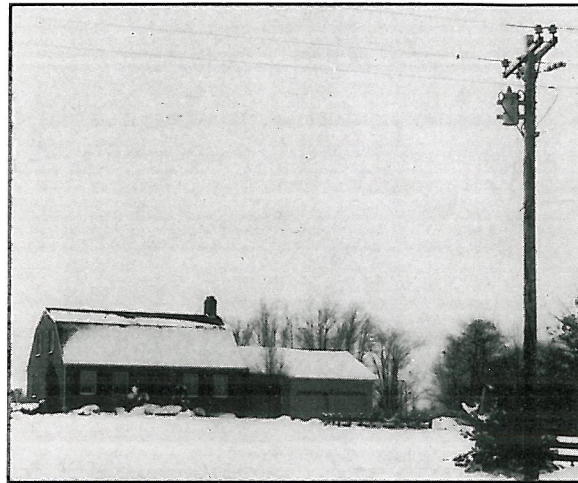
Q. Are there regulations for EMF?

A. There are no national standards or regulations specifically for power line EMF. The National Electrical Safety Code (NESC) specifies the distance needed between power line conductors and the nearest house or building to prevent inadvertent contact. Even though the NESC requirements were developed as construction rather than safety standards, the NESC limitations indirectly result in upper limits on EMF for transmission lines, distribution and other energized facilities.

Q. Can you feel EMF?

A. Currents produced by electric fields from household wiring or by power lines are too weak to

be felt. However, some people can detect the electric field in the immediate area physically surrounding transmission lines through the vibration of hair on the head or arms. These induced currents, however, are weaker than the electrical currents which occur naturally in your body - such as the electrical activity of the brain and heart. Magnetic fields can not be sensed without special instruments.



Q. Have laboratory studies shown any effects of EMF?

A. The results of research done on laboratory animals have provided no consistent evidence on effects of EMF. However, researchers have found changes in behavior and activity, biological rhythms, certain hormone levels, bone fracture healing, response to drugs and learning abilities. Overall, these effects have been very small and disappear when the field is removed.

Q. Does exposure to EMF increase the risk of developing cancer?

A. Americans are exposed to a large number of known and suspected cancer-causing or promoting agents. Almost three-quarters of all cancers in the U.S. are thought to be attributable to diet, smoking,

occupation, natural radiation and alcohol. Because most of these factors involve voluntary actions, many cancers are preventable. Our culture includes many factors which contribute to increased risk of cancer; scientists have not concluded that EMF are among them.

Q. Should anything be done to limit exposure to EMF?

A. Some studies have suggested the possibility for adverse effects of EMF, and some groups have recommended precautionary measures for limiting EMF exposures. A recent U.S. Environmental Protection Agency report on indoor air pollution also addressed EMF, and acknowledged that EMF have not been proven to be a health hazard, but suggested caution before increasing EMF exposures to the public.

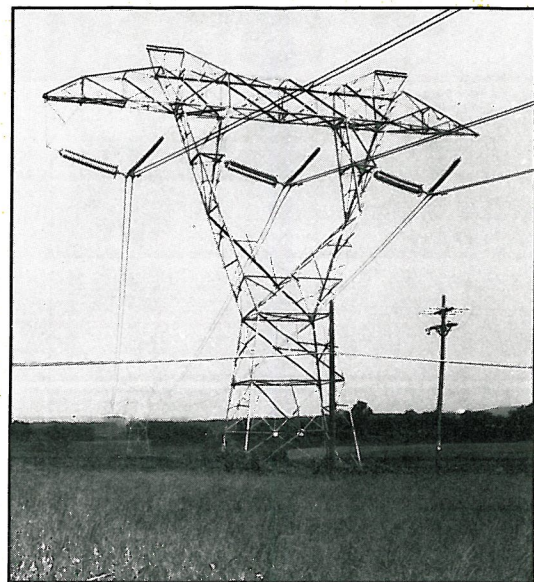
THE EMF CONTROVERSY

EMF have recently come under close scrutiny by electric utilities, public and private health agencies and the general public. This recent focus stems partly from some studies which indicate a possible association between EMF and adverse health effects.

Voltage, the electrical force that causes current to flow in a conductor, produces an electric field whether or not the current is flowing. A plugged-in lamp cord, for example, creates an electric field whether the lamp is on or off. A magnetic field is created only when the lamp is turned on and the current is flowing to make it work.

Unfortunately, it is much easier to define EMF than it is to pinpoint its effects — if any — on human health, livestock or crops.

Studies concerning electric fields have been conducted since the 1970s and researchers have generally concluded that electric fields present no adverse health risks. However, the results of research involving



possible health effects of magnetic fields remain inconclusive.

In 1979, researchers Dr. Nancy Worthheimer and Mr. Ed Leeper reported an apparent association between childhood leukemia and the size and number of wires on power poles in a Denver neighborhood.

Worthheimer and Leeper assumed bigger wires produced higher magnetic field levels in nearby homes, but they did not measure the strength of fields.

Nearly a decade later, in 1988, Dr. David Savitz recreated the Denver study. Savitz, however, actually measured the strength of the electric and magnetic fields in some of the homes. Savitz also reported a slightly higher-than-normal rate of cancer among children living near power lines, but did not find an association between cancer and measured EMF levels.

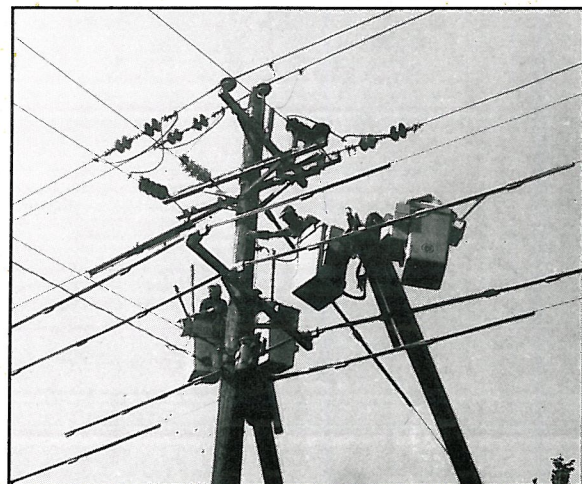
Other research has focused on workers in electrical occupations. In 1985, Savitz and Dr. Eugenia Calle looked at health study records for ten different categories of electrical workers in Wisconsin. They reported higher-than-normal rates of leukemia among two categories, radio and telegraph operators and electrical engineers. But they did not find higher rates in

other job categories such as power line workers and power plant operators.

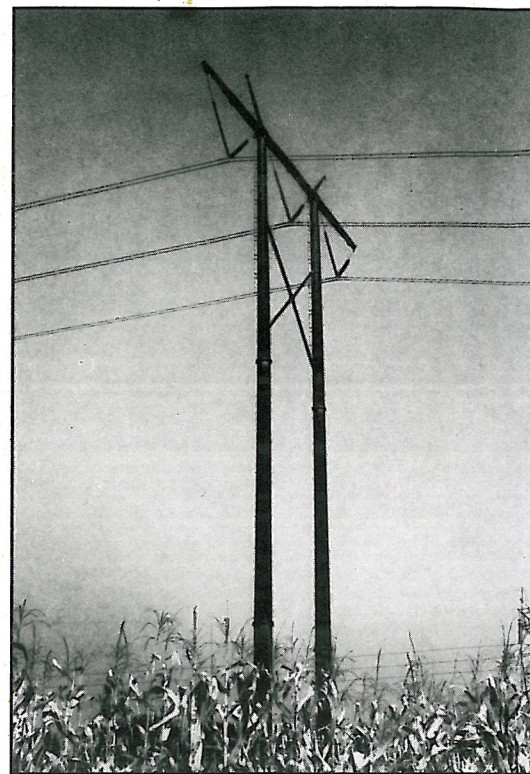
Much of the controversy surrounding EMF centers on conflicting or inconclusive results from studies such as these. That's why nearly everyone agrees more research is needed.

Currently, independent laboratories and major universities around the world are conducting numerous EMF studies. The Electric Power Research Institute (EPRI) is conducting a study of childhood cancer and power lines in Los Angeles, and power line epidemiological studies are also being conducted in Sweden and Great Britain. EPRI has also begun studies of cancer among electrical workers. It is hoped that these controlled laboratory experiments will provide conclusive answers regarding the health effects of EMF, if any.

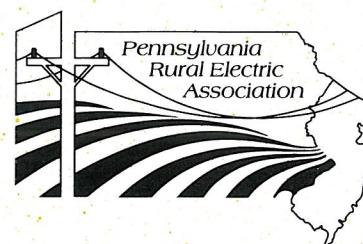
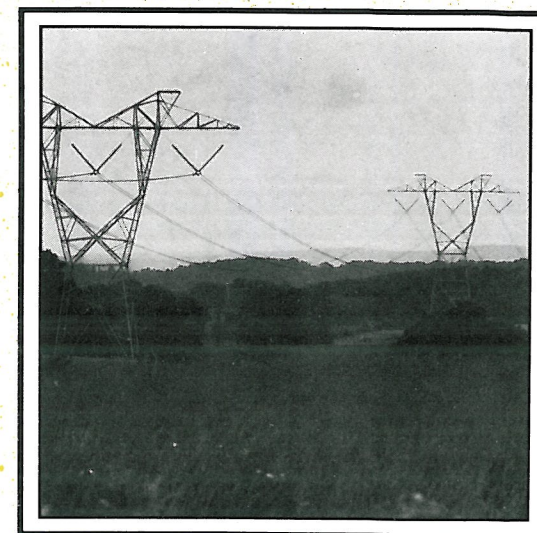
Over 600,000 consumer-members depend on Allegheny Electric Cooperative and its 14 member distribution cooperatives in Pennsylvania and New Jersey for reliable, affordable electricity. But before that energy can power homes and businesses, it must be generated and distributed to them over transmission and distribution lines.



As cooperative organizations, owned by those they serve, Allegheny and its members cooperatives are directly concerned with the well-being of their consumers. So, in fulfilling the obligation to provide electricity, EMF becomes an important issue.



ELECTRIC AND MAGNETIC FIELDS



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