



Understanding Electric & Magnetic Fields

An electromagnetic field, sometimes referred to as EMF, is created by electrical charges. Electric charge creates electric fields. Moving charges create both electric fields and magnetic fields. There is an electric field when an appliance is plugged into the wall. When the appliance is turned on, current or charge flows creating both a magnetic field and an electric field. The term electromagnetic field refers to an electric field, or the magnetic field or both fields. Given the widespread use of electricity, electromagnetic fields or EMFs are present everywhere in our daily lives.

Safety practices and EMF exposure

Extensive [research](#) on EMF exposure and safety has been conducted by international and national scientists. The results from this research have been evaluated by reputable international and national scientific and public health organizations and agencies. The company relies on the evaluations from these organizations and agencies when assessing potential risks. All of our proposed transmission facilities follow the rules, [regulations and standards](#) for electromagnetic field exposure to provide safe and reliable electric service.

Electric and magnetic field (EMF) exposure

EMFs occur anywhere there is electric power. Most electromagnetic fields found in homes are power frequency (60-hertz), which is categorized as extremely low frequency (ELF). Common sources of electric and magnetic fields in the home are appliances, televisions, computers, and standard electrical wiring. Anything that has a voltage has an ELF electric field. When a device is turned on, electrical current flows, which also creates an ELF magnetic field.

The *electric* fields near outdoor transmission lines are typically stronger than those found in homes because they have a higher voltage than residential sources or appliances/devices. On the other hand, the magnetic fields around electrical appliances in homes can be as high as or higher than the magnetic fields near outdoor power lines. Because electromagnetic fields decrease significantly with distance from the source, EMF exposure from power lines is reduced significantly by the distance from the wires – including the height of the towers or poles that carry overhead transmission and distribution lines. Transmission line electric fields, but not magnetic fields, are also shielded by trees and homes, so that they are further reduced inside homes and buildings.

The chart below illustrates how the magnetic field exposure lessens with an increase in distance from typical electric sources at home.

At home

Measurements are in milligauss

	1.2" away	12" away	36" 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
Compact fluorescent bulb	0 to 32.8	0 to 0.1	0
Hair dryer	60 to 20,000	1 to 70	0.1 to 3
LCD/plasma TV	1.1 to 73.6	0 to 2.5	0 to 2.2

Source: Adapted from Gauger 1985 & EPRI Appliance Measurements Study 2010

This chart describes the typical values of magnetic fields around distribution and transmission lines.

Outside

Maximum values may be lower for some utilities

Distribution lines	1 to 80 milligauss under the line
Transmission lines	1 to 300 milligauss edge of right of way

More information

Read more about [what you can do](#) within your home to reduce your exposure.

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