

Electromagnetic fields (EMF) and possible health effects

Sources of Electromagnetic Fields

Many people are concerned about the alleged link between exposure to magnetic fields and an increased risk of contracting cancer. These concerns are raised when stories appear in the media in which the words *radiation* and *cancer* are emphasized, particularly when children are also involved. There is a general perception amongst many in the community that there are health risks resulting from exposure to electromagnetic fields (EMF; e.g. from power lines).

All alternating electric currents (i.e. AC currents for normal power) generate *electric* and *magnetic* fields, collectively known as EMFs. These fields emanate from the wires delivering electricity to all devices which use electricity in the home and workplace.

- The *electric* field is proportional to the voltage.
- The *magnetic* field is proportional to the current, i.e. the amount of electricity flowing through the wires. The direction of the current changes 50 times per second (that is, at 50 Hz).

Health Effects

Human studies to date have shown no evidence that prolonged exposure to weak electric fields (such as those found in the home or in most workplaces), results in adverse health effects. It is for these reasons that the majority of scientists and Australian Radiation Health authorities in particular, do not regard chronic exposure to 50 Hz electric and magnetic fields at the levels commonly found in the environment as a proven health risk.

Some authorities advocate a policy of minimising exposure wherever possible. Since this is essentially a question of judgment, such decisions are best left to the individual e.g. a distance of about 50 cm between a computer/laptop screen and the user usually results in an exposure not very different from those found elsewhere in the environment.

Workplace Exposures

The widespread use of electricity means that in all workplaces, there will be levels of magnetic fields that would be considered 'normal'. There are also localised sources of magnetic fields in the workplace such as electrical substations in the basement, power cables in the walls or floor and distribution lines close to the building. The field levels close to these sources will be relatively high and may cause computer screens to shimmer, for example. These levels may exceed the National Health and Medical Research Council (NHMRC) limit. Fortunately, the magnitudes of both electric and magnetic fields decrease rapidly with increasing distance from the source. The easiest way to reduce the exposure to these fields is to simply move people away from electrical appliances and facilities by rearranging room layouts.

On occasion, the department has engaged Queensland Health Scientific Services to examine EMF levels from above ground distribution lines, computer server areas, fuse boards, fluorescent lighting and electrical circuits at various sites. Results showed that all measurements were below the National Health and Medical Research Council's *Interim guidelines on the limits of exposure to 50/60Hz electric and magnetic fields (1989)*.

Further Information:

[Australian Radiation Protection and Nuclear Safety Agency \(ARPANSA\) Understanding radiation](#)