



## **Eskom Information Brochure: Electric and Magnetic Fields (EMF's)**

### **1. SUMMARY**

There is an ever increasing misconception, by the general public, with regard to health risks associated with Electric and Magnetic Fields (EMF's) and Electric Transmission power lines.

Research into the biological effects of EMF has been accompanied by considerate public concern over the last decade or more. Lay understanding of the topic has, unfortunately, also been clouded by media coverage with a sensational tone to it.

Electric and Magnetic Fields are associated with all electrical equipment and not just power lines.

The EMF's to which people are exposed in the home and office environments are well within the International Radiation Association (IRPA) recommended guidelines.

### **FACT SHEET: ELECTRIC AND MAGNETIC FIELDS – CAN THEY AFFECT YOU?**

Electricity is essential in our modern society; we use it in our homes, at leisure and in our work places. Without it we would be unable to function as we do and it would be difficult to envisage industrial development. Therefore any suspicion that fields associated with electric power may be harmful to humans must be addressed in a responsible manner.

There have been several debates about human exposure to these fields and their possible biological effects. In many instances this has become an emotional issue widely discussed by the media. Because of the lack of sufficient knowledge on the subject, such reports have had the effect of blowing the subject out of proportion.

**QUESTION:**

What is an Electric Field?

**ANSWER:**

The electric field is the invisible “force” generated by the voltage on a conductor. Close to the conductor this field is at its maximum and decreases the further one moves away from the conductor.

The electric field rises and falls, fifty times per second, as the voltage rises and falls on the conductor. The frequency with which the voltage rises and falls is measured in hertz. In this case 50 hertz, the frequency at which Eskom generates electricity. The unit used to indicate the value of the field is kilovolt per metre (kV/m).

**QUESTION:**

What is the value of the electric field near Eskom’s power lines?

**ANSWER:**

A typical maximum value of the electric field at the servitude boundary of the highest voltage transmission line in South Africa, namely 765 000 volt, is about 3kV/m. This level is lower than the maximum limit of 5kV/m suggested for continuous general public exposure by the International Radiation Protection Association (IRPA), which forms part of the World Health Organisation.

It is interesting to note also that the intensity of the electric field is reduced markedly by objects such as vegetation and buildings.

Extensive research has found no detrimental effects on health from electric fields.

**QUESTION:**

What is a Magnetic Field?

**ANSWER:**

The Magnetic Field is also an invisible force, generated by the current flowing in the conductors. The intensity of the magnetic field also drops rapidly the further one moves away from the conductor..

**QUESTION:**

What is the unit of measurement for the magnetic field?

**ANSWER:**

The unit of measurement for the magnetic field generated by power lines is the microtesla ( $\mu\text{T}$ ). A typical maximum value for the magnetic field intensity, at man's height underneath a 765 000 volt transmission line carrying 1 000 ampere, is about  $3\mu\text{T}$  as measured at the end of a servitude. The suggested IRPA limit for continuous general public exposure is  $100\mu\text{T}$ .

**QUESTION:**

Can the magnetic field around conductors have a negative effect on people and animals?

**ANSWER:**

After nearly two decades of scientific research on power frequency fields and their possible biological effects, scientists have not been able to decide whether or not exposure to magnetic fields is harmful to human or animal health.

**QUESTION:**

Has research on the subject been shelved?

**ANSWER:**

No. Research is increasing in many laboratories around the world in an attempt to finally answer all the questions.

Reviews of past research have been carried out by various health and regulatory bodies, including the World Health Organisation (WHO), Cigre (International Conference on High Voltage Systems) and the Electric Power Research Institute (EPRI) in the United States.

Various national bodies such as the National Grid Company in England, and various universities and research groups world-wide are also involved in ongoing research.

They have all been trying to reach a conclusion on whether adverse health effects exist or not.

**QUESTION:**

Has Eskom carried out any research on the subject?

**ANSWER:**

Eskom, as South Africa's national electricity supply utility and as a responsible organization is involved in local research on the issue. The main drive is to measure the electromagnetic environment around our lines and substations to determine the levels of public and employee exposure.

Eskom supports university research in South Africa, and continuously encourages the creation of a countrywide electric and magnetic field forum.

Eskom is continuously monitoring research and literature on the subject to stay abreast of developments.

For more information: dial 011 629 5212/6295107 during office hours.