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# Modelling induced fields in the human body exposed to electric fields from high voltage transmission lines designed to meet 10 kV/m at ground level

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## ABSTRACT

There has been increasing public concern regarding adverse health effects due to power frequency electric and magnetic fields. Safety guidelines/standards for electric and magnetic field exposures have been established by different public organizations. However, the link between low frequency (power frequency) electric and magnetic field exposure and adverse health effects is not yet well established. Limits on human exposure to low frequency electric and magnetic fields are fundamentally specified for *in-situ* fields in tissues/organs. These dosimetric limits are referred to as *Basic Restrictions* for protection against potentially adverse effects from electro-stimulation. In addition, secondary limits, the exposure *Reference Levels* in environmental electric and magnetic fields are also given for practical compliance purposes. These are generally derived from the Basic Restrictions based on uniform-fields with a provision that the Basic Restrictions must be observed for non-uniform cases. In practice, any structure influences the electric fields in High Voltage systems, and thus creates electric field non-uniformity. The human exposure of the general public to electric fields from Eskom's 765 kV transmission network operating at 50 Hz, is addressed through physical measurements, theoretical predictions and 3-D human model dosimetry, which is presented in this dissertation.