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Exposition résidentielle aux champs magnétiques produits par les lignes de transport et de répartition (Residential exposure to magnetic fields produced by transmission and distribution lines).

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Abstract

In June 1986, Hydro-Québec adopted a corporate action plan on the biological effects of electric and magnetic fields. The plan includes eleven research and communication projects. One of the research projects involves the use of measurements and calculations to characterize the electric and magnetic fields in various environments.

The objective of the study described in this report was to document the impact of exposure to magnetic fields from transmission and distribution lines on people living in the vicinity. The study also assessed the contribution of transmission and distribution lines to the magnetic field in residential environments and developed a general statistical model for calculating magnetic-field exposure for people residing near Hydro-Québec's transmission and distribution lines.

First, various parameters of magnetic-field exposure were measured in more than ninety homes. These residences were separated into six groups: three of these groups were linked to three transmission and distribution lines (735 kV, 315 kV and 120 kV) . The results were then compiled in tables and histograms. Statistical tests (multiple comparison, correlation and linear regression tests) were performed with these results to characterize the influence of the transmission lines on residential exposure to magnetic fields.

Also, a statistical model using a Monte Carlo simulation was developed to calculate the theoretical distribution function of the magnetic field in a home located near a transmission or distribution line. This model was tested by comparing the measurements recorded during this study with the results from the model.