Canada

Report on EMF Activities
9th International Advisory Committee Meeting on EMF
June 2004

1. Research activities

Health Canada

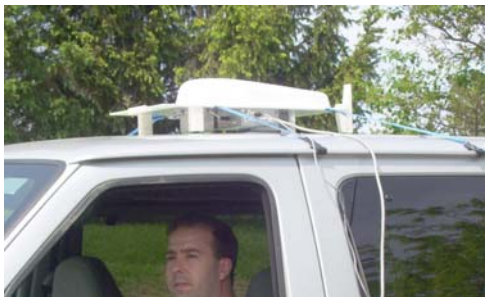
- Health Canada has carried out its in-house studies to assess the biological effects of power-frequency (60 Hz) fields and radiofrequency (RF) fields at 1.9 GHz (North American PCS frequency). Recent activities include:

  - Assessment of the effect of acute power-frequency magnetic fields on the formation of primary DNA damage in the immature mouse, adult mouse and adult rat brain. The animals will be exposed to 0, 0.1, 1.0 and 2.0 mT for 2 h, then sacrificed 0, 2, or 4 h later. Using the alkaline comet assay to assess for DNA damage in whole brain and cerebellum homogenates. This work will act as a pseudo-replication study of that of Lai and Singh et al. (1995, 1996) and Svedenstal et al. (1998). Experiments are nearly completed. Results will be compiled over the summer and a manuscript submitted for publication this fall.

  - Experiments have been conducted to assess for gene expression changes in human cells *in vitro*. A poster on "Microarray gene expression profiling of a human glioblastoma cell line exposed *in vitro* to 1.9 GHz pulse-modulated radiofrequency fields" will be presented at the Bioelectromagnetics Society 26th Annual Meeting, Washington DC, June 20-24, 2004**.**

  - A set of three studies on the effect of 1.9 GHz (continuous wave and TDMA-like) RF fields (0, 0.1, 0.3, 1.0, 3.0 and 10 W/kg) on DNA damage in human blood cell cultures was conducted. There were no effects. Results have been published in refereed journals.

  - Measurements of ground level emissions near mobile phone base stations in the Regional Municipality of Ottawa, using a low-cost measurement system developed at Health Canada (see photos on the next page), have been conducted. The measurement system and power density maps of the areas surveyed have been presented at a number of scientific meetings and in a technical report, which is available on the Health Canada website (www.hc-sc.gc.ca/hecs-sesc/ccrpb/electro.htm). Similar RF emission surveys are being carried out in the Regional Municipality of Vancouver using this measurement system.



A low-cost, fully integrated and portable system for mapping RF fields or power density around mobile phone base stations (developed by Health Canada's scientists).

For more information, contact Dr. Art Thansandote at <art_thansandote@hc-sc.gc.ca>.

Hydro Quebec

- Hydro Quebec is involved in two EMF studies looking at:

  - Psycho-physiological effects of electric fields to determine whether there is a subgroup of population that is more sensitive to electric shock; this could change the standard for setting the right of way width. This study is completed and the final draft of the report is under preparation.

  - Neurophysiological effects of magnetic fields at 100 μT to 900 μT (workplace exposure) to specify physiological thresholds linked to exposure limits. Experiments with workers are finished and the analysis of all the data is underway.

  The two research teams are preparing publications to be submitted by the end of this summer. For more information, contact Dr. Daniel Goulet at <Goulet.Daniel@hydro.qc.ca>.

University of Western Ontario

- The Lawson Health Research Institute and the University of Western Ontario are conducting laboratory studies to seek ways to minimize the potentially harmful effects of MRI or other magnetic field exposures and maximize any possible beneficial effects of specific pulsed ELF magnetic fields, including Image-Guided Magnetic Field Therapy. Recently presented at the joint American and Canadian Pain Society (May 2004), randomized double-blinded placebo-controlled trials of a weak specific pulsed magnetic field therapy have shown a significant pain reduction in fibromyalgia and arthritis patients. These studies are funded by the Canadian Institutes of Health Research ($690,000 Can) and Ontario Research and Development Challenge Fund ($1.4M). For more information, contact Dr. Frank Prato at<prato@lri.sjhc.london.on.ca> or Dr. Alex Thomas <athomas@lri.sjhc.london.on.ca>. Other research includes the evaluation of the effects of static magnetic fields on cell free systems (Dr Jeff Carson <jcarson@lri.sjhc.london.on.ca>).

University of Ottawa

- University of Ottawa is collaborating with the International Agency for Research on Cancer (IARC) on the large-scale epidemiological study on mobile phones. For more information, contact Dr. Daniel Krewski at <dkrewski@uottawa.ca>.

2. Standard

The following standard document, published by Industry Canada in 1999, is currently under revision. There is no specific timeframe when the revision will be completed.

- Radio Standards Specification 102 – *Evaluation Procedure for Mobile and Portable Radio Transmitters With Respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields*.

3. Public Concerns

- Mobile phone base stations continue to be an issue of frequent public concerns. More base stations have recently been installed in response to the increasing demand for mobile phone services. Various factors contribute to these concerns including media reports about scientific studies linking electromagnetic energy from mobile handsets (not base stations) to cancer. Though still controversial in the scientific community, these findings are often interpreted as being applicable to exposures from base station emissions as well. It is often argued that although base station exposures are at very low levels compared to that from a handset, they are continuous, exposing people for twenty-four hours per day. In addition to the scientific reports, these concerns are also fuelled by the basic assumption by the public that as cellular demand increases, so does the emission levels from base stations.

- While mobile telephones are still an issue of concern, the number of inquiries made to Health Canada is decreasing.

- Power lines and ELF fields. The number of inquiries is higher in the spring when more people consider purchasing new homes/properties, many of which are near high voltage transmission lines and/or transformer boxes. Besides worrying about the safety of EMF exposures, a number of home owners are also concerned about property devaluation. A recent plan by a major electrical utility (Hydro One Networks) to raise the line voltage of a high voltage transmission line in Toronto from 115 kV to 230 kV has caused increasing concerns by residents living near the corridor edge. In order to deal with this issue, the utility is assembling a panel of experts to provide information and answer questions at a public meeting. Health Canada was requested to participate in this event. Concerned citizens will invite their own experts to join the panel.

- Computer jittering. This electromagnetic interference problem is often perceived by workers as a health concern. The response from Health Canada’s scientists is that computer monitors are sensitive electronic devices. When placed in an area where magnetic fields are slightly above the background level, there will be image distortion or jitter on the monitor. However, magnetic fields that can cause the screen image to jitter or distort are well below the levels of any health concerns. This information has been included in Health Canada’s updated information documents on “Safety of Exposure to Electric and Magnetic Fields from Computer Monitors and Other Video Display Terminals” and “Electric and Magnetic Fields at Extremely Low Frequencies.”

- Microwave ovens. Recent concerns include the rusting of interior cavities that can cause holes and radiation leakage. Health Canada’s scientists have recently looked into these concerns and have concluded that holes less than about 2-cm diameter do not cause radiation leakage to exceed the Canadian regulatory limits.

4. **Public Information Activities**

- New Health Canada publication: “It’s Your Health (IYH)” document on “Whole Body Screening using MRI or CT Technology.” Available from Health Canada’s website at the address: www.hc-sc.gc.ca/english/iyh/medical/mri.html.

- Health Canada is finalizing a public information document “It’s Your Health (IYH)” on “Microwave ovens and food safety.” It will be posted on Health Canada’s website (www.hc-sc.gc.ca/english/iyh/products) this summer.

- Health Canada is finalizing a document titled “Cancer and the Environment: Ten Topics in Environmental Cancer Epidemiology in Canada.” A chapter on “Electric and magnetic fields at power frequencies” is included. The document should be ready for publication soon.

- The following Health Canada publications have recently been updated:

  - IYH document on “Safety of Exposure to Electric and Magnetic Fields from Computer Monitors and Other Video Display Terminals.” Available from Health Canada’s website at the address: www.hc-sc.gc.ca/english/iyh/products/vdt.html
  - IYH document on “Electric and Magnetic Fields at Extremely Low Frequencies.” Available from Health Canada’s website at the address: www.hc-sc.gc.ca/english/iyh/environment/magnetic.html

- In March 2003, Industry Canada announced the appointment of the National Antenna Tower Review Committee, consisting of municipal officials, as well as industry, health and academic experts <http://strategis.ic.gc.ca/SSG/sf07012e.html>. The committee will consult with citizens, communities and companies on improvements in the policy and siting procedures for antenna tower placement. The results of the public consultation and the Committee's recommendations should be submitted to the Minister of Industry this summer.

Prepared by Art Thansandote
June 15, 2004.