

GUEST EDITORIAL

World Environmental Day was commemorated on June 5, 2009. This day represents a commendable attempt by the United Nations to encourage worldwide awareness of the environment and the need to protect and preserve it. According to the United Nations Environment Programme, "the day's agenda is to give a human face to environmental issues; empower people to become active agents of sustainable and equitable development; promote an understanding that communities are pivotal to changing attitudes towards environmental issues; advocate partnership which will ensure all nations and people enjoy a safer and more prosperous future." The engineering fraternity needs to be keenly aware of these issues and be prepared to make its contribution towards ensuring a safe environment for all citizens.

Regionally, two issues with potential negative environmental impact that have caused considerable disquiet, particularly in Trinidad and Tobago, are aluminium smelters and cell tower radiation. Trinidad and Tobago is in the process of introducing aluminium smelters as part of a long-term strategy of industrial development. However there is a significant anti-smelter lobby which claims that the emissions from modern smelter plants are harmful to human health. In fact, the President of the Trinidad and Tobago Medical Board has written in the local press on this issue and has drawn attention to some of the evidence in support of this claim. Also, on June 16, 2009, the Port of Spain High Court quashed the decision of the Environmental Management Authority to issue a Certificate of Environmental Clearance for the building of a multi-million dollar aluminium smelter at La Brea. In doing so, the court noted that the decision of the EMA "was procedurally irregular, irrational and made without regard to the cumulative impact of the three related projects the power plant, the aluminium complex and the port facility." [The Daily Express, 17/6/2009]. I am not at this time able to offer an informed view on the subject though my preliminary investigation suggests that there may be ill-health effects involved.

On the issue of cell tower radiation, the erection of cell towers across Trinidad and Tobago has created considerable concern among citizens in this country. The public generally believes that the electromagnetic radiation emitted by these towers may be harmful and as a result, many have successfully agitated for the removal of cell towers from their communities while others have acted to prevent them from being introduced. Citizens in communities across the world have raised similar concerns about the possible harmful effects of cell tower radiation. In response to this many mobile phone companies, several international organizations such as the International Commission for Non-Ionizing Radiation Protection (ICNIRP) and the World Health Organization and other government bodies, such as the UK Expert Committee chaired by Sir William Stewart claim that there is no scientific evidence that exposure to radiation below ICNIRP guidelines is harmful.

Because of the possible health threat presented by the radiation from these towers, I have examined some of the vast literature on radiation and its effects on health. I have found, based primarily on peer-reviewed publications, that there is a large and growing body of credible scientific evidence that cell tower radiation is harmful to health and that the effects are very similar to effects observed in biological and epidemiological studies conducted over the past 50 years. These effects include cancer, particularly brain tumour and leukemia, cardiovascular problems including altered blood pressure, neurological effects including altered brain activity, sleep disturbance, learning difficulties, depression and headaches, viral and infectious diseases arising from reduced melatonin, DNA strand breakage leading to cell death and chromosome aberrations.

Several international groups and organizations have expressed concern over the effects of the radiation. These include the following:

- **Vienna Resolution, October 1998:** The evidence persuaded an international team of 16 scientists to sign the Vienna Resolution in which the participants agreed that biological effects from low-intensity exposures to radio frequency fields are scientifically established.
- **Salzburg Resolution, June 2000:** Nineteen scientists and medical workers from 10 countries signed the Salzburg Resolution, which recommended an outdoor exposure level of less than $0.1\mu\text{W}/\text{cm}^2$, a value that is over 4000 times lower than the ICNIRP level at 900MHz.
- **Catania Resolution, September 2002:** Sixteen prominent scientists in the field of electromagnetic radiation signed the Catania Resolution stating that emission levels below ICNIRP guidelines can give rise to ill-health consequences.
- **Freiburger Appeal, October 2002:** The ill-health effects convinced over 3000 medical professionals and many other individuals across the world to sign the Freiburger Appeal in which radiation from telecommunications systems is identified as having a deleterious effect on health and calls upon governments to take action.
- **Benevento Resolution, September 2006:** The International Commission for Electromagnetic Safety issued the Benevento Resolution which endorsed and extended the 2002 Catania Resolution. It says "More evidence has accumulated suggesting that there are adverse health effects from occupational and public exposures to electric, magnetic and electromagnetic fields at current exposure levels." Signed by 31 leading scientists from around the world, this resolution calls on governments to "adopt guidelines for public and occupational EMF exposure that reflect the Precautionary Principle."

Many scientists are now comparing this radiation hazard and the widespread lack of recognition of its potential danger, to epidemics of the past including tobacco, asbestos and mad cow disease. In all these latter cases they believe many lives would have been saved if a more precautionary approach based on common sense was adopted.

Wireless technology such as cell phones are important in today's world as such technology enables communication over large distances without the cost and inconvenience associated with wired systems. However the radiation emanating from cell phone base stations is dangerous to health and must be appropriately limited. It is therefore noteworthy that the Trinidad and Tobago Bureau of Standards has established a committee to thoroughly investigate the matter and to develop safe cell tower radiation exposure standards for Trinidad and Tobago.

As a region we need to embrace modern technology as we pursue the development of our societies. But in doing so we have a responsibility to the citizens to ensure that that technology is safe.

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