

Concern

Harmful effects of low frequency electromagnetic radiations from power transmission lines on biological systems, particularly on human beings, have been of major concern for quite some time. Using underground electrical power distribution cables in the cities, or the use of metal conduits for electrical wiring in the buildings, are not just architectural niceties or ethics, these are some of the standard engineering methods to reduce unwanted radiations from power lines. Overhead power distribution lines, particularly high voltage transmission lines near sub stations, are notorious for creating high radio noise, electrical noise, radio frequency interference (RFI) or electromagnetic interference (EMI), which are kinds of environmental pollution or electromagnetic pollution. While it is easy to understand water, air or noise pollution or contamination, electromagnetic pollution or radiation is very much esoteric. It is not easily seen, tasted, smelled or felt; but it can be more damaging, something like a silent killer.



HARMFUL LOW FREQUENCY RADIATION FROM POWER TRANSMISSION LINES

There is so much economic dependency and money at stake in providing electrical power that it is not surprising that EMR dangers are played down or simply ignored. Electricity and its distribution and its use dominate all aspects of modern society. But we mostly forget that it kills abundantly by fire and shock and continue to follow unsafe practices at home and offices. Of course,

harmful radiations, particularly low frequency magnetic fields, are much less accepted as potential dangers by the common people. Because of several published scientific studies and changing perceptions, citizens groups in many countries are now opposing the installation of these transmission cables near their homes, schools and communities and are winning court cases to have these lines rerouted. It is not sufficient to

just replace overhead transmission lines by underground lines, it is essential to analyze the spatial and temporal load distribution pattern to ensure efficiency and safety of the entire system.

In a Finnish study on 60 workers in a garment factory, blocking of Melatonin production by 50-60 Hz EM Fields has been reported. Melatonin, basically a natural neurohormone - helps healthy sleep, main-



tains body temperature - reduces cholesterol, blood pressure, growth of breast cancer, and tendency for blood clots - it is a scavenger of free radicals and is anti-cancerous.

The study found melatonin levels on weekday nights lesser than Sunday nights, when they were away from the factory. Tests done at 12 mG (milliGauss) (or 1.2 microteslas) or higher, have demonstrated significant blocking of the inhibitory action of melatonin and Tamoxifen (a widely used anti cancerous medicine).

There is ample evidence that even momentary exposure to EM fields greater than 16 mG increases the risk by a factor of 5, that a woman may have a spontaneous abortion within the first 10 weeks of pregnancy.

Extensive research done by Ahlbom and Feychting, covering twenty-five years and half a million people in Sweden, concluded that children living close to electrical transmission lines with a 2mG exposure level were 2.7 times more likely to develop cancer as compared to unexposed children and those with a 3 mG exposure level were 3.8 times as likely. There are strict laws in Sweden regarding the construction of transmission lines close to residential areas.

Studies done by Demers concluded that electricians, telephone linesmen and electric power workers were six times as likely to develop breast cancer as others not so exposed to radiation from transmission lines. Similarly, Kuijten found that children whose fathers worked as electrical repairmen with EMF exposure, prior to the child's conception, were eight times as likely to develop astrocytomas (brain tumor). Dr Clark Heath of the American Cancer Society states that EMR is linked to childhood cancers and leukemia and experiments on animals have shown birth deformities, behavioral changes, changes in the immune system and other such symptoms.

Electric traction and related power transmission system also creates high level of low frequency EM radi-

ation. Recently, in March 2, 2007, Dr Martin Roosli et al have published their studies done on 20,000 Swiss railway workers, particularly on train drivers (average annual exposure of 21 microteslas or 210 mG). They found significant evidence of exposure-response association for myeloid (bone marrow related) leukaemia and Hodgkin's disease (a type of lymphoma - one of the first cancers to be rendered curable by combination Chemotherapy).

Experts recommend that future developments should adopt a safety limit of 0.2 microteslas. It should be noted that fields below a 220 kV power transmission line may be as high as 20 microteslas, a good 100 times more than the safe limit. Similarly, a couple of microteslas field is quite common in improperly wired homes, etc. It is not very easy to measure or assess these fields without using special meters and devices.

It is better to seek expert advice and get an audit done for doubtful areas, particularly for residential areas, schools and hospitals, located near power sub-stations, transmission lines, metro lines, etc. ■

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