Electric Magnetic Field (EMF) Summarization

In this report, we summarize the topic of EMF and possible human health effects. The intent of this presentation is not to convince the reader that there aren't questions about EMF, but to help the reader make objective decisions about the topic and to learn where credible scientific information on the topic can be obtained . Decision and information based on fact not on fear or misinformation

EMF- Invisible Lines of Force

Electric and magnetic fields, or EMF, are produced by all devises that use, carry, or produce electricity. This includes all of our everyday necessities and tools such as computers, cell phones, household appliances, office equipment, and yes, the wires that transmit and deliver our electricity such as power lines and the wiring in our homes and buildings. Even before the use of electric power, humankind has lived in the presence of natural sources of EMF. Electrical processes are a fundamental part of our central and peripheral nervous systems and the earth itself generates a considerable static (0 Hz) magnetic field of about 500 mG and a static electric field that can rise to several kV/m in dust storms or under thunderclouds. EMF can be imagined as invisible, weightless lines of force that occupy the space around a source. In developed areas, public exposure to EMF is all around us and encompasses a very broad range of field intensities and durations. Because of this invisible exposure, it is often a topic of concern.

Exposure to Electric and Magnetic Fields decreases with Distance

Suppose your standing in your kitchen, waiting for your coffee to brew and warming a donut in the microwave. Out of your window you see two Northwestern Energy lineman working on a large power line. What is your exposure to the magnetic field around the power line and to the magnetic field around your microwave?

- The lineman up near the line is in a magnetic field of about 50 mG, the worker below the line is in a magnetic field of about 4 mG; while you-80 feet away- are in a magnetic field of approximately 1 mG from the power line. If you were standing 1 foot in front of your microwave, your exposure would be about 60 mg. Move another couple feet away and the magnetic field from your microwave would be approximately 4 mG.

EMF and Health Effects

While some may worry about what effects exposure to EMF may have, scientists have conducted extensive research to evaluate the possibility that EMF might have adverse heath effects. Since the early 1960s, research has been conducted in the United States and around the world to determine whether exposure to power frequency EMF has health or environmental effects. The issue of possible health effects from electric and magnetic fields has been the subject of much debate. Many studies have been performed throughout the world with results that are often hard to interpret and sometimes conflicting. While some studies found an association between exposure to magnetic fields and certain types of cancer, other studies have not. To date, the consensus of the numerous and credible scientific organizations that have performed thousands of scientific reviews of the worldwide EMF research is that the evidence does not support the conclusion that EMF is a cause of any long-term adverse health effects. Yet many questions remain. Northwestern Energy supports the continued ongoing research into the EMF health effects debate.

Because many questions about the possible effects of EMF on human health remain, Northwestern Energy relies on the numerous panels of credible expert scientific organizations that study and research the scientific evidence regarding EMF exposure and human health. See below for a list of national and international scientific organizations that provide excellent, easy to read information about EMF and possible health effects. Also attached are FAQ's about EMF from these scientific organizations. Among these organizations are the National Institute of Environmental Health Sciences (NIEHS), the Electric Power Research Institute (EPRI), the National Cancer Institute (NCI), the International Agency for Research on Cancer (IARC) and the World Health Organization (WHO). All of these organizations suggest one mutual understanding. That is, after nearly 30 years of research addressing health outcomes among the general population and workers, there is no conclusive evidence that electric or magnetic fields adversely affect health.

The National Institute of Environmental Health Sciences (NIEHS 2002) summarizes their findings as:

- For most health outcomes, there is no evidence that EMF exposures have adverse effects. There is some evidence from epidemiology studies that exposure to power-frequency EMF is associated with an increased risk for childhood leukemia. This association is difficult to interpret in the absence of reproducible laboratory evidence or a scientific explanation that links magnetic fields with childhood leukemia.

EMF – Policies, Standards, and Regulations

A number of countries and states have adopted or considered regulations or policies related to EMF Exposure. The reasons for these actions have been varied; in general, however, the actions can be attributed to addressing public reaction to and perception of EMF as opposed to responding to the findings of any specific scientific research. The EPA has conducted extensive investigations into EMF related to power lines and health risks. There are no US standards or established regulations. Montana has a long standing electric field limit of 1kV/m at the edge of a transmission right of way and 7kV/m under road crossings. Some other States have similar regulations.

Some internationally recognized associations such as the International Radiation Protection Association (IRPC) in cooperation with WHO, have established recommended guidelines for long term electric and magnetic field exposure. For the general public, these limits are 4.2kV/m for electric fields, and 833 mG for magnetic fields. The American conference of Governmental Industrial Hygienists (ACGIH) has published occupational exposure limits for EMF of 25kV/m and 10,000 mG. All of these limits far exceed the electric and magnetic field values every able to be encountered by the general public by even the largest of transmission lines in the US like 765kV.

Another concept adopted by many organizations and utilities like Northwestern Energy (and recommended by the WHO is referred to as the 'precautionary approach'. This concept takes steps during the siting phase of a project to limit and minimize potential long-term exposure at residences along a transmission right of way. When new transmission projects are sited, these steps are taken into account during the siting process and continue to be accounted for during the design of new facilities so we are in compliance with the State of Montana regulations and far exceed the precautionary international guidelines for all of our transmission lines. In fact the level of magnetic field encountered near most Northwestern Energy transmission lines is far lower than the public experiences from common sources everyday on the streets of our towns and cities.

Proper engineering and siting of transmission lines mitigates concerns raised about EMF.

NorthWestern Energy is committed to the goal of proper placement and maintenance of its transmission lines to benefit people and the environment for years to come. We fully support the complete environmental review and extensive analysis of potential impacts in all areas of the human and natural environment that is be conducted during the ongoing siting of the MSTI project. We are confident that the factual based environmental review and impact analysis will ultimate determine an acceptable final route for this important project.

Where You can get Additional Information

National Institutes of Environmental Health Sciences:
www.niehs.nih.gov/health/topics/agents/emf/
Electric Power Research Institute:
www.epri.com/emf/
the World Health Organization:
www.who.int/peh-emf/en/
the National Cancer Institute:
http://www.cancer.gov/cancertopics/factsheet/Risk/magnetic-fields
the International Agency for Research on Cancer
www.iarc.fr/

NorthWestern™ Energy