



Regulating Power Line EMF Exposure: International Precedents

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INTRODUCTION

Exposure to electromagnetic fields has been a source of concern for residents throughout the world who are living with the advancements of modern technology. The increased use of cellular and wireless technology, electronics, and household appliances in the past decade have meant that people are exposed to more EMF in day to day environments from a variety of sources. Governments have begun to legislate and stipulate regulatory policies regarding the allowable limits of EMF, but the overwhelming majority of such legislation is concerned only with EMF from higher frequency and radio-frequency sources such as telecommunications and microwave ovens.

However, power transmission lines, and other sources which relate to the transmission and generation of electrical energy,¹ emit extremely low frequencies between 0 - 300 Hz. The EMF Research and Public Information Dissemination Program (EMF *RAPID*) of the National Institute for Environmental Health Sciences in the US determined that exposure to extremely low frequency EMF is a “possible” cancer hazard;² however, in 2001, the International Agency for Research on Cancer issued a monograph announcing that as a possible carcinogen, extremely low frequency magnetic fields have statistically been linked to childhood Leukaemia.³ Although not conclusively linked at this time, higher incidents of cancer development have been documented not just among children, but also among adult residents who live or work near high voltage powerlines.

¹World Health Organization, International EMF Project, Fact Sheet No.205, “Electromagnetic Fields and Public Health: Extremely Low Frequency (ELF)” (November 1998) online: World Health Organization <http://www.who.int/docstore/peh-emf/publications/facts_press/efact/efs205.html>.

²EMF *RAPID*, Press Release, “Environmental Health Institute Report Concludes Evidence is ‘Weak’ that EMF’s Cause Cancer” (15 June 1999), online: National Institute for Environmental Health Sciences <<http://www.niehs.nih.gov/oc/news/emffin.htm>>.

³International Agency for Research on Cancer, Monographs on the Evaluation of Carcinogenic Risks to Humans, vol.80, “Static and Extremely Low Frequency Electric and Magnetic Fields” (26 June 2001), online: International Agency for Research on Cancer <<http://www-cie.iarc.fr/htdocs/announcements/vol80.htm>>.

Currently, there is not a great deal of legislation in the international community which pertains specifically to extremely low frequency EMF. Yet, the number of citizens' groups which have been established around this problem is strong evidence of the concern about power lines endangering the lives of adults and children.

Because the overwhelming majority of related legislation pertains to the regulation of higher-frequency EMF, compiling a list of legislation and policy specific to low-frequency EMF has been difficult. While a number of jurisdictions and legislative actions have been highlighted here, this is not an exhaustive survey as legislation continues to evolve and develop with regard to EMF. A further guide to standards set by other countries, whether legislated or recommended, may be found on the World Health Organization website. Furthermore, the Union of the Electricity Industry (EURELECTRIC) has produced "EMF Exposure Standards Applicable in Europe and Elsewhere" (Appendix I) which may be helpful.

NOTE: Some sources cited in this document refer to magnetic fields by microTesla, others use milliGauss. For the sake of clarity, 1 microTesla (μT) = 10mG⁴

⁴Denis L. Henshaw, "Why we need prudent avoidance of exposure to elevated levels of magnetic fields associated with the electrical supply", online: Human Radiation Effects Group, University of Bristol <<http://www.electric-fields.bris.ac.uk/MagneticFieldStrength.htm>>

INTERNATIONAL

World Health Organization

In response to increasing concerns regarding public health about exposure to an increasing variety of EMF sources, the World Health Organization in 1996 launched the International EMF Project, which brought together a number of national and international agencies from many Member States to determine recommendations regarding the effects of EMF exposure to health. The aim of the Project is to provide a coordinated international response to EMF concerns⁵ and produce harmonized standards of exposure.

In March 2000, the WHO published a Backgrounder discussing cautionary policies as they relate to EMF regulation. The document observes that many governments have adopted the Precautionary Principle, a “risk management policy applied in circumstances with a high degree of scientific uncertainty” where it has been determined that there is a need to reduce the risk of harm, usually through provisional policies, until research provides a conclusive answer. Other countries have adopted the Prudent Avoidance approach, whereby even without any demonstrable risk, the most achievable low-cost measures will be taken to reduce EMF exposure. This tends to take the form of voluntary recommendations by governments. In October 2001, the World Health Organization endorsed Prudent Avoidance with regard to exposure to powerline EMF, stating that countries should be considering the exposure to people when making decisions regarding the siting of power lines.⁶ It is worth noting, however that although Prudent Avoidance implies that governments and utilities companies must take steps to reduce exposure, they are only required to do so at the least cost to them.

⁵World Health Organization, International EMF Project, “Project Objectives”, online: World Health Organization <http://www.who.int/peh-emf/project/EMF_Project/en/index1.html>.

⁶World Health Organization, International EMF Project, Fact Sheet No.263, “Electromagnetic Fields and Public Health: Extremely low frequency fields and cancer” (October 2001), online: World Health Organization <http://www.who.int/docstore/peh-emf/publications/facts_press/efact/efs263.html>.

International guidelines on the exposure limits for EMF were developed by the International Commission on Non-Ionizing Radiation Protection (ICNIRP), a partner in the International EMF Project, in 1998. These guidelines set the current standard and have been adopted by a number of WHO Member States. It is notable however that though the guidelines set limits based on health effects due to exposure to EMF, the limits reflect only detrimental harm as a result of short-term acute exposure.⁷ They do not address the issue of chronic exposure to extremely low frequency EMF that occurs from having to live under or near powerlines. As a result, the limit recommended by the ICNIRP for the public at 100 μ T (1000mG) is considerably higher than 0.4 μ T (4mG), the level at which there appears to be a statistical link with a doubled risk of development of childhood leukaemia. Studies have even shown that an increased risk of cancer is evident at 0.2 μ T (2mG).⁸

A presentation by Dr. Marc Seguinot of the European Commission⁹ stated that most countries now have some kind of protection framework, though not uniform. Only Spain, Sweden and the UK have a legally binding framework regarding EMF. In general, countries have adhered to the ICNIRP guidelines, and several countries, such as Italy, Belgium, Sweden and Switzerland, have taken a precautionary approach in addition to, or instead of ICNIRP guidelines.

⁷Fact Sheet No.263, *supra* at note 6.

⁸Denis L. Henshaw, "NRPB Consultation Document Issued 1 May 2003, Proposals for Limiting Exposure to Electromagnetic Fields (0 - 300 GHz): Comments from Professor Denis L. Henshaw" at 10, online: <<http://www.electric-fields.bris.ac.uk/dlhcomments.pdf>>

⁹Dr. Marc Seguinot, "EMF Public Protection: Presentation and Follow-up of the Community Initiatives" (Presentation at the Conference on Community Regulatory Aspects of Health Protection in the field of Non-ionising Radiation, November 2001), online: European Commission <http://europa.eu.int/comm/health/ph_determinants/environment/EMF/seguinot_overview_en.pdf>

European Union

In 2004, the European Council issued Directive 2004/40/EC¹⁰ regarding minimum health and safety requirements regarding the exposure of workers to EMF. Although not applying to the general public, the Directive draws on related scientific studies on the health impact of prolonged and acute exposure to EMF. According to an article in the Occupational Safety & Health Daily, the legislation was initially proposed by the executive European Commission in 1992 but at the time, “the provisions on electromagnetic fields were challenged by national ministers who questioned whether sufficient scientific data was available as a basis for practicable legislation.” According to the article, “the EMF proposals were revived in 2002, after new scientific advice on potentially acute health effects from exposure to powerful, low-frequency EMF, as well as from radio and microwave sources.”¹¹ The governments of the member states of the European Union have until 2008 to implement measures in compliance with the directive.

With regard to the general public, the European Council issued Council Recommendation 1999/519/EC¹², setting a limit on the exposure of EMF to the general public at frequencies of 0 MHz to 300 GHz to the same limits recommended in the ICNIRP guidelines. A subsequent report by the European Council shows how the Council Recommendation has been

¹⁰EC, *Council Directive 2004/40/EC of 29 April 2004 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields)*, [2004] OJL 184 of 24.05.2004.

¹¹“European Parliament Approves Measure Protecting Workers from EMF Exposure”. *Occupational Safety & Health Daily* (31 March 2004), online: BNA Monitoring Service <<http://subscript.bna.com/SAMPLES/ohd.nsf/0/2ad8aeea5fa495c385256e6800084c45?OpenDocument>>.

¹²EC, *Council Recommendation 1999/519/EC on limitation of exposure of the general public to electromagnetic fields 0 Hz-300 Ghz* [1999] OJL 199 of 30.7.1999.

implemented through legislation at the national level by Member and Accession States.¹³

Individually, some states have issued legislation and regulatory policies specifically addressing power line and extremely low frequency EMF which have cited the potential harms to the health of their people. The majority of European countries have simply adopted the ICNIRP guidelines on low frequency EMF in their own policies, pursuant to the Council Recommendation.

While all of the countries have implemented the Council Recommendation's limits and the ICNIRP limits, some countries have also set up zones where maximum exposure levels are reduced, such as around schools, parks, and schools. These zones are considered above and beyond the national regulations passed in order to comply with the Council Recommendation.

Spain

The regional government of Madrid issued regulations in 1998 which prohibited the construction of power lines near residential areas, schools and public gardens and proposed to do away with existing lines in metropolitan areas.¹⁴ This came at the heels of a report by El Defensor del Pueblo, an independent institution reporting to the Spanish Congress of Deputies, which drew attention to the health risks of exposure to power lines.

Sweden

In 1992 the Department of Electrical Safety of the National Board for Industrial and Technical Development stated that Sweden would soon set exposure standards for new homes near power lines, and for all new electrical facilities, and that these standards

¹³EC, Commission, *Implementation report on the Council Recommendation limiting the public exposure to electromagnetic fields (0 Hz to 300 GHz)*, online: European Commission <http://europa.eu.int/comm/health/ph/programmes/pollution/implement_rep_en.pdf>.

¹⁴Richard W. Woodley, "EMF Struggles Around the World," online: Bridlewood Electromagnetic Fields (EMFs) Information Service <<http://www.feb.se/Bridlewood/WORLD.HTM>>.

might require average annual exposures to be in the neighbourhood of 2 mG. This came after an announcement by the National Board for Industrial and Technical Development that they intended to henceforth “act on the assumption that there is a connection between exposure to power frequency magnetic fields and cancer, in particular childhood cancer.” In addition, Swedish regulators have declared that they will propose a ban on the construction of houses within 330 feet of high-voltage lines. (This ban is now in effect.)¹⁵

On September 30, 1992, officials of Sweden's National Board for Industrial and Technical Development formally announced that they intended henceforth to "act on the assumption that there is a connection between exposure to power frequency magnetic fields and cancer, in particular childhood cancer." Sweden became the first country to adopt, from a scientific viewpoint, the principle of prudent avoidance and prohibits high voltage powerlines near schools, residential areas, hospitals and daycare centres.

In 1998, Sweden's Environmental Code (1998:808) contained a provision which adopted a general precautionary principle with regard to ionising and non-ionising radiation.¹⁶ An advisory limit of 0.2µT was introduced.¹⁷

United Kingdom

In 1999, the UK's National Radiological Protection Board (NRPB) lowered its maximum recommending exposure limits by adopting the Commission on Non-Ionizing Radiation Protection (ICNIRP)'s standards for maximum exposure to EMF from power lines.

¹⁵Power Line Task Force, “World EMF Struggles”, online: Power Line Task Force <www.powerlinefacts.com/power%20line%20resistance%20worldwide.htm>. (“PLTF”)

¹⁶Implementation report, *supra* at note 13, 33.

¹⁷Henshaw, *supra* at note 8, 10.

A news report stated that the NRPB was to set issue new recommendations in 2002 calling for the government to require homes to be built at least 150 metres away from overhead power lines or require them to be buried underground.¹⁸

Because of health concerns, Spain, Norway, Sweden, the UK, and Australia now prohibit the construction of power lines within 300 feet of homes.

In the UK, construction of new power lines through residential neighbourhoods requires the express permission of the Secretary of State. However, several cases where health risks were considered at length, permission to construct high voltage power lines had been granted nevertheless.¹⁹

Luxembourg

Circular No.1644 (ref. 26/94) was introduced in 1994 provided a recommendation to local authorities that “land in the immediate proximity of high voltage power lines should no longer be approved as building land.”²⁰

Australia

“In 1997, Australia adopted a policy of Prudent Avoidance with regard to new transmission lines, with measures described by the government as ‘general guidance’ to be implemented ‘without undue inconvenience’. Measures that can be taken at ‘modest cost’ include routing power lines away from schools, and phasing power line conductors

¹⁸Jeremy Watson, “Cancer link forces U-turn on power lines near homes,” Scotland on Sunday (27 October 2002), online: Power Line Task Force <http://www.powerlinefacts.com/NRPB_to_limit_to_150_meters.htm>.

¹⁹National Grid EMF, “Consent for new lines”, online: National Grid <http://www.emfs.info/expert_Consent.asp>.

²⁰Implementation report, *supra* at note 13, 29.

to reduce magnetic fields near their rights of way.²¹

A recent case, *Energex Ltd v. Logan City Council et al*²², the Planning and Environment Court of Queensland held that although there was no absolute proof that exposure to magnetic fields caused an increased risk of childhood leukaemia, nevertheless the policy of "prudent avoidance" should apply.²³

Austria

In compliance with the Council Recommendation, Austria implemented a standard for low frequency fields (Standard ÖNORM 1119, covering 0Hz - 30kHz).²⁴ A more recent 2004 report by the Federal Ministry of Agriculture, Forestry, Environment and Water Management, Department of Radiation Protection, stated that there is a legal framework for the construction and operation of power lines in place, and the *Trade, Commerce and Industry Regulation Act* governs the protection of the general public in this regard. Although there are no specific laws regarding the protection from exposure to EMF, The report stated that any radiation protection laws to be enacted would be based on the outcome of the EMF project at WHO.²⁵

Finland

Finland has long legislated with regard to the regulation of EMF, first implementing

²¹World Health Organization, Backgrounder, "Cautionary Policies", (March 2000), online: <http://www.who.int/docstore/peh-emf/publications/facts_press/EMF-Precaution.htm>.

²²*Energex Ltd v. Logan City Council & Ors*, [2002] QPEC 1.

²³Henshaw, *supra* at note 4.

²⁴Implementation report, *supra* at note 13, 16.

²⁵J.K. Honenberg and K. Stangl, "Austrian (provisory) report" (Paper presented to the EIS-EMF Project), 02 Sept 2004), online: European Commission Joint Research Centre <http://forum.europa.eu.int/Public/irc/jrc/jrc_eis_emf/library?l=/preliminary_country&vm=detailed&sb=Title>.

legislation on protection from non-ionising radiation in 1986. As of 2001, the Ministry of Social Affairs and Health was drafting a decree to recommend maximum exposure limits for up to 100kHz frequencies in order to bring them in line with the ICNIRP guidelines.²⁶

France

In compliance with the Council Recommendation, a legally binding Order of 17 May 2001 (*Journal Officiel* of 12 June 2001) was issued which set out technical requirements and exposure compliance limits for power supply systems.²⁷

Germany

Similarly, the Pollution Control Order, 26th BImSchV, introduced exposure limits for low-frequencies, but required that other low-frequency field emission sources must be taken into account.²⁸

Italy

The “Framework Act 36 on protection against exposure to electric, magnetic and electromagnetic fields” Law No.36 of 22-2-01 (Official Gazette 55 of 7-3-2001) provides a number of measures against exposure to EMF. The implementation of the Act is carried out by a series of prime ministerial decrees, and expressly provides that a number of existing legislation in the area remains applicable under new decrees that are issued. Among the existing decrees that were applicable as at 2001 is the Prime Ministerial Decree of 23-4-92 on “Maximum limits for exposure to electric fields and magnetic fields generated at the nominal power frequency (50Hz) in residential environments and external environments” (Official Gazette 104 of 6-5-1992) which

²⁶Implementation report, *supra* at note 13, 18.

²⁷Implementation report, *supra* at note 13, 20.

²⁸Implementation report, *supra* at note 13, 22.

provided for clearances between power lines and residential buildings as a precautionary measure.²⁹

As of 2000, three regions of Italy (Veneto, Emilia-Romagna, Tuscany) have imposed regulations limiting the magnetic fields of powerlines being erected near schools, houses and any other places where people spend more than four hours per day to no more than 0.2µT (4mG). This regulation has been held by the Italian Constitutional Court as legally binding.³⁰

Italy's precautionary approach is more strict than the European Council Recommendation's requirements.³¹

Latvia

Latvia introduced a national standard, LVS ENV 50166 - 1:1995 "Human exposure to electromagnetic fields: low frequencies (0Hz - 10kHz)" limiting to exposure to EMF in 1995. Latvia then harmonized the standard with that of the Council Recommendation.³²

Republic of Lithuania

The legally binding Lithuanian Hygiene Norm (HN) 104:2000 was approved by the Minister of Health in 2001 pertaining specifically to "protecting the public against electromagnetic fields emitted by overhead power lines," implementing the limits set by the Council Recommendation.

²⁹Implementation report, *supra* at note 13, 27.

³⁰Henshaw, *supra* at note 8, 10.

³¹Seguinot, *supra* at note 9.

³²Implementation report, *supra* at note 13, 38.

Romania

The National Regulatory Authority for Energy has set standards for the construction of overhead powerlines with voltages in excess of 1000V (1kV) (PE 104/1993), and for the planning and implementation of electric cable networks (PE 107/1995).³³

Switzerland

In 2000, Department of Environment, by approval of the Swiss federal government, passed an Ordinance setting out standards regarding the protection of citizens from exposure to non-ionising radiation. This included reference to radiation from stationary installations such as overhead transmission lines. However, the standards set follow ICNIRP guidelines.³⁴

³³Implementation report, *supra* at note 13, 42.

³⁴Switzerland, Bundesrat, Ordinance on Protection from Non-Ionising Radiation (23 Dec 1999), online: World Health Organization <http://www.who.int/docstore/peh-emf/EMFStandards/who-0102/Europe/Switzerland_files/table_sz_files/Swiss_Ordinance.pdf>.

UNITED STATES

Currently, there are no federal laws regulating low frequency EMF in the United States. Only state legislation, local government ordinances, public utility commission policies, and court orders have regulated exposure in this regard.³⁵

While not explicitly recommending Prudent Avoidance, the National Institute for Environmental Health Sciences (NIEHS) has suggested that utilities companies ought to “continue its practice of siting power lines to reduce exposures and continue to explore ways to reduce the creation of magnetic fields around transmission and distribution lines . . . ”³⁶ This recommendation has been implemented in a number of state level bills introduced and passed over the last decade.

Connecticut

In June of 2004, the *Act Concerning Electric Transmission Line Siting Criteria*³⁷ was passed, which provided that overhead electric transmission lines are prohibited from being located within a specified buffer zone area near residential areas, schools, day care facilities, youth camps or playgrounds in Connecticut. The Act provides that a buffer zone must be at a minimum, be the existing right of way, and requires that assessments of the impact of EMF must be carried out for each proposed new transmission line. In a press release just prior to the passing of the bill, Representative Raymond Kalinowski stated that, “Where feasible, these lines will be buried, or otherwise given a wide buffer zone or installed with other safety technology, especially

³⁵Scott H. Strauss and Susan M. Bernard, “Electromagnetic Fields (EMF) and Health Hazards”. *Environmental Law Institute* (1991), online: Dr. Steven Mizrach <<http://www.fiu.edu/~mizrachs/EMF-Hazards.html>>. (“Strauss and Bernard”)

³⁶“Cautionary Policies”, *supra* at note 21.

³⁷US, HB 5418, *An Act Concerning Electric Transmission Line Siting Criteria*, Gen. Assem., Reg. Sess., Conn., 2004 (enacted), online: Connecticut General Assembly <<http://www.cga.ct.gov/>>.

in residential areas and near schools, day care centres, youth camps or playgrounds.”³⁸

More recently, Senator Edward Meyer called for the undergrounding of 345kV power lines in a press release issued February 14, 2005. Senator Meyer stated, “I don’t mind, and I know my colleagues don’t mind, helping other areas of the state, but the safety of our residents and the environment in our districts... should not suffer for it.” In addition to undergrounding the power lines, new provisions were proposed which stipulated that existing buffer zones could not be reduced without a public hearing and majority vote by the legislative body.³⁹

In 1994, legislation was enacted which gave consumers a voice in relation construction of powerlines. A local citizens group, Alliance to Limit Electromagnetic Radiation Today (ALERT), assisted in the drafting of the new legislation.⁴⁰

California

In 1993, Representative George Miller introduced the *Children’s Electromagnetic Field Risk Reduction Act* in the House of Representatives, calling for “prudent steps to protect our children’s health until such time as the Federal Government and scientists determine that electromagnetic fields created by transmission lines are not a threat to our children’s health.” The proposed legislation would have established “a national policy to prohibit the construction and operation of new schools, and child care facilities, on

³⁸Connecticut House Republicans, Press Release, “Rep Kalinowski Sponsors Legislation to Bury Electric Transmission Lines in Residential and School Areas” (3 May, 2004), online: Connecticut House Republicans <<http://www.housegop.state.ct.us/pressrel/Kalinowski/2004/press100b.htm>>.

³⁹Connecticut Senate Democrats, Press Release, “Meyer Calls for More Underground Burial of Transmission Lines Through Middlesex, New Haven Counties” (14 February 2005), online: Senate Democrats <<http://www.senatedems.state.ct.us/pr/meyer-050214.html>>.

⁴⁰PLTF, *supra* at note 15.

property where the EMF exceeds an average of two milliGauss per day.”⁴¹ The bill did not pass, but its goal continues to be relevant today.

Following the introduction of this act, the California Public Utilities Commission adopted an interim EMF policy requiring utilities companies to eliminate “unnecessary” exposure to EMF from power lines, and provided funding for further EMF research and education.⁴²

In 1989, the California State Department of Education had adopted a policy for siting schools near power lines, and noted that a "conservative approach" should be taken when evaluating sites near power line easements. The Department of Education stipulated boundary limits depending on the voltage of the transmission lines: 100 feet from the edge of easement for 100-110 kV lines, 150 feet for 220-230 kV lines and 250 feet for 345 kV lines.⁴³

Zoning Ordinance No.90-23, issued in Irvine in 1990, provided that residential developments or child care facilities may not be developed within a 4mG boundary along a power line right of way.⁴⁴

⁴¹US, Bill HR 1494, *Children's Electromagnetic Field Risk Reduction Act*, 103d Cong., 1993.

⁴²PLTF, *supra* at note 15.

⁴³Lawrence Smith, *Markham to Newmarket Transmission Proposal* (2004) at 6, online: Stop Transmission Lines Over People <<http://www.stop-emf.ca/stopinfo/option2.doc>>.

⁴⁴Jack M. Lee, *Environmental and Biological Effects of Transmission Lines: A Review*, Bonneville Power Administration (1996), in Rebuttal and Application for Reconsideration of BCUC's Decision/response dated October 25, 2001 re: UtiliCorp Networks Canada (BC) Ltd. (Formerly known as West Kootenay Power Ltd., BCUC's response to Complaint - Routing of 230 kV Transmission Lines through Ootischenia Area, at note 45. ("BPA")

Washington

Citizen's Initiative No.4-90 in Whatcom County in 1990, was the first successful power line siting referendum in the US, and succeeded in restricting powerlines exceeding 115kV to industrial areas only.⁴⁵

In 1995, the City Council of Camas adopted Ordinance No.2030, which provided that new transmission lines must be designed, built and operated using prudent avoidance to EMF.⁴⁶ Following this ordinance, a citizens' group in Cusick City proposes a similar ordinance which prohibited construction of overhead transmission lines within city limits and stipulated prudent avoidance measures.⁴⁷

Rhode Island

The town council of East Greenwich in 1990 banned the construction of new powerlines above 60kV for three years in response to widespread citizen concern over EMF exposure from proposed 345 kV and 115kV lines. This was the first moratorium on power line construction in the US. Two other Rhode Island towns, Coventry and Foster, followed suit.⁴⁸

Wisconsin

In 1991, Wisconsin followed in Rhode Island's footsteps when representatives also introduced legislation calling for a three-year moratorium on new lines above 60 kV, citing health concerns. The bill would require the Wisconsin Public Service Commission (PSC) to conduct EMF research and measurement surveys during the moratorium. At a

⁴⁵PLTF, *supra* at note 15.

⁴⁶BPA, *supra* at note 44.

⁴⁷PLTF, *supra* at note 15.

⁴⁸PLTF, *supra* at note 15.

press conference about the bill, Representative Maxine Hough stated, "It is dangerous and foolhardy to build more high voltage power lines . . . until we have adequate answers to the health concerns."⁴⁹

The following year, the Wisconsin Public Service Commission issued the statement that utilities companies must "use best available control technology" to reduce the EMF levels from transmission and distribution systems.⁵⁰

Tennessee

In 1991, Town Ordinance No. 91-3 issued in Brentwood provided that new transmission lines of 120 kV or greater "shall not allow spillage of the EMF associated with such transmission lines in excess of 4 mG beyond the legal right of way boundaries." Existing transmission lines were required to be brought into compliance within five years.⁵¹

Colorado

Colorado Public Utilities Commission formally adopted the Prudent Avoidance Principle in 1993, requiring all utilities companies to now consider the health effects of power line EMF.⁵²

⁴⁹PLTF, *supra* at note 15.

⁵⁰PLTF, *supra* at note 15.

⁵¹BPA, *supra* at note 44.

⁵²PLTF, *supra* at note 15.

Georgia

The *Transmission Facility Siting Act*, enacted in 2003, calls for the health and safety of the public to be taken into consideration . . . when siting a transmission facility.⁵³

Illinois

In 1991, a Wilmette Town Ordinance restricted low frequency (60Hz) fields emitting from a Transit Authority station to 2mG and called for prudent avoidance.⁵⁴ In the same year, the mayor of Chicago denied Commonwealth Edison permission to erect a 345 kV line through the downtown core, citing the potential of EMF to endanger the health of people who have to live and work near the proposed line.⁵⁵

Florida

In 1989, Florida was the first state to set standards for magnetic fields from power lines.⁵⁶ However, the standards were challenged in the very same year; Hillsborough County claimed that the standards disregarded studies showing the potential link between increased cancer risk and exposure to magnetic fields lower than specified and that they “do not further the statutorily mandated goal of protecting public health and welfare.”⁵⁷

The Florida Department of Environmental Protection’s 2003 Annual Report on EMF Research indicated that the Florida Administrative Code currently stipulates a maximum

⁵³US, SB 359, *Transmission Facility Siting Act*, 2003-2004, Reg. Sess., Ga., 2003, online: Georgia General Assembly <http://www.legis.state.ga.us/legis/2003_04/sum/sb359.htm>.

⁵⁴BPA, *supra* at note 44.

⁵⁵PLTF, *supra* at note 15.

⁵⁶Conway Corporation, “Conway Corporation thinks you really ought to know about... Electromagnetic Fields,” online: Conway Corporation <<http://www.conwaycorp.com/electric/services/emf.html>>.

⁵⁷PLTF, *supra* at note 15.

EMF range for new transmission lines as between 150 - 250 mG.⁵⁸

New Jersey

In 1995, the New Jersey Commission on Radiation Protection proposed regulations designed to reduce the magnetic fields from new or modified electric power transmission lines of 100 kV and higher voltages.⁵⁹

Oregon

In 1991, the City Council of Ashland adopted Resolution no. 91-15 which provided for a policy of prudent avoidance in relation to the siting and construction of electrical facilities, on the assumption that EMF may pose a health risk.⁶⁰

Utah

The City Council of Sandy issued Ordinance No.96-9 in 1996 calling for prudent avoidance similar to what was described in the Camas, Washington ordinance.⁶¹

Caselaw

The United States has seen a considerable number of civil litigation cases pertaining to exposure to EMF and the perceived damage to health. Since 1985, school districts and parents have taken utilities companies to court and sought rulings which closed off sections of schools and playgrounds as a result of an increased rate of development of cancer among children

⁵⁸Florida Department of Environmental Protection, "2003 Annual Report on EMF Research" (12 November 2003) at 6, online: Florida Department of Environmental Protection <http://www.dep.state.fl.us/siting/Programs/electric_magnetic_rpt_2003.pdf>.

⁵⁹New Jersey Commission on Radiation Protection, "Proposed New Jersey Regulations Governing Magnetic Fields From Electric Power Transmission Lines," online: EMF-Link, Infoventures <<http://infoventures.com/emf/legal/nj/njsc44a.html>>.

⁶⁰BPA, *supra* at note 44.

⁶¹BPA, *supra* at note 44.

attending schools bordering power lines and transformers. One particular case in Houston, Texas in 1985 resulted in \$25 million in punitive damages where the judge held that the utility company showed "a callous disregard for the safety, health, and well-being of the 3,000 plus children" by locating a 345kV transmission line through school property.⁶² Other cases, such as *Glazer v. Florida Power & Light*⁶³ involved plaintiffs suing utilities companies for the wrongful cancer deaths of family members. The EMF-Link website provides a list of legal cases pertaining to EMF exposure, current to 2002.⁶⁴

⁶²Strauss and Bernard, *supra* at note 35.

⁶³[1996] 671 So.2d 211.

⁶⁴EMF-Link, "EMF Legislation and Litigation," online: EMF-Link, Infoventures <<http://infoventures.com/emf/top/litigate.html>>.

CONCLUSION

Despite the fact that scientific data in the area of EMF from low-frequency sources such as powerlines is still unsettled at this point, many jurisdictions have taken the initiative to legislate in this regard. This appears to be in response to the recommendations of the World Health Organization, and in light of a Council Recommendation by the European Commission. In North America, the United States has had varying degrees of success in regard to instituting legislation relating to EMF exposure, but we have yet to see such lawmaking in Canada. While a report by the ELF Working Group of the Federal-Provincial-Territorial Radiation Protection Committee states that at least three provinces in Canada have set voluntary standards with regard to electrical fields, no mandatory standards have been set with regard to magnetic fields. Furthermore, such standards are set by utilities corporations.⁶⁵ Although Canada purports to follow a framework of precaution in its approach to EMF and health, this revolves around education and research rather than extending that precautionary principle to legislation addressing the limits of exposure to low frequency EMF.

Although Health Canada is involved with the World Health Organization's International EMF Project, there are currently no guidelines regarding federal standards of exposure of the general public to EMF from electrical installations, much less legislation in this regard.⁶⁶ This state of matters was confirmed in a recent press release from Ontario MP Frank Klees, who confirmed in the legislature that there are in fact no federal guidelines regarding EMF. Furthermore, the Minister of Health has refused to develop national standards regarding EMF

⁶⁵Federal-Provincial-Territorial Radiation Protection Committee, "Health Effects and Exposure Guidelines Related to Extremely Low Frequency Electric and Magnetic Fields - An Overview" at 257, online: BC Centre for Disease Control <<http://www.bccdc.org/content.php?item=196>>.

⁶⁶Letter from Gordon Taylor Lee, Director of Policy, Health Canada to Sue Fusco, Chair, Stop Transmission Lines Over People (STOP) (8 Dec 2004), online: Stop Transmission Lines Over People <<http://www.stop-emf.ca/stopinfo/healthcanadaletter.pdf>>.

health concerns.⁶⁷

Nevertheless, citizens' groups across Canada have succeeded through lobbying efforts to stop the construction of new transmission lines near residential areas. In early 2005, Ontario's STOP-EMF saw a successful withdrawal of Hydro One's application to build a 230kV line near residences and a private school.⁶⁸ Subsequently, the BC Transmission Corporation also withdrew plans to upgrade existing lines running through a residential area of Tsawwassen to 230kV lines after considerable lobbying by Tsawwassen Residents Against Higher Voltage Overhead Lines.

Most European nations now have implemented standards following the guidelines of the ICNIRP, however excessive they may be; many others have implemented stricter standards, particularly around sensitive zones such as schools, parks and hospitals. Similarly, siting criteria legislation in the United States have provided that power lines must be a stipulated distance away from such areas, in order to minimize the exposure. Where Canada lacks such legislation, it is necessary to consider the precedents of other nations which have made EMF from low frequency sources such as power lines a legislative issue. Other nations have shown a willingness to take the health of their people to task and regulate what is potentially a great harm. Shouldn't Canada be counted among them?

⁶⁷Frank Klees MPP, Press Release, "Minister of Health Refuses Request for EMF Study" (9 December 2004), online: Frank Klees MPP
<http://www.frank-klees.on.ca/news/2004/dec09_04EMFstudy.htm>.

⁶⁸Stop Transmission Lines Over People, online: <<http://www.stop-emf.ca/customer/home.php>>.

APPENDIX I

Environmental & Society Working Group, "EMF Exposure Standards Applicable In Europe and Elsewhere," (Brussels: Union of the Electricity Industry - EURELECTRIC, May 2003).

This document provides a useful summary of legal and recommended standards in a number of countries which apply specifically to power frequencies.