



STOP SMART METERS AUSTRALIA INC

Reg. No. A0059190N ABN 14 717 028 504

30 October 2015

Ms Jane Burkitt
ENA Industry Standards Officer
Energy Networks Association
By email to: info@ena.asn.au

Dear Ms Burkitt

Thank you for the opportunity to comment on the Energy Network Association's draft *EMF Handbook*.

Stop Smart Meters Australia (SSMA) is a volunteer-based advocacy group which incorporated as an Association in April 2013 in response to widespread community objection to the Victorian State Government mandated Advanced Metering Infrastructure (AMI) rollout. Paramount within our legal purposes is to provide support and assistance to people who are opposed to smart meters due to the impact of advanced metering infrastructure emissions on the health of Australians. A number of people who have been adversely affected by pulsed microwave radiofrequencies (RF) from smart meters also claim to have subsequently become sensitised to power frequency EMFs.

SSMA commends ENA on its aim of providing the Australian electricity distribution and transmission industry with information to manage the EMF issue responsibly. Areas within the handbook which would benefit from improvement follow:

1. INTRODUCTION

Paragraph i: The initial paragraph has conflated natural electromagnetic fields (EMFs) with manmade EMFs. As these two sources have different properties and, in consequence, different effects on humans and the environment, SSMA believes it is important that this point is clarified. For instance, ENA might consider explaining that the Earth's magnetic field is a static field and therefore current only flows in one direction. In contrast, "time-varying electromagnetic fields are produced by alternating currents (AC)" (World Health Organization n.d. a). In Australia, AC current changes its direction 50 cycles (100 times) per second.

Paragraph ii: This statement: "The body of scientific research on EMF does not establish that exposure to EMF at levels below the recognised international guidelines cause or contribute to any adverse health effects", does not present a balanced summation of the

conclusions of scientific research on EMFs. In particular, a large body of studies has shown that adverse health effects are associated with long-term exposure at limits which are a fraction of ICNIRP's 2010 guidelines. For instance, ICNIRP's 2010 *Guidelines for Limiting Exposure to Time-Varying Electric and Magnetic Fields (1 Hz – 100 kHz)* states that "epidemiological studies have consistently found that everyday chronic low-intensity (above 0.3–0.4 μ T) power frequency magnetic field exposure is associated with an increased risk of childhood leukemia" (ICNIRP 2010).

Dr Paul Héroux, who commenced his career involved in the design of high-voltage power lines prior to following his research interests into the effect of EMFs on health, summarises some of the research evidencing adverse biological outcomes as a result of exposure to extra-low-frequency radiation in his McGill University text titled *Physical Health Hazards: Health Effects of Electromagnetism* (Héroux 2013, pp. 1-22).

Paragraph iv: This paragraph needs to be amended in order to include reference to the classification by the World Health Organization's IARC (International Agency for Research on Cancer) in 2001 of ELF as a category 2B possible human carcinogen in relation to childhood leukaemia. Specifically, the IARC concluded that "Extremely low-frequency magnetic fields are *possibly carcinogenic to humans (Group 2B)*" (World Health Organization, IARC 2002, p. 338).

2. SCOPE

SSMA views the exclusion of radiofrequency (RF) fields and smart meters from the scope of the handbook as problematic; although SSMA acknowledges that this handbook is focused on exposure from 50 Hz sources owned or operated by the Australian electricity distribution and transmission industry, and that ENA has covered smart meters elsewhere, today's paradigm involves (often unintentional) emission of RF by electricity networks. Given the ubiquity of high-frequency voltage transients and harmonics (which may range into radiofrequency spectrum) on distribution lines and often, in consequence, on household wiring, SSMA considers that it is necessary to comment on the biological implications of this exposure. SSMA also considers that the ENA should give specific consideration to unwanted EMFs which are entering buildings as a result of industry practices.

Many modern devices, including smart meters, create the unintended generation of harmonics. The Institute of Electrical and Electronic Engineers (IEEE) has stated that "Harmonic pollution is a growing problem caused by the widespread use of power supplies and other non-linear loads. It can result in power loss and equipment damage and it may also be related to **environmental safety issues**" (IEEE 2011, emphasis added).

In the case of smart meters, the switch-mode power supply leads to the introduction of frequencies above 50 Hz onto household wiring. In addition, where wireless smart meters have been deployed, some of the microwave signal may be conducted onto household

wiring. These two sources of EMF pollution have not been covered in ENA's information sheet titled *Smart Meters and Possible Health Effects*.

Isotope Wireless's *Report on Examination of Selected Sources of Electromagnetic Fields at Selected Residences in Hastings-on-Hudson* concluded that it is likely that some of the microwave signal from smart meters is being conducted into residences by this means (Isotope Wireless 2013). They pointed out the possibility of the emissions radiating from outlets and along house wiring. In addition, Isotope Wireless's testing showed that "when in close proximity to conductive objects (house wiring, outlets, metal lamp) the measured levels increased." They attributed this to the known behaviour of objects to reradiate RF energy.

3. ELECTRIC AND MAGNETIC FIELDS

Our comments in regard to ENA's draft Introduction also apply to this section.

In addition, ENA's statement that, "For a source to produce enough energy to damage DNA, it must be at a frequency of approximately ten thousand billion Hertz", requires qualification; in fact, although non-ionising radiation does not have enough energy to directly break chemical bonds, a wide range of scientific studies have evidenced both single strand and double strand DNA damage as a result of exposure to frequencies considerably below this threshold. See pp. 19-24 and pp. 55-57 of Dr Karl Maret's commentary (Maret 2012).

The statement that, "By comparison, EMF from the use of electricity is at a frequency of only 50 Hertz", also requires qualification. As per our opening comments in relation to the scope of the draft, although this is the intended situation, the reality is that other (higher) frequencies also populate distribution lines and household wiring.

4. THE SCIENCE OF EMF AND HEALTH

Section 4.1, which quotes conclusions from public health authorities, requires further explanation; as it stands, this section provides a distorted understanding of the science.

For instance, ENA's quote from ICNIRP's 2010 guidelines (which states that "It is the view of ICNIRP that the currently existing scientific evidence that prolonged exposure to low frequency magnetic fields is causally related with an increased risk of childhood leukemia is too weak to form the basis for exposure guidelines. In particular, if the relationship is not causal, then no benefit to health will accrue from reducing exposure") relates to the fact that a **mechanism** has not been identified for explaining the "consistent pattern of a two-fold increase in childhood leukaemia associated with average exposure to residential power-frequency magnetic field above 0.3 to 0.4 μT " (World Health Organization 2007).

However, the identification of mechanisms often lags many decades behind the recognition of a casual relationship. The European Environment Agency's former Senior Science

Advisor, David Gee, pointed out (in relation to the Group 2B rating set by IARC for wireless transmissions) that "it is worth noting that during over 30 years of classifying cancer risks, covering around 900 agents, IARC very rarely downgrades its judgements: in most cases tentative carcinogens become more certain carcinogens as time since first exposures and further research accumulates" (Gee 2012, p. 2).

Given that section 4 of the draft is titled as being on the science of EMF and health, SSMA considers that it would be more appropriate for ENA to provide ICNIRP's subsequent quote (which is included in the same document that ENA is quoting from) that, "epidemiological studies have consistently found that everyday chronic low-intensity (above 0.3–0.4 μ T) power frequency magnetic field exposure is associated with an increased risk of childhood leukemia" (ICNIRP 2010).

Similarly, in relation to the quote from the World Health Organization's webpage (World Health Organization, n.d. b), SSMA considers that ENA should include the sentence immediately following the quote (and which is contained in the same paragraph), which states, "However, some gaps in knowledge about biological effects exist and need further research", in order that ENA fairly represents the World Health Organization's viewpoint.

The classification by IARC in 2001 of ELF as a **Group 2B** possible human carcinogen in relation to childhood leukaemia (World Health Organization, IARC 2002, p. 338) should also be specifically referenced by ENA in this section. As noted by the World Health Organization in relation to the 2007 *Environmental Health Criteria* monograph, "The Task Group concluded that additional studies since then do not alter the status of this classification" (World Health Organization 2007).

As detailed in our comments in regard to the scope of the handbook, SSMA also considers that ENA should expand its commentary to include consideration of the effects of RF.

5. EMF GUIDELINES AND EXPOSURE LIMITS

The NHMRC's 1989 interim guidelines on limits of exposure to 50/60 Hz electric and magnetic fields should also be referenced; although rescinded, it is apparent that these guidelines continue to be referred to within the Australian context.

8. PROCESS FOR EVALUATING PRUDENT AVOIDANCE

This section requires inclusion of legal liability issues. As per Dr Bruce Hocking's email of 13 October 2015 to ENA, the decision reached in *Energex Ltd v Logan City Council & Ors*, in relation to a proposed substation next to a predominantly residential area, should be referenced. This decision stipulated a public protection limit not exceeding 4 mG (0.4 μ T) where reasonably practicable in respect of existing feeder lines and, for other locations, this limit was not to be exceeded excepting for a declared state of emergency or; (for a maximum of 14 days per calendar year) a fault condition or [ordinary] emergency or; (for a

maximum of 7 days per calendar year) maintenance work (Planning and Environment Court of Queensland 2002 pp. 19-20).

9. METHODS TO MITIGATE MAGNETIC FIELDS

In line with our comments in regard to the scope of the handbook, SSMA considers that ENA should also provide information on means of mitigation of EMFs within buildings; in particular this should cover where children spend time and where people are sleeping. ARPANSA's document on *Strategies to Reduce Magnetic Field Exposure (Mitigation)* provides useful information.

SSMA trusts that ENA will take on board our comments and looks forward to viewing the completed handbook. In particular, SSMA considers that ENA's handbook should reflect the reality that delivery of 50 Hz electricity, these days, also includes the introduction of other frequencies, ranging up to RF, into buildings.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Janobai Smith', with a stylized flourish at the end.

Ms Janobai Smith, BEc (Monash), Cert. EMF Testing
Advocacy and Policy Advisor

Stop Smart Meters Australia Inc.

E: policy@stopsmartmeters.com.au

REFERENCES

ARPANSA 2006, Strategies to Reduce Magnetic Field Exposure (Mitigation), Available: http://www.arpansa.gov.au/pubs/rps/archived/dr_elf_strategies.pdf

Gee D. 2012, 'The Precautionary Principle, 2012 Supplement', *BioInitiative 2012, A Rationale for Biologically-based Exposure Standards for Low-Intensity Electromagnetic Radiation*, Section 23, Available: http://www.bioinitiative.org/report/wp-content/uploads/pdfs/sec23_2012_The_Precautionary_Principle.pdf

Héroux 2013, 'Health effects of extra-low-frequency radiation', Chapter 4, McGill University Course OCCH-605, *Physical Health Hazards: Health effects of electromagnetism*, Available (12 MB): <https://stopsmartmetersau.files.wordpress.com/2015/10/health-effects-of-electromagnetism-2014.pdf>

ICNIRP 2010, ICNIRP Guidelines for Limiting Exposure to Time-Varying Electric and Magnetic Fields (1 Hz – 100 kHz), *Health Physics* 99(6):818-836; 2010, Available: <http://www.icnirp.org/cms/upload/publications/ICNIRPLFgdl.pdf>

IEEE 2011, *IEEE to Develop Standards Limiting Insertion of Harmonics into Power Grid*, Press Release, Available: <http://standards.ieee.org/news/2011/harmonic.html>

Isotope Wireless 2013, *Report on Examination of Selected Sources of Electromagnetic Fields at Selected Residences in Hastings-on-Hudson*, November 23, 2013, Available: http://stopsmartmetersny.org/images/Report_on_Examination_of_Selected_Sources_of_Electromagnetic_Fields_at_Selected_Residences_20140301.pdf

Maret, K. 2012, Commentary on Questions by David M. Aaron Esq. associated with FortisBC Inc., Application for a Certificate of Public Convenience and Necessity for the Advanced Metering Infrastructure Project, ~ Project No. 3698682, By Karl H. Maret, January 23, 2012, Available: <http://www.citizensforsafetechnology.org/uploads/scribd/11%20-%20Maret%20Commentary%20on%20Questions%20by%20D.%20Aaron%20about%20FortisBC%20AMI%20application%201-23-2013.pdf>

Planning and Environment Court of Queensland 2002, *Energex Ltd v Logan City Council & Ors* [2002] QPEC 001, Available: <http://archive.sclqld.org.au/qjjudgment/2002/QPEC02-001.pdf>

World Health Organization (n.d.) a, *What are electromagnetic fields?*, Definitions and sources, Available: <http://www.who.int/peh-emf/about/WhatisEMF/en/>

World Health Organization (n.d.) b, *What are electromagnetic fields?*, Summary of Health Effects, Available: <http://www.who.int/peh-emf/about/WhatisEMF/en/index1.html>

World Health Organization 2007, *Electromagnetic fields and public health*, Exposure to extremely low frequency fields, Backgrounder, June 2007, Potential long-term effects, Available: <http://www.who.int/peh-emf/publications/facts/fs322/en/>

World Health Organization, IARC 2002, IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 80, *Non-Ionizing Radiation, Part 1: Static And Extremely Low-Frequency (ELF) Electric And Magnetic Fields*, IARC Press, Available: <http://monographs.iarc.fr/ENG/Monographs/vol80/mono80.pdf>