

Frequently Asked Questions

Electromagnetic Energy (EME)

Issue Date: 15 August 2017

What is electromagnetic energy?

Electromagnetic energy (EME) is the energy stored in an electromagnetic field. It may also be known as electromagnetic radiation (EMR) or Electromagnetic Fields (EMF). EME are present everywhere in our environment but are invisible to the naked eye. They may be naturally occurring, such as those in the earth's magnetic field which causes compasses to orientate North-South, or they may be man-made eg via electrical appliances.

The electromagnetic spectrum is the term used for all forms of EME collectively, refer to Figure 1.

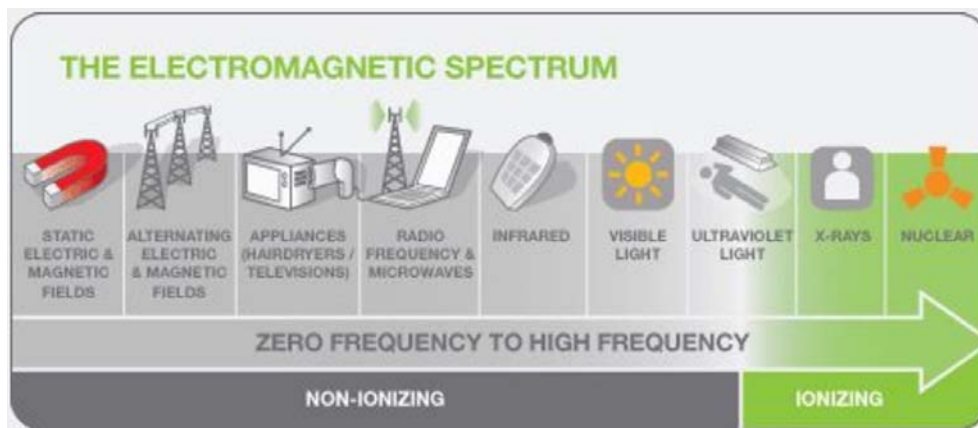


Figure 1: Electromagnetic Spectrum

Source: <http://www.emfexplained.info>

What are the different types of electromagnetic radiation?

The word 'radiation' often brings to mind unsettling thoughts of radioactive materials, or x-ray machines. Key to understanding the properties of EME, is understanding the variations caused by wavelength or frequency. EME from different parts of the spectrum interacts with matter differently, and as such the differing categorises of energy effects the human body in very different ways.

As the above Figure shows, EME can be categorised as either ionising or non-ionising. Ionising radiation are energy levels that can disrupt matter at a molecular level. Ionising radiation has higher energy (shorter wavelength) relative to non-ionising, for example UV rays, X-rays, or gamma rays from radioactive material. Non-ionising radiation on the other hand, has much lower energy levels (longer wavelengths) that are insufficient to break molecular bonds, for example visible light, radio, television or mobile phone communications.

What are potential sources of electromagnetic radiation?

Sources of electromagnetic radiation are all around us, both naturally occurring and manmade. A wide range of technologies (as shown in Figure 1) have been harnessed from the electromagnetic spectrum including electrical power, television, radio communications, mobile phones, microwave ovens, satellites, magnetic resonance imaging and X-ray machines.

Many sources of EME that we encounter during our daily lives are non-ionising, these can be further sub-categorised under the following terms: extremely low frequency (ELF) or radiofrequency (RF). Examples of extremely low frequency include high voltage power lines, cabling, electrical appliances such as computers, printers etc. Examples of radiofrequency include television, AM & FM radio broadcasts, mobile phones and associated base stations, wi-fi, emergency services communications, air traffic control, microwaves. Please refer to Figure 2.

Frequently Asked Questions

Electromagnetic Energy (EME)

Issue Date: 15 August 2017

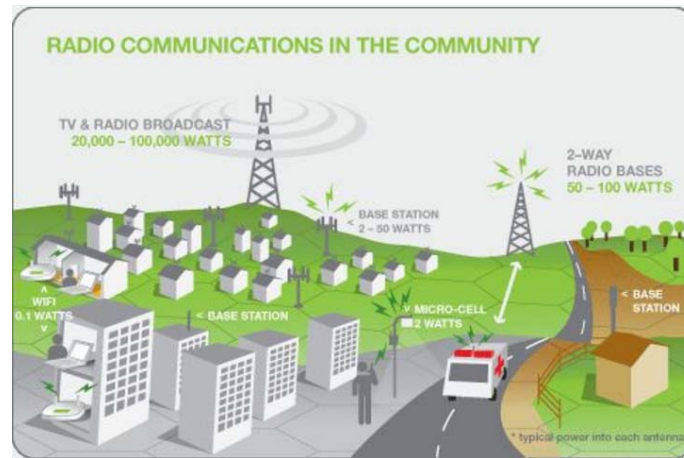


Figure 2: Radio Communications in the Community

Source: <http://www.emfexplained.info>

Why do we need electromagnetic radiation?

Modern society requires reliable and easy connection to electrical power supply, as well as sources of communication. Mobile phone technology is now integral to the way we conduct our business both at work and home. The ability to keep in touch on the move, make video calls and watch mobile tv, none of this would be possible without the use of electromagnetic energy being harnessed in a positive manner.

A standard expectation of offices, learning and teaching spaces, CBD locations is to have good quality electrical devices, as well as coverage by mobile phone and wi-fi networks.

Should I be concerned about my potential exposure to electromagnetic radiation?

As outlined above, in modern societies we are all living and working in and around small scale sources of EME. In Australia there are strict Legislative requirements including registration and regular servicing for electromagnetic emitters, including mobile phone base stations. Current standards and guidelines are designed to protect workers who regularly perform work on or close to this equipment. These criteria have in-built safety margins, to ensure the protection of the populations working in proximity to these systems.

Safe systems of works, such as those RMIT maintains, ensure the general public cannot access areas of high electromagnetic fields. Further to this it is known that the power of electromagnetic fields significantly diminishes as one moves from the source of emission.

The World Health Organization (WHO) states *'radio and television broadcast stations have been in operation for the past 50 or more years without any adverse health consequence being established'* and with regard to wireless technology and health, the general conclusion from this is: *'Despite extensive research, to date there is no evidence to conclude that exposure to low level electromagnetic fields is harmful to human health'*.

Frequently Asked Questions

Electromagnetic Energy (EME)

Issue Date: 15 August 2017

How does RMIT manage EME?

RMIT is committed to ensuring the health safety and wellbeing of all people who enter, work or study on our campuses. To this end the safety of our students, staff, visitors and contractors is paramount at RMIT. As such we have safe system of works in place at several levels of the organisation, including HR: Health Safety & Wellbeing team, Property Services, School/College etc. This includes regularly reviews and risk assessment of our buildings, working environments and operations.

Property Services maintains a central register of Radio Frequency emitter locations on RMIT occupied facilities. RMIT safe work procedures ensure these items are registered with Australian Communications and Media Authority (ACMA), and where necessary signage and exclusion areas are in place. Property Services also maintains a permit to work process for access to roofs. This process controls swipe card/key access roofs, in an effort to ensure all persons accessing them are aware of associated hazards, including safe access, working at heights, cooling towers etc and that appropriate controls are in place prior to works.

RMIT Global Safety Model prescribes operational safety required for localised specialist activities which are managed by Schools/Colleges in consultation with their local Health Safety & Wellbeing teams. Where required, potential radiation exposure is monitored e.g. medical training or work with X-rays etc.

What does RMIT know about B108 EME in particular?

In May 2006 there were reports in the media that RMIT had closed upper levels of B108 as a result of a 'cluster' of cancer in RMIT workers located in those levels. These claims were subsequently, thoroughly investigated and no evidence of a cancer cluster was identified.

The investigations involved Worksafe, National Tertiary Education Union (NTEU), Australian Education Union (AEU) and an independent panel of experts including members of University of Melbourne, Monash University and The Alfred Hospital. The report thoroughly investigated several risk factors, including possible presence of ionising and non-ionising radiation sources, as well as environmental contaminants, such as chemicals, asbestos, radon or VOCs. None of which were identified to be at or above a level of concern.

RMIT routinely reviews risk profiles of our facilities, including several difference types of physical hazards present as part of our operational environments. From time to time, we will conduct audits and or spot monitoring events across our portfolio. Most recently in 2015, Building 108 was reassessed for radio frequency (RF) and extra-low frequency (ELF) radiation as part of a major refurbishment works. RF results were again found to be significantly below required guidelines and less than one per cent (<1%) of recommended levels for general public. ELF was well below required guidelines and found to be typical of office buildings of similar construction.

Where can I find more information on EME?

- The Australian Communications and Media Authority: <http://www.acma.gov.au> https://youtu.be/XGI_LcqtDIQ
- The Australian Radiation Protection and Nuclear Safety Agency: <https://www.arpsa.gov.au/understanding-radiation/what-is-radiation>
- EMF Explained developed by Australian Mobile Telecommunications Association (ATMA); GSM Association (GSMA) and Mobile Manufacturers Forum (MMF): <http://www.emfexplained.info/>
- The World Health Organisation: <http://www.who.int/peh-emf/about/WhatisEMF/en/index1.html>

If you have any questions or concerns contact your local Health and Safety Representative (HSR) or HR Assist on hr.assist@rmit.edu.au