



EMF – Exposure Limit Guideline in Vanuatu.

Executive Summary

The Telecommunications, Radiocommunications and Broadcasting Regulator (TRBR) is mandated by the Telecommunications Radiocommunications and Broadcasting Regulation Act of 2009 as amended (the Act) to make regulations and guidelines relating to telecommunication, radiocommunication and broadcasting industry for the purpose of compliance and in accordance with the objectives of the Act.

This Guideline was developed to establish Electromagnetic Field Radiation (EMF) exposure limits, that will gather and provide protection from possible health effects from Radio frequency sources that emit EMF radiation.

The EMF guideline will also include compliance and enforcement measures which all manufacturers, importers, suppliers and operators will have to comply with when ordering or dealing with equipment or sources that emits EMF radiation.

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DEFINITIONS

Any word, phrase or expression in this document shall, unless the context requires otherwise or it is expressly defined herein, have the same meaning as in the Act.

Act *means* the Telecommunication, Radiocommunication and Broadcasting Regulation Act of 2009 as amended by Amended.

Adverse Health Effects *means* effect causes detectable impairment of the health of the exposed Individual or his or her offspring.

Biological Effect *means* effect that may or may not result in an adverse health effect.

Direct Effect *means* direct interaction of fields with the body.

Electro Magnetic Spectrum *means*, the entire distribution of electromagnetic radiation according to frequency or wavelength.

EMF *means* Electro Magnetic Field.

EMF sources *means* any form of equipment or device that emits EMF field or radiation.

ICNIRP *means* International Commission on Non-Ionizing Radiation Protection.

Indirect Effect *means* interaction with an object at a different electric potential from the body.

Ionizing Radiation *means* a type of high energy radiation that has enough energy to remove an electron (negative particle) from an atom or molecule, causing it to become ionized.

ITU *means* International Telecom Union.

Non-Ionizing Radiation *means* electromagnetic radiation that does not have sufficient energy to ionize (remove electrons from) atoms or molecules.

Public *means* members of public who are not trained or have not been provided with necessary information or appropriate clothing to protect themselves from EMF exposure.

Public Exposure *means* exposure at a public place and is subjected to public basic restrictions and reference level.

Public Places *means* an area or space which is accessible to the public such as Parks, schools, bus stops, stadiums, and shops.

Radio Frequency (RF) *means* a frequency or band of frequencies in the range of 0-300 GHz suitable for use in telecommunications.

Reference level *means* reference level of EMF exposure which is used as a comparison to basic restrictions to ensure compliance. If the reference level is said to have exceeded the respective basic restriction that it is not in compliance.

WHO *means* World Health Organization.

INTRODUCTION

Wireless communication technology has become an indispensable part of modern society. The use of mobile phones, tablets and wireless devices have become basic communication tools of everyday life for billions of people around the world, and common for medical applications. Base stations and telecommunications towers are continuously being erected to provide good quality wireless communications. All this wireless communication technology uses electromagnetic radiation to propagate energy in form of waves to travel through spaces.

Electric and magnetic fields are part of the electromagnetic spectrum which includes static electric and magnetic fields, radio frequency (used by telecommunication and wireless communication), Infrared radiation and visible light to X rays and gamma rays.

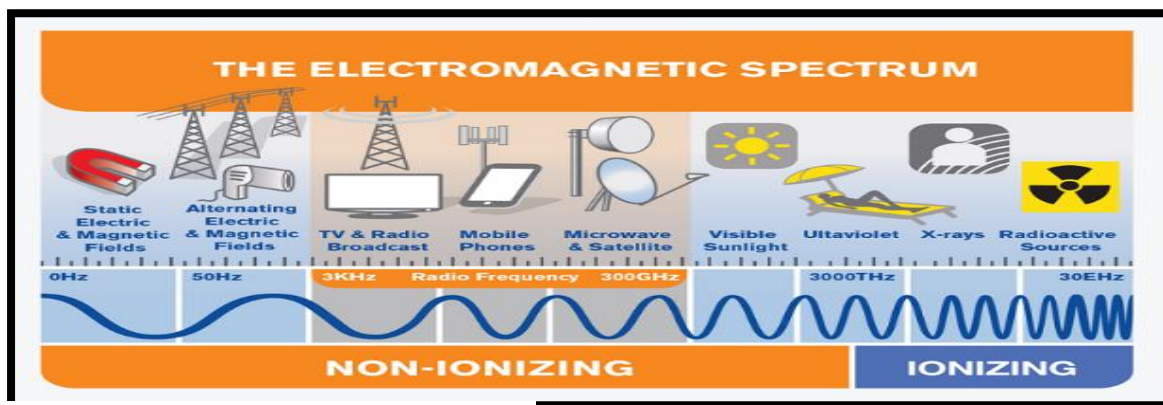


Figure 1: Electromagnetic Spectrum

Radio frequency is part of the electromagnetic spectrum, extending from the 3 kHz frequency to 300 GHz. Equipment such as TV, Base stations, mobile phones and radars all produce some form of radio frequency fields. These frequency fields form the basis of many or all telecommunication, radio as well as television equipment that are used to transmit and broadcast information all over the world.

In the electromagnetic spectrum, the different frequency fields are categorized into non-ionizing and ionizing radiation. Non-ionizing radiation occurs at frequencies below the Ultraviolet (UV) band, this is because they lack the energy to ionize or effect any change in the structure in atomic structure. Non-ionizing radiation emits low radiation and does not have the capacity to change a human molecular structure, therefore cannot cause any health side effects such as cancer. Radio Frequency fields are categorized under non-ionizing radiation.

Ionizing radiation are frequencies above the UV band, this is because they have enough energy to effect changes in atoms thus changing their chemical bonds. Ionizing radiation occurs at frequencies above 2900THz, and wavelengths of about 103.4nm, which lies near the lower wavelength of the UV spectrum. X-rays and gamma rays are common forms of ionizing radiation, ionizing radiation emits high energy radiation that have the ability to change the cell structures on any humans, thus may often result in cancer if prolonged exposure to ionizing radiation.

The advent of wireless communication has sparked concerns regarding potential health risks associated with mobile phones, radiation from base stations, and community proximity to such stations. In

Vanuatu, consumer apprehensions regarding electromagnetic field (EMF) radiation have led certain communities to consider imposing restrictions on Telco Operators from installing base stations. Despite TRBR's efforts to raise awareness nationwide about EMF radiation effects, concerns persist. Consequently, TRBR has developing this guideline specifically addressing Electromagnetic Field Radiation to address these fears and ensure public safety.

SCOPE.

This EMF guideline covers:

- EMF radiation from the Radio Frequency range 0-300 GHz (Frequency used for Telecommunication and Broadcasting).
- Public and Worker's exposure to the EMF field and radiation in the Radio frequency range.
- Wide range of the EMF sources, not centric on any technology or services, but the guideline is intended to cover all EMF radiation for various sources such as Mobile phones, Wireless devices, Base stations, Satellite systems, Back haul form Microwave, Radio and TV Antenna.

OBJECTIVES

The objective of the guideline is:

- To protect the public and workers from possible adverse health effects arising from exposure to EMF field in their working and living environment.
- To protect the public and workers from possible biological health effects arising from exposure to EMF field in their working and living environment.
- To protect the public and workers from direct and indirect effects of EMF.
- Make people aware through the use and distribution of this guideline with the purpose of educating the public about the real dangers of EMF exposures and the approved exposure limits based on scientifically proven information from approved and recognized sources like WHO, ITU and others.
- To establish safe limits of EMF exposure levels that personal dealing and installing devices, or equipment of EMF should comply with during operation and installing of such devices.

EMF EXPOSURE LIMITS & COMPLIANCE PROCEDURES

EMF Exposure Limits

TRBR will be using the recommendation by the International Commission on Non-Ionizing Radiation Protection and reference levels (ICNIRP), that will be adopted as the applicable exposure limits.

There are two (2) types of exposure limits

- Basic Restrictions
- Reference Levels

Basic Restrictions

Basic Restrictions is the term given to mandatory limits on exposure to RF fields and are based on substantiated health effects. To ensure that the protection against substantiated adverse health effects, it requires that these restrictions are not exceeded. The physical quantities used to specify the basic restrictions are **induced electric field (E_{ind})**, **Specific energy Absorption Rate (SAR)**, **absorbed power density (S_{ab})**, **specific energy absorption (SA)** and **absorbed energy density (U_{ab})**.

The mandatory basic restrictions are often impractical to measure, since they are specified quantities. As a result, more practical reference levels are used to measure the utilizing quantities and are provided as an alternative means of showing compliance with the mandatory basic restrictions. The relevant reference level quantities are **incident electric field strength (E_{inc})**, **incident magnetic field strength (H_{inc})**, **incident power density (S_{inc})**, **plane-wave equivalent incident power density (S_{eq})**, **incident energy density (U_{inc})**, and **plane-wave equivalent incident energy density (U_{eq})**, all measured outside the body, and **electric current** inside the body (I). To be compliant with the present standard, for each exposure quantity (e.g., E-field, H-field, SAR), and temporal and spatial averaging condition, either the basic restriction or corresponding reference level must be adhered to; compliance with both is not required.

The basic restrictions are specified in the following Table 1 and Table 2, A description of their derivation is provided in the ICNIRP guidelines (2020).

Different criteria were used in the development of basic restrictions for various frequency ranges:

- Between 100 kHz and 10 MHz, basic restrictions on E_{ind} are provided to prevent electrostimulation of excitable tissue (see Table 3).
- Between 100 kHz and 300 GHz, basic restrictions on whole body average SAR are provided to prevent whole-body heat stress (see Table 1).
- Between 100 kHz and 6 GHz, basic restrictions on local SAR (head/torso and limbs) are provided to prevent excessive localized temperature rise in tissue (see Table 1).
- Between 400 MHz and 6 GHz, basic restrictions on local SA are provided to prevent rapid temperature elevation (see Table 2).
- Between 6 GHz and 300 GHz, basic restrictions on local S_{ab} are provided to prevent excessive heating in tissue at or near the body surface (see Table 1).
- Between 6 GHz and 300 GHz, basic restrictions on local U_{ab} are provided to prevent rapid temperature elevation (see Table 2).

Scenario Exposure	Frequency Range	Whole Body Average SAR (W kg ⁻¹)	Local Head/Torso SAR (W kg ⁻¹)	Local Limb SAR (W kg ⁻¹)	Local S _{ab} (W m ⁻²)
Occupational	100 kHz – 6 GHz	0.4	10	20	NA
	>6 GHz – 300 GHz	0.4	NA	NA	100
General Public	100 kHz – 6 GHz	0.08	2	4	NA
	>6 GHz – 300 GHz	0.08	NA	NA	20

Table 1: Basic restrictions for RF electromagnetic field exposure from 100 kHz to 300 GHz, for averaging intervals. ≥ 6 minutes.

Notes:

1. 'NA' signifies 'not applicable' and does not need to be taken into account when determining compliance.
2. Whole body average SAR is to be averaged over 30 minutes.
3. Local SAR and S_{ab} exposures are to be averaged over 6 minutes.
4. Local SAR is to be averaged over a 10 g cubic mass.
5. Local S_{ab} is to be averaged over a square 4-cm² surface area of the body. Above 30 GHz, an additional constraint is imposed, such that exposure averaged over a square 1-cm² surface area of the body is restricted to two times that of the S_{ab} restriction.

Exposure Scenario	Frequency Range	Local Head/Torso SA (kJ kg ⁻¹)	Local Limb SA (kJ kg ⁻¹)	Local U _{ab} (kJ m ⁻²)
Occupational	100 kHz – 400 MHz	NA	NA	NA
	>400 MHz – 6 GHz	3.6(0.05+0.95[t/360] ^{0.5})	7.2(0.025+0.975[t/360] ^{0.5})	NA
	>6 GHz – 300 GHz	NA	NA	36(0.05+0.95[t/360] ^{0.5})
General Public	100 kHz – 400 MHz	NA	NA	NA
	>400 MHz – 6 GHz	0.72(0.05+0.95[t/360] ^{0.5})	1.44(0.025+0.975[t/360] ^{0.5})	NA
	>6 GHz – 300 GHz	NA	NA	7.2(0.05+0.95[t/360] ^{0.5})

Table 2: Basic restrictions for RF electromagnetic field exposure from 100 kHz to 300 GHz, for integrating interval > 0 to < 6 minutes.

Notes:

1. 'NA' signifies 'not applicable' and does not need to be taken into account when determining compliance.
2. *t* is the exposure time in seconds, and restrictions must be satisfied for all values of *t* between >0 and <360 seconds, regardless of the temporal characteristics of the exposure itself.
3. Local SA is to be averaged over a 10-g cubic mass.
4. Local U_{ab} is to be averaged over a square 4-cm² surface area of the body. Above 30 GHz, an additional constraint is imposed, such that exposure averaged over a square 1-cm² surface area of the body is restricted to 72(0.025+0.975(*t*/360)^{0.5}) for occupational and 14.4(0.025+0.975(*t*/360)^{0.5}) for general public exposure.
5. Exposure from any pulse, group of pulses, or subgroup of pulses in a train, as well as from the summation of exposures (including non-pulsed electromagnetic fields), delivered in *t* seconds, must not exceed these levels.

Exposure Scenario	Frequency Range	Induced Electric Field E _{ind} (V m ⁻¹)
Occupational	100 kHz – 10 MHz	2.70x10 ⁻⁴ <i>f</i>
General Public	100 kHz – 10 MHz	1.35x10 ⁻⁴ <i>f</i>

Table 3: Basic restrictions for RF electromagnetic field exposure from 100 kHz to 10MHz, for peak spatial values.

Notes:

1. f is frequency in Hz.
2. Restriction values relate to any region of the body and are to be averaged as root mean square (rms) values over $2\text{ mm} \times 2\text{ mm} \times 2\text{ mm}$ contiguous tissue (as specified in ICNIRP (2010)).

Reference Levels

Reference levels are acquired from a combination of computational techniques and experimental measurements to provide a means of demonstrating compliance using quantities that are more-easily assessed compared to basic restrictions to determine whether the basic restrictions are likely to be exceeded. However, as the derivations rely on conservative assumptions, in most exposure scenarios the reference levels will be more conservative than the corresponding basic restrictions. Further detail regarding the reference levels is provided in the ICNIRP guidelines (2020a).

The reference levels are specified in Tables 4-8 and have been set to protect against effects associated with:

- Whole body exposure (averaged over 30 minutes; Table 4)
- Local exposure (averaged over 6 minutes; Table 5)
- Brief local exposure (integrated over intervals between >0 and <6 minutes; Table 6); and
- Instantaneous local exposure (peak instantaneous field strength; Table 7)

Tables 4 to 8 specify averaging and integrating times of the relevant exposure quantities to determine whether personal exposure level is compliant with the Standard. These averaging and integrating times are continuous periods. They are not necessarily the same as the measurement times needed to estimate field strengths or other exposure quantities. Actual measurement times used to provide an appropriate estimate of exposure quantities may be shorter than the intervals specified in these tables when the field is substantially constant, or when known characteristics can be used to calculate the average.

Tables 4-7 specify requirements for demonstrating compliance in the far field, radiating near field and reactive near field. The boundaries between these regions depend on several factors, including the antenna type, antenna dimensions and wavelength of the RF electromagnetic field. Users should consult appropriate exposure assessment standards, such as current editions of [AS/NZS 2772.2](#) and [IEC 62232](#) for further details and definition of the boundaries for specific circumstances.

Exposure Scenario	Frequency Range	Incident E-field Strength E_{inc} ($V m^{-1}$)	Incident H-field Strength H_{inc} ($A m^{-1}$)	Incident Power Density S_{inc} ($W m^{-2}$)
Occupational	0.1-6.943 MHz	ES	$4.9/f_M$	NA
	>6.943-30 MHz	$660/f_M^{0.7}$	$4.9/f_M$	NA
	>30-400 MHz	61	0.16	10
	>400-2000 MHz	$3f_M^{0.5}$	$0.008f_M^{0.5}$	$f_M/40$
	>2-300 GHz	NA	NA	50
General Public	0.1 – 6.27 MHz	ES	$2.2/f_M$	NA
	>6.27-30 MHz	$300/f_M^{0.7}$	$2.2/f_M$	NA
	>30-400 MHz	27.7	0.073	2
	>400-2000 MHz	$1.375f_M^{0.5}$	$0.0037f_M^{0.5}$	$f_M/200$
	>2-300 GHz	NA	NA	10

Table 4: Reference levels for whole body exposure, averaged over 30 minutes, to RF electromagnetic fields from 100 kHz to 300 GHz (unperturbed rms values.

Notes:

1. 'NA' signifies 'not applicable' and does not need to be taken into account when determining compliance.
2. 'ES' signifies that no reference level is available, as it would be greater than the reference level for spatial peak and temporal peak field strengths based on electrostimulation effects shown in Table 7.
3. f_M is frequency in MHz.
4. S_{inc} , E_{inc} and H_{inc} are to be averaged over 30 minutes, over the whole-body space. Temporal and spatial averaging of each of E_{inc} and H_{inc} must be conducted by averaging over the relevant square values (see ICNIRP 2020a for details).
5. For frequencies of 100 kHz to 30 MHz, regardless of the far-field/near-field zone distinctions, compliance is demonstrated if neither E_{inc} nor H_{inc} exceeds the above reference level values.
6. For frequencies of >30 MHz to 2 GHz: a) within the far-field and radiating near field zones: compliance is demonstrated if either S_{inc} , E_{inc} or H_{inc} , does not exceed the above reference level values (only one is required); S_{eq} derived from either E_{inc} or H_{inc} may be substituted for S_{inc} ; b) within the reactive near-field zone: compliance is demonstrated if both E_{inc} and H_{inc} do not exceed the above reference level values; S_{inc} cannot be used to demonstrate compliance, and so basic restrictions must be assessed.
7. For frequencies of >2 GHz to 300 GHz: a) within the far-field and radiating near field zones: compliance is demonstrated if S_{inc} does not exceed the above reference level values; S_{eq} derived from either E_{inc} or H_{inc} may be substituted for S_{inc} ; b) within the reactive near-field zone, reference levels cannot be used to determine compliance, and so basic restrictions must be assessed.

Exposure Scenario	Frequency Range	Incident E-field Strength E_{inc} ($V m^{-1}$)	Incident H-field Strength H_{inc} ($A m^{-1}$)	Incident Power Density S_{inc} ($W m^{-2}$)
Occupational	0.1-0.135 MHz	ES	ES	NA
	>0.135-10 MHz	ES	$10.8/f_M$	NA
	>10-30 MHz	$1504/f_M^{0.7}$	$10.8/f_M$	NA
	>30-400 MHz	139	0.36	50
	>400-2,000 MHz	$10.58f_M^{0.43}$	$0.0274f_M^{0.43}$	$0.29f_M^{0.86}$
	>2 – 6 GHz	NA	NA	200
	>6 – <300 GHz	NA	NA	$275/f_G^{0.177}$
	300 GHz	NA	NA	100
General Public	0.1-0.233 MHz	ES	ES	NA
	>0.233-10 MHz	ES	$4.9/f_M$	NA
	>10-30 MHz	$671/f_M^{0.7}$	$4.9/f_M$	NA
	>30-400 MHz	62	0.163	10
	>400-2,000 MHz	$4.72f_M^{0.43}$	$0.0123f_M^{0.43}$	$0.058f_M^{0.86}$
	>2 – 6 GHz	NA	NA	40
	>6 – <300 GHz	NA	NA	$55/f_G^{0.177}$
	300 GHz	NA	NA	20

Table 5: Reference levels for local exposure, averaged over 6 minutes, to RF electromagnetic fields from 100 kHz to 300 GHz (unperturbed rms values.

Notes:

1. 'NA' signifies 'not applicable' and does not need to be taken into account when determining compliance.
2. 'ES' signifies that no reference level is available, as it would be greater than the reference level for spatial peak and temporal peak field strengths based on electrostimulation effects shown in Table 7.
3. f_M is frequency in MHz; f_G is frequency in GHz.
4. S_{inc} , E_{inc} and H_{inc} are to be averaged over 6 minutes, and where spatial averaging is specified in Notes 6-8, over the relevant projected body space. Temporal and spatial averaging of each of E_{inc} and H_{inc} must be conducted by averaging over the relevant square values (see ICNIRP 2020a for details).
5. For frequencies of 100 kHz to 30 MHz, regardless of the far-field/near-field zone distinctions, compliance is demonstrated if neither peak spatial E_{inc} nor peak spatial H_{inc} , over the projected whole-body space, exceeds the above reference level values.

6. For frequencies of >30 MHz to 6 GHz: a) within the far-field and radiating near field zones, compliance is demonstrated if one of peak spatial S_{inc} , E_{inc} or H_{inc} , over the projected whole-body space, does not exceed the above reference level values (only one is required); S_{eq} derived from either E_{inc} or H_{inc} may be substituted for S_{inc} ; b) within the reactive near-field zone: compliance is demonstrated if both peak spatial E_{inc} and H_{inc} do not exceed the above reference level values; S_{inc} cannot be used to demonstrate compliance; for frequencies >2 GHz, reference levels cannot be used to determine compliance, and so basic restrictions must be assessed.
7. For frequencies of >6 GHz to 300 GHz: a) within the far-field and radiating near field zones, compliance is demonstrated if S_{inc} , averaged over a square 4-cm² projected body surface space, does not exceed the above reference level values; S_{eq} derived from either E_{inc} or H_{inc} may be substituted for S_{inc} ; b) within the reactive near-field zone, reference levels cannot be used to determine compliance, and so basic restrictions must be assessed.
8. For frequencies of >30 GHz to 300 GHz, exposure averaged over a square 1-cm² projected body surface space must not exceed twice that of the square 4-cm² S_{inc} restrictions.

Exposure Scenario	Frequency Range	Incident Energy Density U_{inc} (kJ m ⁻²)
Occupational	100 kHz – 400 MHz	NA
	>400 – 2000 MHz	$0.29f_M^{0.86} \times 0.36(0.05+0.95[t/360]^{0.5})$
	>2 – 6 GHz	$200 \times 0.36(0.05+0.95[t/360]^{0.5})$
	>6 – <300 GHz	$275/f_G^{0.177} \times 0.36(0.05+0.95[t/360]^{0.5})$
	300 GHz	$100 \times 0.36(0.05+0.95[t/360]^{0.5})$
General Public	100 kHz – 400 MHz	NA
	>400 – 2000 MHz	$0.058f_M^{0.86} \times 0.36(0.05+0.95[t/360]^{0.5})$
	>2 – 6 GHz	$40 \times 0.36(0.05+0.95[t/360]^{0.5})$
	>6 – <300 GHz	$55/f_G^{0.177} \times 0.36(0.05+0.95[t/360]^{0.5})$
	300 GHz	$20 \times 0.36(0.05+0.95[t/360]^{0.5})$

Table 6: Reference levels for local exposure, integrated over intervals of between >0 and <6 minutes, to RF electromagnetic fields from 100 kHz to 300 GHz (unperturbed rms values).

Notes:

1. 'NA' signifies 'not applicable' and does not need to be taken into account when determining compliance.
2. f_M is frequency in MHz; f_G is frequency in GHz; t is the exposure time interval in seconds, such that exposure from any pulse, group of pulses, or subgroup of pulses in a train, as well as from the summation of exposures (including non-pulsed RF electromagnetic fields), delivered in t seconds, must not exceed these reference level values for any time $0 < t < 360$ s.
3. U_{inc} is to be calculated over time t , and where spatial averaging is specified in Notes 5-7, over the relevant projected body space.

4. For frequencies of 100 kHz to 400 MHz, >0 to <6-minute restrictions are not required and so reference levels have not been set.
5. For frequencies of >400 MHz to 6 GHz: a) within the far-field and radiating near field zones: compliance is demonstrated if peak spatial U_{inc} , over the projected whole-body space, does not exceed the above reference level values; U_{eq} derived from either E_{inc} or H_{inc} may be substituted for U_{inc} ; b) within the reactive near-field zone, reference levels cannot be used to determine compliance, and so basic restrictions must be assessed.
6. For frequencies of >6 GHz to 300 GHz: a) within the far-field or radiative near-field zone, compliance is demonstrated if U_{inc} , averaged over a square 4-cm² projected body surface space, does not exceed the above reference level values; U_{eq} derived from either E_{inc} or H_{inc} may be substituted for U_{inc} ; b) within the reactive near-field zone, reference levels cannot be used to determine compliance, and so basic restrictions must be assessed.
7. For frequencies of >30 GHz to 300 GHz: exposure averaged over a square 1-cm² projected body surface space must not exceed $275/f_G^{0.177} \times 0.72(0.025+0.975[t/360]^{0.5})$ kJ m⁻² for occupational and $55/f_G^{0.177} \times 0.72(0.025+0.975[t/360]^{0.5})$ kJ m⁻² for general public exposure.

Exposure Scenario	Frequency Range	Incident E-field Strength E_{inc} ($V\ m^{-1}$)	Incident H-field Strength H_{inc} ($A\ m^{-1}$)
Occupational	100 kHz – 10 MHz	170	80
General Public	100 kHz – 10 MHz	83	21

Table 7: Reference levels for spatial peak and temporal peak field strength, to RF electromagnetic fields from 100 kHz to 10 MHz (unperturbed RMS values).

Notes:

1. Regardless of the far-field/near-field zone distinction, compliance is demonstrated if neither the temporal nor spatial peak E_{inc} or H_{inc} , over the space occupied by the body, exceeds the above reference level values.

Exposure Scenario	Frequency Range	Current I (mA)
Occupational	100 kHz – 110 MHz	100
General Public	100 kHz – 110 MHz	45

Table 8: Reference levels for current induced in any limb, averaged over 6 minutes, at frequencies between 100 kHz and 110 MHz.

Notes:

1. Current intensity values must be determined by averaging over the relevant square values (see ICNIRP 2020a for details).
2. Limb current intensity must be evaluated separately for each limb.
3. Limb current reference levels are not provided for any other frequency range.
4. Limb current reference levels are only required for cases where the human body is not electrically isolated from a ground plane.

Compliance

Public Exposure

All operators or anyone using or are owners of EMF emitting equipment or sources are to ensure that EMF exposure must not exceed the reference levels set in this guideline

In any situation where the Reference level has or is exceeded, an evaluation is needed to determine whether the basic restrictions have been exceeded.

If it is determined that the exposure levels are within the Basic Restrictions, the site is said to have complied and meet the required standards.

If it is determined that the Basic Restrictions levels are exceed, the site has not complied and subject to enforcement measures

Occupational Exposure

Occupational exposure is the potential exposure to EMF of workers above the public exposure limits in a workplace. These workers include:

- A person who may be occupationally exposed to RF fields in the course of and nature of their work
- A person who is appropriately¹ trained to use two-way radios, portable wireless devices and other devices that emits EMF, which expose the user to levels likely to exceed the basic restrictions for general public.
- A Person or Persons who are appropriately trained includes but not limited to
 - Emergency service personnel
 - Amateur radio personnel
 - Voluntary civil defence personnel
 - Military personnel
- A Person working in Public Areas
- Pregnant women whom their pregnancy has been declared to their employer
- A Person with no appropriate training regarding workplace procedure that allow them to work in areas where exposures can exceed those permitted by Public

Reporting and Measurements

The TRBR will from time to time carryout measurements and EMF exposure test on sites, public areas and /or workplaces to ensure the level of EMF exposure limits complies with the limit requirements as set out in this guideline

The TRBR may upon request from any persons from the public carryout measurement on any operator sites in the village or community to check and ensure that the level of EMF exposure limits complies with the requirements.

Any sites, workplaces or areas, which are found to be emitting higher level of EMF exposure above the set exposure limits, will be subjects to the strict enforcements as provide by this guideline.

¹ Appropriate training includes awareness of the potential for exposure and measures that can be taken to control that exposure

Enforcement

To ensure measures for the protection of the general public who may be exposed to RF fields, TRBR shall enforce the following measures

- Operators or site owners with installations within the vicinity of a Public area to ensure the EMF emissions comply with the EMF exposure limits by taking necessary steps to restrict public access and /or reduce EMF emissions from the source(s) contributing to the exposure.
- Verification of the boundaries of areas where general public exposure limits may be exceeded.
- Restriction of public access to those areas where the general public exposure limits may be exceeded.
- Appropriate provisions of signs or notices should be placed on sites or areas which emit EMF to warn public about the EMF emissions.
- Operators or Site owners must ensure that workers who are exposed to EMF at work or who are classified as trained workers, must receive or have any necessary information and training relating to their exposure and are made aware of any mitigating measures needed to comply with EMF exposure limits.

Penalty

Any Operator or site owner who intentionally violate any clause outline in this guideline will be penalized in accordance with TRBR Act.