Regulations

Permissible Non-Ionizing Radiation Limits

Version 2.0

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Article (1)

Scope of Document

1.1 These regulations are issued in accordance with the provisions of the UAE Federal Law by Decree No 3 of 2003 (Telecom Law) as amended and its Executive Order.

1.2 This document comprises technical regulations for Permissible Non-Ionizing Radiation Limits for Telecommunication Networks for various applications. It shall be read in conjunction with the following documents available from the TDRA website at www.tdra.gov.ae:

1.2.1 Guidelines on Non-Ionizing Radiation Limits.

1.2.2 Spectrum Allocation and Assignment Regulations.

1.2.3 Interference Management Regulations.

1.2.4 National Frequency Plan including National Table of Frequency Allocation.

1.2.5 Spectrum Monitoring and Enforcement Regulations.

1.2.6 Regulatory Procedures on Access public lands for the purpose of building network booster.

1.2.7 Regulatory Procedures on Access to private lands.

Article (2)
Definitions

2.1 The terms, words and phrases used in these Regulations shall have the same meaning as is ascribed to them in the UAE Federal Law by Decree No 3 of 2003 (Telecom Law) as amended and its Executive Order; unless these Regulations expressly provide otherwise for, or the context in which those terms, words and phrases are used in these Regulations indicates otherwise. The following terms and words shall be interpreted, as follows:

2.1.1 "**Authority**" or "**TDRA**" means the General Authority for Regulating the Digital Government and Telecommunication Sector known as Telecommunications and Digital Government Regulatory Authority (TDRA) established pursuant to the provisions of Federal Law by Decree No. 3 of 2003 (as amended).

2.1.2 **"Compliance Distance"** means the minimum distance from the antenna to the point of investigation where the field level is deemed to be compliant to the limits;

2.1.3 **"EMF"** means the Electro Magnetic Field which is the field of force associated with electric charge in motion. It has both electric and magnetic components and contains a definite amount of electromagnetic energy;

2.1.4 **"General-Public Individuals"** means individuals of all ages and of differing health statuses, which includes more vulnerable groups or individuals, and who may have no knowledge of or control over their exposure to EMFs.

2.1.5 **"HRP"** means the Horizontal Radiation Pattern.

2.1.6 **"ICNIRP Guidelines"** has the meaning ascribed to it in Article 3.1.

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

2.1.8 **"IMT Networks"** means International Mobile Telecommunications is the generic term used by the ITU to designate broadband mobile systems. It encompasses IMT-2000, IMT- Advanced and IMT-2020 collectively. International regulations and global standards are adopted worldwide to enable the global harmonization and implementation of different generations of broadband mobile networks (e.g. 3G, 4G, 5G, etc.).

2.1.9 **"Non-Ionizing Radiations"** refer to any type of electromagnetic radiation that does not have enough energy to completely remove an electron from an atom or molecule. Examples of Non-Ionizing radiation sources are; Mobile/phones, AM & FM Radio and Microwave;

2.1.10 **"Occupationally-exposed individuals"** Adults who are exposed under controlled conditions associated with their occupational duties, trained to be aware of potential radiofrequency EMF risks and to employ appropriate harm-mitigation measures, and who have the

sensors and behavioural capacity for such awareness and harm-mitigation response. An occupationally-exposed worker must also be subject to an appropriate health and safety program that provides the above information and protection.

2.1.11 **"Plane-wave equivalent incident power density (S_{eq})"** means the RF power per unit area, and in the far-field is equal in magnitude to the power flux-density of a plane wave having the same electric (E) or magnetic (H) field strength expressed in units of watts per square metre (W/m2).

2.1.12 **"Telecommunications Apparatus"** means apparatus made or adapted for use in transmitting, receiving or conveying any of the Telecommunications Services through a Telecommunications Network.

2.1.13 **"VRP"** means the Vertical Radiation Pattern.

2.1.14 **"Wireless Equipment"** means a category of Telecommunication Apparatus used for Radiocommunication Service.

Article (3)
Technical Conditions

3.1 EMF exposure should comply with the guidelines published by the International Commission for Non-Ionizing Radiation Protection (ICNIRP). The technical conditions as given in this Regulations shall apply on the Non-Ionizing Radiation Limits. The limits specified in the guidelines published by the most recent version of the ICNIRP Guidelines (issued in 2020 and amended in the future) shall be adhered to. By way of example only, the following tables (which are extracted from the ICNIRP (2020)) illustrates the levels of exposure for the general public to Non-Ionizing radiations which the ICNIRP Guidelines for Limiting Exposure to Electromagnetic Fields (100 KHz to 300 GHz) regards as acceptable:

Type of exposure	Frequency range	Electric field strength; E_{inc} (V/m)	Magnetic field strength; H_{inc} (A/m)	Plane-wave equivalent incident power density S_{inc} (W/m2)
Occupational	0.1-30MHz	$660/f_M^{0.7}$	$4.9/f_M$	NA
	>30-400 MHz	61	0.16	10
	>400-2000 MHz	$3f_M^{1/2}$	$0.008f_M^{1/2}$	$f_M/40$
	>2-300 GHz	NA	NA	50
General Public	0.1-30MHz	$300/f_M^{0.7}$	$2.2/f_M$	NA
	>30-400 MHz	27.7	0.073	2
	>400-2000 MHz	$1.375f_M^{1/2}$	$0.0037f_M^{1/2}$	$f_M/200$
	>2-300 GHz	NA	NA	10

ICNIRP Reference levels averaged over 30 min and the whole body, to electromagnetic fields from 100 kHz to 300 GHz (unperturbed rms values)

Note:

1. NA signifies "not applicable" and does not need to be taken into account when determining compliance.

2. ƒM is frequency in MHz.

3. Sinc, Einc, and Hinc are to be averaged over 30 min, over the whole-body space. Temporal and spatial averaging of each of Einc and Hinc must be conducted by averaging over the relevant square values (see eqn 8 in Appendix A of ICNIRP (2020) for details).

4. For frequencies of >30MHz to 2 GHz: (a) within the far-field zone: compliance is demonstrated if either Sinc, Einc or Hinc, does not exceed the above reference level values (only one is required); Seq may be substituted for Sinc; (b) within the radiative near-field zone, compliance is demonstrated if either Sinc, or both Einc and Hinc, does not exceed the above reference level values; and (c) within the reactive near-field zone: compliance is demonstrated if both Einc and Hinc do not exceed the above reference level values; Sinc cannot be used to demonstrate compliance, and so basic restrictions must be assessed.

5. For frequencies of >2 GHz to 300 GHz: (a) within the far-field zone: compliance is demonstrated if Sinc does not exceed the above reference level values; Seq may be substituted for Sinc; (b) within the radiative near-field zone, compliance is demonstrated if Sinc does not exceed the above reference level values; and (c) within the reactive near-field zone, reference levels cannot be used to determine compliance, and so basic restrictions must be assessed.

Type of exposure	Frequency range	Electric fie ld strength E_{inc}(V/m)	Magnetic field strength H_{inc}(A/m)	Plane-wave equivalent incident power density S_{inc} (W/m2).
Occupational	0.1-30MHz	1504/fM0.7	$10.8/f_M$	NA
	>30-400 MHz	139	0.36	50
	>400-2000 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	0.1-30MHz	$671/f_M^{0.7}$	$4.9/f_M$	NA
	>30-400 MHz	62	0.163	10
	>400-2000 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

ICNIRP Reference levels averaged over 6 min, to electromagnetic fields from 100 kHz to 300 GHz (unperturbed rms values)
Note:

1. "NA" signifies "not applicable" and does not need to be taken into account when determining compliance.
2. fM is frequency in MHz; fG is frequency in GHz.
3. Sinc, Einc, and Hinc are to be averaged over 6 min, and where spatial averaging is specified in Notes 6–7, over the relevant projected body space. Temporal and spatial averaging of each of Einc and Hinc must be conducted by averaging over the relevant square values (see eqn 8 in Appendix A of ICNIRP (2020) for details).
5. For frequencies of >30MHz to 6 GHz: (a) within the far-field zone, compliance is demonstrated if one of peak spatial Sinc, Einc or Hinc, over the projected whole-body space, does not exceed the above reference level values (only one is required); Seq may be substituted for Sinc; (b) within the radiative near-field zone, compliance is demonstrated if either peak spatial Sinc, or both peak spatial Einc and Hinc, over the projected whole-body space, does not exceed the above reference level values; and (c) within the reactive near-field zone: compliance is demonstrated if both Einc and Hinc do not exceed the above reference level values; Sinc 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.
6. For frequencies of >6 GHz to 300 GHz: (a) within the far-field zone, compliance is demonstrated if Sinc, averaged over a square 4-cm2 projected body surface space, does not exceed the above reference level values; Seq may be substituted for Sinc; (b) within the radiative near-field zone, compliance is demonstrated if Sinc, averaged over a square 4-cm2 projected body surface space, does not exceed the above reference level values; and (c) 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 twice that of the square 4-cm2 restriction

Note: Applicable basic restrictions may be found in Table 2 of ICNIRP (2020) Guidelines for Limiting Exposure to Electromagnetic Fields (100 kHz to 300 GHz)

Article (4)
NIRL Guidelines

4.1 NIRL requirements for electromagnetic spectrum specified in these Regulations are outlined in the Guidelines for Exposure Limits for Non-Ionizing Radiation (100 kHz to 300 GHz).

4.2 Guidelines on Exposure Limits for Non-Ionizing Radiation (100 kHz to 300 GHz) comprises the required compliance procedures on Licensees, conducting audits by the Authority and methodology of obtaining relevant information.