



Suruhanjaya Komunikasi dan Multimedia Malaysia
Malaysian Communications and Multimedia Commission

COMMUNICATIONS AND MULTIMEDIA ACT 1998

**COMMISSION DETERMINATION ON THE MANDATORY STANDARD FOR ELECTROMAGNETIC
FIELD EMISSION FROM RADIOCOMMUNICATIONS INFRASTRUCTURE**

DETERMINATION NO. 5 OF 2021

Pursuant to the Ministerial Direction on the Standard for Electromagnetic Field Emission from Radiocommunications Infrastructure, Direction No. 7 of 2010 and in exercise of the powers conferred by sections 55, 56, 104(2) and 106 of the Communications and Multimedia Act 1998 [Act 588] ("Act"), the Commission hereby determines as follows:

Citation and Commencement

1. This determination may be cited as the **Commission Determination on the Mandatory Standard for Electromagnetic Field Emission from Radiocommunications Infrastructure, Determination No. 5 of 2021**.
2. This Determination shall come into operation on 1 November 2021.

Definitions and Interpretation

3. For the purpose of this Determination, unless the context otherwise requires,
 - (a) any terms used in this Determination shall have the same meaning as in the Act or the subsidiary legislations made under it;
 - (b) words in the singular include the plural and vice versa;
 - (c) the following terms used in this Determination shall have the stated meaning:

"EMF" means radiofrequency electromagnetic fields, being the part of the electromagnetic spectrum comprising the frequency range from 100 kHz to 300 GHz;

"EMF Compliance Assessment" means assessment of EMF compliance as referred to in paragraphs 10 to 13 of this Determination;

"EMF Compliance Declaration" means the declaration of compliance of a site with the EMF Exposure Limit specified in Table 1, as referred to in paragraph 9 of this Determination;

“EMF Compliance Report” means the report in respect of the EMF compliance as referred to in paragraphs 14 and 15 of this Determination;

“EMF Trained Personnel” means a person who may be occupationally exposed to EMF at work and has received necessary information and training relating to the said exposure and made aware of any mitigation measures needed to comply with the EMF exposure limits and trained to employ the appropriate mitigation measures;

“General Public” 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 EMF;

“RCI” means radiocommunications infrastructures, whereby:

“Complex RCI” means radiocommunications infrastructures with two (2) or more transmitter in a single sector; and

“Single RCI” means radiocommunications infrastructures with a single transmitter [including three (3) sectors/panels antennas for coverage in all directions];

“RF Owner” means a party responsible for EMF related works as described in paragraph 19 of this Determination;

“Service Providers” means all network facilities providers and network service providers operating RCI which emit EMF for the purpose of communications; and

“Shared Sites” means multiple services or systems on the same or different radiocommunications infrastructure within a particular location.

Licensees Subject to the Determination

4. The Service Providers shall be subject to this Determination. The RCI shall include base stations transmitters, repeaters and broadcast transmitters.

Standard for EMF from RCI

EMF Exposure Limits

5. The limit of EMF exposure from a RCI site for occupational workers and the General Public shall not exceed any one of the parameters in Table 1 below:

**Table 1: Reference levels for exposure from 100 kHz to 300 GHz
[unperturbed root means square (rms) values]**

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 MHz - 30 MHz	$660/f_M^{0.7}$	$4.9/f_M$	N/A
	> 30 MHz - 400 MHz	61	0.16	10
	> 400 MHz - 2000 MHz	$3f_M^{0.5}$	$0.008\ f_M^{0.5}$	$f_M/40$
	> 2 GHz - 300 GHz	N/A	N/A	50
General Public	0.1 MHz - 30 MHz	$300/f_M^{0.7}$	$2.2/f_M$	N/A
	> 30 MHz - 400 MHz	27.7	0.073	2
	> 400 MHz - 2000 MHz	$1.375\ f_M^{0.5}$	$0.0037\ f_M^{0.5}$	$f_M/200$
	> 2 GHz - 300 GHz	N/A	N/A	10

NOTES:

1. N/A signifies not applicable and does not need to be taken into account when determining compliance.
2. f_M is frequency in MHz.
3. 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.
4. For frequencies of 100 kHz to 30 MHz, regardless of the Far Field ("FF")/Near Field ("NF") zone distinctions, compliance is demonstrated if neither E_{inc} and H_{inc} exceeds the above reference level values.
5. For frequencies of > 30 MHz to 2 GHz:
 - (a) within the FF zone: 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} may be substituted for S_{inc} ;
 - (b) within the radiative NF zone, compliance is demonstrated if either S_{inc} , or both E_{inc} and H_{inc} , does not exceed the above reference level values; and
 - (c) within the reactive NF 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.
6. For frequencies of > 2 GHz to 300 GHz:
 - (a) within the FF zone: compliance is demonstrated if S_{inc} does not exceed the above reference level values; S_{eq} may be substituted for S_{inc} ;
 - (b) within the radiative NF zone, compliance is demonstrated if S_{inc} does not exceed the above reference level values; and
 - (c) within the reactive NF zone, reference levels cannot be used to determine compliance, and so basic restrictions must be assessed.

[Source: ICNIRP Guidelines for Limiting Exposure to Electromagnetic Fields (100 kHz to 300 GHz), 2020]

Compliance Procedures

6. The EMF Compliance Assessment shall be required for the followings:
 - (a) transmitters with an Effective Isotropic Radiated Power ("EIRP") greater than 10 Watt (W); and
 - (b) transmitters with an EIRP above 2 W but not greater or equal to 10 W that is installed at below the height of 2.2 meters from public walkway.
7. The EMF Compliance Assessment is not required for transmitters with an EIRP above 2 W but not greater or equal to 10 W that is installed at a minimum height of 2.2 meters from public walkway, and no further action is deemed necessary.
8. Transmitters with a maximum EIRP of 2 W or less are classified as inherently compliant and no further action is deemed necessary.

EMF Compliance Declaration

9. The Service Providers are required to make an EMF Compliance Declaration which shall be based on the EMF Compliance Assessment and the EMF Compliance Report. The EMF Compliance Declaration shall be valid up to five (5) years or when there are any major changes in the following:
 - (a) surroundings of the RCI (such as new construction of building or housing area); or
 - (b) any major site configuration changes which are defined as deployment of additional (or fewer) of the following:
 - (i) antenna; or
 - (ii) transmitter; or
 - (iii) spectrum band on the RCI;

whichever comes first.

EMF Compliance Assessment

10. The EMF Compliance Assessment shall be conducted based on on-site measurement with worst-case scenario.
11. The Service Providers shall conduct on-site measurement and/or prediction methods for the RCI upon request by the Commission.
12. The EMF Compliance Assessment shall be conducted using the latest technical site information.
13. The details on prediction methods and on-site measurement are described in the *Technical Code on Prediction and Measurement of RF EMF Exposure from Base Station (MCMC MTSFB TC G032)* and the *Technical Code on Prediction and Measurement of RF EMF Exposure from Terrestrial Radio and Television Broadcasting Transmitter Stations (MCMC MTSFB TC G033)*.

EMF Compliance Report

14. The EMF Compliance Report as described in the *MCMC MTSFB TC G032* and the *MCMC MTSFB TC G033* shall be verified by the appointed organisation, as duly notified by the Commission, prior to its submission to the Commission. The EMF Compliance Report shall be valid up to five (5) years from the submission of the same to the Commission or when there are any major changes on the RCI as defined in paragraph 9 of this Determination, whichever comes first.
15. For multiple sites having RCI with similar technical specification(s) and environment, the Service Providers are allowed to use the same EMF Compliance Report if the Service Providers are able to demonstrate the similarity of the sites.

Shared Sites

16. The categories of Shared Sites for base station are described in the *MCMC MTSFB TC G032*.
17. The Shared Sites for broadcasting transmitter station are described in the *MCMC MTSFB TC G033*.
18. The RF Owner for each Shared Site shall be decided by the relevant Service Providers that share the same site. The principles of determining the RF Owner for Shared Site depends on the ownership as specified in the *MCMC MTSFB TC G032* and the *MCMC MTSFB TC G033*.
19. The responsibilities of the RF Owner shall be as follows:
 - (a) to ensure the EMF Compliance Assessment of the site is conducted;
 - (b) to ensure remedial measures in the event of non-compliance; and
 - (c) to ensure the conduct of the EMF Compliance Assessment, in the event there are any major configuration changes on the RCI.
20. The Service Providers at the Shared Sites shall collaborate with the RF Owner. The responsibility of conducting the EMF Compliance Assessment of the Shared Sites lies equally with all the Service Providers at the Shared Sites.

Submission of EMF Compliance Declaration and EMF Compliance Report

21. The Service Providers shall submit the EMF Compliance Declaration and the EMF Compliance Report to the Commission in accordance with paragraph 24 of this Determination.
22. The Service Providers that submit the EMF Compliance Declaration and/or the EMF Compliance Report that is found to be false or misleading, shall be regarded as failing to comply with this Determination and commits an offence.
23. In the case of the EMF exposure level found to exceed the EMF exposure limit as specified in Table 1 of this Determination, the Service Providers shall identify the causes and implement remedial measures to ensure compliance.

24. The EMF Compliance Declaration shall be submitted together with the EMF Compliance Report via an online system identified by the Commission within the following timeline:
- (a) for existing sites, within twelve (12) months after this Determination comes into operation;
 - (b) for new sites that have similar technical specification(s) with the existing site(s), within two (2) months after the operation of the new sites;
 - (c) for new sites not having similar technical specification(s) with the existing site(s), within two (2) months after the operation of the new sites;
 - (d) for any major configuration changes on the RCI, within two (2) months after the said changes; and
 - (e) for the renewal of the EMF Compliance Declaration and/or the EMF Compliance Report as specified in paragraph 25 of this Determination, at least two (2) months before the expiry of the existing EMF Compliance Declaration and/or EMF Compliance Report.
25. The EMF Compliance Declaration and the EMF Compliance Report shall be void if there are any major changes on the RCI as defined in paragraph 9 of this Determination, or has exceeded the validity of five (5) years, whichever comes first. Under such circumstances, a new EMF Compliance Declaration and EMF Compliance Report shall be submitted as specified in paragraph 21 of this Determination.
26. The EMF Compliance Declaration may be exempted for sites that had already submitted the EMF Compliance Report before this Determination comes into operation, unless there are any major changes on the RCI as defined in paragraph 9 of this Determination or the EMF Compliance Report has exceeded the five (5) years period from its submission date.
27. The Service Providers shall publish and maintain the EMF Compliance Declaration in the Service Providers' website containing the EMF exposure level information that is accessible by the public or any interested parties.

Precautionary and Safety Preventive Measures

28. The Service Providers shall ensure provision of proper precautionary and preventive measures for protection of the General Public and workers, from exposure to the EMF above applicable limits.
29. The Service Providers shall ensure appropriate signages as described in the *Guidelines for limiting exposure to time-varying electric, magnetic and electromagnetic fields - Part 2: For frequency from 100 kHz to 300 GHz (MS 2232-2)* are in place in an appropriate location and manner so that they are clearly visible and legible.
30. For sites using millimetre wave (mm Wave) transmitter(s), the size for signage should be of appropriate size.
31. The Service Providers/site owners shall ensure only the EMF Trained Personnel or persons accompanied by the EMF Trained Personnel are allowed to access areas of the site above the General Public limits.

Revocation

32. The Commission Determination on the Mandatory Standard for Electromagnetic Field Emission from Radiocommunications Infrastructure, Determination No. 1 of 2010 shall be revoked with effect from 1 November 2021.

Made: 28 October 2021



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Chairman
Malaysian Communications and Multimedia Commission