



Malaysian Communications and Multimedia Commission
Suruhanjaya Komunikasi dan Multimedia Malaysia

Public Inquiry Report

**REVISION OF THE MANDATORY STANDARD FOR ELECTROMAGNETIC
FIELD EMISSION FROM RADIOCOMMUNICATIONS INFRASTRUCTURE –
DETERMINATION NO. 1 OF 2010**

15 October 2021

This Public Inquiry Paper was prepared in fulfilment of Sections 58 and 61 of the
Communications and Multimedia Act 1998.

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1. INTRODUCTION

- 1.1 The Mandatory Standard for Electromagnetic Field Emission from Radiocommunications Infrastructure – Determination No. 1 of 2010 (MS EMF), came into operation on 1 January 2011. The purpose of MS EMF is to ensure industry-wide compliance with the standard as well as to reinforce public confidence on the matter.
- 1.2 As the MS EMF is already more than ten (10) years in operation, some of the requirements need to be revisited to ensure that it is up to date. It was noted that the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields (up to 300 GHz) which is used as a basis for exposure limit has also been revised in 2020. Therefore, it is timely for the MS EMF be revised to ensure that it is in line with the current development and latest demand.
- 1.3. The proposed revision of the MS EMF is developed based on international best practices where possible by taking into consideration current and future technologies. The revision of MS EMF aims to strengthen the implementation of MS EMF in ensuring safety of the general public and workers. The revised MS EMF is targeted to be effective once the existing MS EMF is revoked.

2. PUBLIC INQUIRY EXERCISE

- 2.1 In the Public Inquiry (PI) document on the proposed revision of the MS EMF issued on 19 July 2021, the PI document outlines the revision of existing MS EMF which contain the changes made as follows:
 - a) modification of paragraphs;
 - b) addendum (addition of new paragraphs); and
 - c) deletion of paragraphs.
- 2.2 The PI document invited feedback from public and relevant stakeholders on MCMC's proposed revision of the MS EMF. The PI document specifically sought comments for all proposed changes to the standard.

2.3 By the end of the PI period at 12 noon on 17 September 2021, MCMC received sixteen (16) submissions from the following parties:

No	Submitting Parties	Submission Date
1.	Maxis Broadband Sdn Bhd (“Maxis”)	14 September 2021
2.	Telekom Malaysia Berhad (“TM”)	15 September 2021
3.	Asean Saintifik Sdn Bhd (“Asean Saintifik”)	16 September 2021
4.	Celcom Axiata Berhad (“Celcom”)	17 September 2021
5.	Cisspr Sdn Bhd (“Cisspr”)	17 September 2021
6.	Digi Telecommunications Sdn Bhd (“Digi”)	17 September 2021
7.	Digital Nasional Berhad (“DNB”)	17 September 2021
8.	EdgePoint Towers Sdn Bhd (“EdgePoint”)	17 September 2021
9.	Ericsson Malaysia Sdn Bhd (“Ericsson”)	17 September 2021
10.	GSMA APAC (“GSMA”)	17 September 2021
11.	Liang Chung Tan (Public) (“Liang Chung Tan”)	17 September 2021
12.	Malaysian Nuclear Agency (“Nuklear Malaysia”)	17 September 2021
13.	MYTV Broadcasting Sdn Bhd (“MYTV”)	17 September 2021
14.	U Mobile Sdn Bhd (“U Mobile”)	17 September 2021
15.	Webe Digital Sdn Bhd (“Webe”)	17 September 2021
16.	YTL Communication Sdn Bhd (“YTL”)	17 September 2021

2.4 MCMC considered these sixteen (16) submissions and the summary of comments/suggestions are outlined in this report in which this PI Report is presented within the 30-day requirement from the closing date of submissions, as stipulated under section 65 of the Communications and Multimedia Act 1998 (“CMA”). MCMC thanks the abovementioned parties for their participation in this consultative process and for providing their submissions and feedback.

2.5 MCMC proposes to issue a Commission Determination that will reflect the Commission’s final views expressed in this PI Report in respect of the Mandatory Standard for Electromagnetic Field Emission from Radiocommunications Infrastructure.

3. STRUCTURE OF THE PUBLIC INQUIRY REPORT

3.1 The remainder of this PI Report is structured to provide context for MCMC's questions for comments, as follows:

I. Input from Public Inquiry and Commission's Final View

a. Part A: The Definitions and Interpretation Part of the revised Mandatory Standard for Electromagnetic Field Emission from Radiocommunications Infrastructure

i. Question 1: The Commission seek views on the proposed definitions and interpretation part added in the Mandatory Standard for Electromagnetic Field Emission from Radiocommunications Infrastructure.

b. Part B: Proposed Revision on the Mandatory Standard for Electromagnetic Field Emission from Radiocommunications Infrastructure

i. Question 2: The Commission seek views on the proposed modification to the Mandatory Standard for Electromagnetic Field Emission from Radiocommunications Infrastructure as stated in Table 1.

ii. Question 3: The Commission seek views on the proposed addendum to the Mandatory Standard for Electromagnetic Field Emission from Radiocommunications Infrastructure as stated in Table 1.

iii. Question 4: The Commission seek views on the proposed deletion of paragraphs from the existing Mandatory Standard for Electromagnetic Field Emission from Radiocommunications Infrastructure as stated in Table 1.

II. The Way Forward

4. INPUT FROM PUBLIC INQUIRY AND COMMISSION'S FINAL VIEW

4.1 PART A: THE DEFINITIONS AND INTERPRETATION PART OF THE REVISED MS EMF

4.1.1

QUESTION 1: THE COMMISSION SEEK VIEWS ON THE PROPOSED DEFINITIONS AND INTERPRETATION PART ADDED IN THE MANDATORY STANDARD FOR ELECTROMAGNETIC FIELD EMISSION FROM RADIOCOMMUNICATIONS INFRASTRUCTURE.

4.1.1.1

Definitions and Interpretation: Clause 3 (c)

“Compliance Statement” means a statement indicating the site complies with EMF (as defined herein) exposure limits as specified in Table 1 of this Determination;

“EMF Compliance Declaration” means the declaration of compliance that specifies the location and the Compliance Statement (as defined herein) for each site, as referred to in paragraph 9 of this Determination;

Submitting Party	Comments
<ul style="list-style-type: none"> • Digi • MYTV • TM • Webe • U Mobile 	Agreed with the proposed definition
Celcom	a) To delete “Compliance Statement” as the term is not used in the MS EMF. b) To amend “EMF Compliance Declaration” for better clarity as follows: <i>“EMF Compliance Declaration” means the declaration of compliance of a site with the EMF exposure limit specified in Table 1 of this Determination.</i>
Maxis	To define as follows: “Compliance Statement” means one statement indicating all the site operated by the service provider complies with EMF (as defined herein) exposure limits as specified in Table 1 of this Determination; “EMF Compliance Declaration” means the declaration of compliance that specifies one Compliance Statement (as defined herein) for all sites, as referred to in paragraph 9 of this Determination;
<ul style="list-style-type: none"> • DNB • YTL • Nuklear Malaysia • GSMA 	No comment received

Submitting Party	Comments
<ul style="list-style-type: none"> • Ericsson • Cisspr • Asean Saintifik • EdgePoint • Liang Chung Tan 	

Commission’s Final View:

The Commission acknowledged the comments received.

For clarity purposes, the Commission decided to amend the definition of “EMF Compliance Declaration” by adding the phrase “a site with the EMF Exposure Limit specified in Table 1”.

The Commission decided to remove the definition of “Compliance Statement” since it is incorporated in the amended definition of “EMF Compliance Declaration”.

4.1.1.2

Definitions and Interpretation: Clause 3 (c)

“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;

Submitting Party	Comments
<ul style="list-style-type: none"> • Digi • MYTV • TM • U Mobile 	Agreed with the proposed definition
Celcom	<p>Proposed to amend “EMF Trained Personnel” for better clarity as follows:</p> <p><i>“EMF Trained Personnel” means a person who may be occupationally exposed to EMF at work and has received necessary information and training <u>by the respective company</u> relating to the said exposure and made aware of any mitigation measures needed to comply with the EMF exposure limits.</i></p>
DNB	<ul style="list-style-type: none"> • Proposed an alignment with ICNIRP Guidelines for the definition for EMF Trained Personnel as below: <p><i>“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 <u>and trained to employ the appropriate mitigation measures</u></i></p> • Proposed to add the definition for ‘general public’ used in EMF Exposure Limits:

Submitting Party	Comments
	<i>“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 EMFs;</i>
<ul style="list-style-type: none"> • Maxis • Webe • YTL • Nuklear Malaysia • GSMA • Ericsson • Cisspr • Asean Saintifik • EdgePoint • Liang Chung Tan 	No comment received

Commission’s Final View:

The Commission acknowledged the comments received.

For clarity purposes, the Commission decided to:

- a) amend the definition of “EMF Trained Personnel” by adding the phrase “and trained to employ the appropriate mitigation measures”; and
- b) add a new definition on “General Public” which is in line with the term used in the ICNIRP Guidelines 2020.

4.1.1.3

Definitions and Interpretation: Clause 3 (c)

“Complex RCI” means radiocommunications infrastructures with two (2) or more antennas/transmitter;

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

Submitting Party	Comments
<ul style="list-style-type: none"> • Digi • MYTV • U Mobile 	Agreed with the proposed definition
<ul style="list-style-type: none"> • TM • Webe 	<ul style="list-style-type: none"> • Complex RCI requested further clarification on whether multiple spectrum band using single antenna is also categorised as complex RCI. • Single RCI proposed to add ‘antenna’ after panels to provide more clarity. <i>...[including three (3) sectors/panels <u>antennas</u> for coverage in all directions]</i>

Submitting Party	Comments
<ul style="list-style-type: none"> • Celcom • DNB • Maxis • YTL • Nuklear Malaysia • GSMA • Ericsson • Cisspr • Asean Saintifik • EdgePoint • Liang Chung Tan 	No comment received

Commission’s Final View:

The Commission acknowledged the comments received.

The Commission decided to amend the definitions of “Complex RCI” and “Single RCI” to provide better clarity.

4.1.1.4

Definitions and Interpretation: Clause 3 (c)

“RF Owner” means a party responsible for EMF related works to ensure compliance;

Submitting Party	Comments
<ul style="list-style-type: none"> • Digi • MYTV • TM • Webe • U Mobile 	Agreed with the proposed definition
Maxis	“RF Owner” means a party who owns and operates the RF equipment responsible for EMF related works to ensure compliance as defined in the relevant technical code(s).
<ul style="list-style-type: none"> • Celcom • DNB • YTL • Nuklear Malaysia • GSMA • Ericsson • Cisspr • Asean Saintifik • EdgePoint • Liang Chung Tan 	No comment received

Commission’s Final View:

The Commission acknowledged the comments received. However, the Commission decided to amend the definition of “RF owner” to provide better clarity on EMF related works.

4.1.1.5

Definitions and Interpretation: Clause 3 (c)

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

Submitting Party	Comments
<ul style="list-style-type: none">• Digi• MYTV• U Mobile	Agreed with the proposed definition
Celcom	To amend “Service Providers” for better clarity as follows: <i>“Service Providers” means all network facilities providers and network service providers operating RCI <u>and spectrum assigned to it</u> which emit EMF for the purpose of communications.</i>
<ul style="list-style-type: none">• TM• Webe	To omit ‘operating RCI’ as network facilities providers and network service providers are the parties who operate the radio equipment which emit EMF, not the RCI. <i>all network facilities providers and network service providers which emit EMF for the purpose of communications</i>
<ul style="list-style-type: none">• DNB• Maxis• YTL• Nuklear Malaysia• GSMA• Ericsson• Cisspr• Asean Saintifik• EdgePoint• Liang Chung Tan	No comment received

Commission’s Final View:

The Commission acknowledged the comments received.

The Commission decided to maintain the definition as the term “Service Providers” is already clearly defined.

4.1.1.6

Definitions and Interpretation: Clause 3 (c)

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

Submitting Party	Comments
<ul style="list-style-type: none">• Digi• MYTV• U Mobile• TM• Webe• Celcom	Agreed with the proposed definition
<ul style="list-style-type: none">• DNB• Maxis• YTL• Nuklear Malaysia• GSMA• Ericsson• Cisspr• Asean Saintifik• EdgePoint• Liang Chung Tan	No comment received

Commission’s Final View:

The Commission acknowledged the comments received.

Generally, all submitting parties supported and agreed with the definition. As such, the Commission decided to maintain the definition.

4.1.1.7

Definitions and Interpretation: Clause 3 (c)

New definition proposed

Submitting Party	Comments
Celcom	To add “Model Site” to facilitate the reuse of EMF Compliance Declaration and EMF Compliance Report as follows: <i>“Model Site” means the site category that require EMF Compliance Assessment whereby the EMF Compliance Report of these sites can be used for other sites having RCI with similar technical specification(s).</i>

Commission's Final View:

The Commission acknowledged the comment received.

As the term is not applicable in the MS EMF, the proposal to add the "Model Site" is not accepted.

4.1.1.8 General Comments

General Comment 1	
Submitting Party	Comments
GSMA	<p>Replace 'emission' by 'exposure' as the standard is about exposure control. If accepted this will need to be implemented throughout the document.</p> <p>Amendments REVISION OF THE MANDATORY STANDARD FOR ELECTROMAGNETIC FIELD EMISSION <u>EXPOSURE</u> FROM RADIOCOMMUNICATIONS INFRASTRUCTURE</p>

Commission's Final View:

The Commission acknowledged the comment received.

For consistency with the Ministerial Direction on the Standard for Electromagnetic Field Emission from Radiocommunications Infrastructure, Direction No. 7 of 2010, the Commission decided to maintain the title of the Determination.

General Comment 2	
Submitting Party	Comments
GSMA	<p>GSMA recommends use of RF-EMF for the frequency range 100 kHz to 300 GHz. This is the termed used in ITU-T and ITU-D documents. If this change is accepted, then consider replacing EMF throughout the document. Amendments "RF-EMF" means radiofrequency electromagnetic fields, being the part of the electromagnetic spectrum comprising the frequency range from 100 kHz to 300 GHz.</p>
YTL	<p>YTL proposed that the letters 'RF' be added before the EMF in the definition and consequently where it appears in the proposed mandatory standards. The 2020 ICNIRP Guidelines use the term Radiofrequency electromagnetic fields or RF EMF.</p>

Commission's Final View:

The Commission acknowledged the comments received.

The Commission decided to maintain the definition since the term "EMF" clearly defined as radiofrequency electromagnetic fields, being the part of the electromagnetic spectrum comprising the frequency range from 100 kHz to 300 GHz. Therefore, the use of "RF-EMF" is not necessary.

4.2 PART B: PROPOSED REVISION ON THE MANDATORY STANDARD FOR ELECTROMAGNETIC FIELD EMISSION FROM RADIOCOMMUNICATIONS INFRASTRUCTURE

4.2.1

QUESTION 2: THE COMMISSION SEEK VIEWS ON THE PROPOSED MODIFICATION TO THE MANDATORY STANDARD FOR ELECTROMAGNETIC FIELD EMISSION FROM RADIOCOMMUNICATIONS INFRASTRUCTURE AS STATED IN TABLE 1.

4.2.1.1

Modification: Paragraphs 6 & 7 of existing MS EMF (Paragraph 5 of revised MS EMF)

EMF Exposure Limit in Tables 1 and 2 of the MS EMF have been modified in line with Table 5 of the ICNIRP Guidelines 2020.

Submitting Party	Comments
<ul style="list-style-type: none"> • Celcom • Maxis • MYTV • TM • U Mobile • Webe • YTL 	<p>Agreed with the proposed modification.</p>
Digi	<p>Digi agreeable and accept to comply with ICNIRP 2020.</p> <p>The exposure levels from the radio communications base stations are safe to the public. However, Digi do understand that while there is still a concern from the Rakyat and ongoing awareness is important, it is equally critical that the relevant government agencies collaborate in addressing the concerns that may arise among the public.</p> <p>It is important to establish Standard Operating Procedure (SOP) for any complaints regarding EMF at the local councils and local authorities, and best to be streamlined across all relevant parties.</p>
Ericsson	<p>Ericsson supports the modification in MCMC's Proposed Revision to the MS EMF (Tables 1) in line with Table 5 of ICNIRP 2020 Guidelines. We recommend that the ICNIRP guidelines are adopted in full, that is also basic restrictions in addition to reference levels.</p>
GSMA	<p>The GSMA supports the decision to incorporate the limits from ICNIRP (2020).</p> <p>GSMA notes that ICNIRP (2020) states (bold emphasis added) <i>Reference levels have been derived to provide an equivalent degree of protection to the basic restrictions, and thus an exposure is taken to be compliant with the guidelines if it is shown to be below either the relevant basic restrictions or relevant reference levels.</i></p>

Submitting Party	Comments
	<p>Point b) of the MCMC rationale may not be valid where workers need to access areas close to antennas.</p> <p>Point c) of the MCMC rationale may not be valid as whole-body and local SAR are determined under different conditions.</p> <p>GSMA recommends that the revised Mandatory Standard also include Table 2 and Table 6. The RF-EMF compliance for some base station equipment, such as small cells, may be determined by manufacturers using either or both basic restrictions (Table 2) or local exposure reference levels (Table 6).</p> <p>Amendments Include also ICNIRP (2020) Table 2 and Table 6.</p>
<ul style="list-style-type: none"> • DNB • Nuklear Malaysia • Cisspr • Asean Saintifik • EdgePoint • Liang Chung Tan 	<p>No comment received</p>

Commission's Final View:

The Commission acknowledged the comments received.

The Commission decided to maintain reference to Table 5 of ICNIRP Guidelines 2020 as presented in Table 1 of the revised MS EMF, where the content for Table 5 of ICNIRP Guidelines 2020 is relevant to the scope of MS EMF, which is meant for assessment for EMF exposure over the whole body from the RCI. As such, compliance for the occupational situation should also be based on the said table.

The Commission also of the view that having to only use Table 5 of ICNIRP Guidelines 2020 provides better clarity for compliance to the MS EMF.

4.2.1.2

Modification: Paragraphs 8 & 9 of existing MS EMF (Paragraphs 6, 7 and 8 of revised MS EMF)

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 the height of below 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.

Submitting Party	Comments
<ul style="list-style-type: none"> • Celcom • Digi • TM • U Mobile • Webe • YTL 	<p>Agreed with the proposed modification.</p>
<p>GSMA</p>	<p>The GSMA supports the MCMC approach of using the criteria in IEC 62232 for site classification. GSMA recommends that the full range of IEC 62232 classes, including E100 and E+, are also incorporated.</p> <p>Amendments</p> <p><i>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. <u>Where applicable transmitters with an EIRP ≤ 100 W or > 100 W may be subject to a simplified evaluation process as described in IEC 62232.</u></i></p> <p>The GSMA supports the MCMC approach of using the criteria in IEC 62232 for site classification. GSMA recommends that the full range of IEC 62232 classes, including E100 and E+, are also incorporated.</p>
<p>Maxis</p>	<p><u>Paragraph 6</u></p> <p>Based on on-site measurements and simulation reports conducted to-date, the results have consistently produced values well below MCMC's MS EMF and ICNIRP guidelines. Further, EMF exposure does not exceed the MS EMF / ICNIRP threshold limits even with multiple operators sharing the same site. For example, based on historical EMF measurements show that EMF exposure in terms of percentage power density relative to MCMC's maximum allowed limit range from 0.0953% to 2.3660%. In another example, UK telecoms regulator OFCOM in 2020 carried out EMF measurements at 33 locations near to 5G mobile phone base stations in 18 towns. Such measurements showed that highest all band exposure levels ranged between 0.04% to 7.1% while the second highest level was only 1.5%. The highest level observed in 5G band used was just 0.23%. Considering all EMF simulation reports generated show full compliance, Maxis propose that MCMC do not mandate mandatory</p>

Submitting Party	Comments
	<p>compliance assessment. EMF simulation reports can be generated for selected sites if MCMC believes that a site may not be compliant to the public EMF exposure limits.</p> <p><u>Paragraph 7</u></p> <p>Considering that relatively low-powered base station transmitters (2W-10W EIRP) with antenna height 2.2 m or higher expected to produce minimal exposure levels, we agree to this exclusion. For example, an antenna transmitting at 10W EIRP would produce exposure with power density of 0.16W/m² at 2.2 meters. At 1 m distance, the power density rises to 0.84 W/m². In fact, the power density reaches the 900MHz public exposure limit of 4.5 W/m² at just 42cm away from the antenna.</p> <p><u>Paragraph 8</u></p> <p>We agree that transmitters that are 2W EIRP or less are deemed compliant and no further action is deemed necessary.</p>
MYTV	<p>6(a) – propose to add greater than 10W but not more than 100W, antenna height at 2.5m (to match with figure 2 in Technical Code)</p> <p>Information on Installation Class:</p> <ol style="list-style-type: none"> 1. Class E100 (10W and less than 100W, minimum height 2.5m) 2. Class E10 (2W and less than 10W, minimum height 2.2m) 3. Class E2, less than 2W 4. Class E+, no limit of EIRP, minimum antenna height needs to be calculated. <p>Remark: Broadcast antenna is in Class E+, minimum antenna height need to be calculated. Calculation formula as in IEC 62232 paragraph 6.2.5.</p> <p>Propose to add paragraph with statement for no assessment required for broadcast antenna as the antenna located on the tower, antenna height above the minimum height requirement. If not stated, broadcast antenna will fall under paragraph 6(a) (assessment is required).</p> <p>Which category need to comply (beside 6(a) and 6(b)?</p> <ol style="list-style-type: none"> 1. New station 2. Existing station 3. By request
Asean Saintifik	<p>Anything above 2W below the height of 2.2 meters need to be measure. Doesn't matter it is 5W, 10W or more than 10W.</p>
<ul style="list-style-type: none"> • DNB • Nuklear Malaysia • Ericsson • Cisspr • EdgePoint • Liang Chung Tan 	<p>No comment received</p>

Commission’s Final View:

The Commission acknowledged the comments received.

The Commission is of the view that for transmitter operating above 10 Watts shall be subjected to EMF Compliance Assessment, to provide safety assurance for the general public.

Considering the above, the Commission decided to maintain the paragraphs 6 to 8 of the revised MS EMF.

4.2.1.3

Modification: Paragraphs 10 to 17 of existing MS EMF (Paragraph 10 of revised MS EMF)

10. The EMF Compliance Assessment shall be conducted based on the following methods:

(a) Prediction methods:

(i) calculation for single RCI;

(ii) advanced computation using a simulation software for complex RCI;

OR

(b) On-site measurement.

Submitting Party	Comments
MYTV	Agreed with the proposed modification.
Celcom	<p>a) Prediction method is more effective and appropriate method as compared to on-site measurement for EMF Compliance Assessment due to the following justifications:</p> <ul style="list-style-type: none"> • More vendors are available for prediction method • Faster and more affordable • Suitable for all type of sites <p>b) Celcom opine that on-site measurement should be removed from the option for the EMF Compliance Assessment method in the MS EMF so that it is not mandatory. It is not a common global practice to mandate assessment and submission of report using on-site measurement. The mandatory requirement for on-site measurement will impose unnecessary increased regulatory cost as the price is approximately 20 to 35 times higher than advanced computation using a simulation software.</p> <p>c) Advanced computation using a simulation software is able to provide results with high accuracy as long as it is performed in accordance with the requirements stated in Technical Code MTSFB 077.</p> <p>In view of the above, Celcom would like to propose for the following amendment to the newly modified “Paragraph 10”:</p> <p><i>“10. The EMF Compliance Assessment shall be conducted based on the following <u>prediction</u> methods:</i></p> <p><i>a) Prediction methods:</i></p> <p style="margin-left: 40px;"><i>(i) calculation for single RCI; or</i></p>

Submitting Party	Comments
	<p>(ii) <i>advanced computation using a simulation software for complex RCI;</i></p> <p>OR</p> <p>b) On-site measurement."</p>
Digi	<p>Digi takes note on the alternative method introduced by the Commission's, "on site measurement". Digi would like to further recommend for on-site measurement to be done only for 122 similarity model for on-site testing.</p> <p>Digi together with the industry (which is refers to Celcom, Maxis, U Mobile, Webe and YTL) have identified 122 similarity models.</p> <p>Digi support the Commission on the consideration for the use of the same EMF Compliance Report for sites with similar RCI technical specification(s) as mentioned in the PI. Further study has been conducted based on the actual configuration site setup. The constant parameter in formulating the similarity involved the following:</p> <p>a) 3 location types (Urban, Sub-Urban and Rural)</p> <p>b) 9 structure type (3 Legged, 4 Legged, Billboard, Minaret, Mini Monopole (RT), Monopole/Monopole Tree, Streetlight/Lamp Pole, Wall Mounted/Tripod (RT) and Water Tank)</p> <p>The variables will be based on total number of sharers at a particular site. In result, a total of 122 similarities of site was produced and this has covered all possible arrangements of the site as to date.</p>
GSMA	<p>GSMA welcomes this change and proposes the addition of the simplified evaluation process in IEC 62232.</p> <p>GSMA notes that EMF Compliance Assessments can be conducted for the majority of base station sites by use of the IEC product installation classes or by prediction/calculation methods. GSMA also recognizes that measurements may be preferred for technical reasons in conducting some EMF Compliance Assessments for base stations. GSMA propose to clarify this point to ensure that the option for measurements is available only where technically justified.</p> <p>Amendments</p> <p>10. <i>The EMF Compliance Assessment shall be conducted based on the following methods:</i></p> <p>(a) <i>Prediction methods:</i></p> <p>(i) <i>calculation for single RCI;</i></p> <p>(ii) <i>advanced computation using a simulation software for complex RCI;</i></p> <p>(iii) <u><i>product installation classes using the simplified evaluation process as set out in IEC 62232</i></u></p> <p>OR</p> <p>(b) On-site measurement <u>only where technically justified.</u></p>
Maxis	<p>Maxis support that EMF Compliance assessment can be through prediction methods which has been used by service provider which reflect conservative value. Maxis however propose that on-site measurement is not to be a basis for EMF compliance assessment. This is because the difficulty, time-consuming and relatively high cost of</p>

Submitting Party	Comments
	<p>on-site measurement including complications arising from ongoing Covid-19 restrictions. As such we propose that on-site measurements to only be used to address complaints or requests from interested parties including regular assessment by MCMC. As explained above, OFCOM for example regularly conducts EMF compliance on-site measurements of EMF levels in the vicinity of mobile base stations. In 2020, OFCOM carried out EMF measurements at 33 locations in 18 towns and cities across UK. Results of these measurements confirms Maxis' experience whereby EMF levels are well within the levels identified in the ICNIRP guidelines adopted by MCMC.</p>
<p>Nuklear Malaysia</p>	<p>The proposed revision No.10 MS EMF has clearly mentioned on the prediction or measurement option for the service provider for the compliance assessment based on suitability.</p> <p>Based on this Nuklear Malaysia would like to suggest:</p> <ol style="list-style-type: none"> i. Enforcement should be strictly implemented to ensure the compliance. The enforcement method and penalty to be elaborated in this document or any related document. ii. Schedule audit shall be implemented by measurement yearly, example 10% of the RCI around Malaysia. We are facing the perception that EMF level is harmful and to counter back we need scientific data. This is to demonstrate of real data through the real on-site safety assessment by measurement. Scientific data is very critical to gain public trust as new technology like 5G will be implemented and the number of RCI would increase and the location will get nearer to the residential and commercial area.
<p>TM</p>	<p>TM is of the view that the current practice of EMF simulation report is sufficient to monitor the EMF exposure level and more economic compared to on-site measurement.</p> <p>In terms of simulation methodologies, TM considers that the present MCMC's CIMS should be enhanced to incorporate the EMF simulation capabilities, as all of the Service Provider's technical data is currently stored in the CIMS. This would help the EMF simulation result to be generated directly from CIMS as and when required.</p> <p>TM would like to propose to add the below statement for 10(b): <i>Should there be any request for on-site measurement, the requestor should bear the cost.</i></p>
<p>U Mobile</p>	<p>U Mobile is agreeable to Prediction methods only, according to the 122 site models (similar sites) as proposed.</p> <p>However, taking into account public health concerns on EMF exposure, if there is any public complaint on EMF, U Mobile proposes to adopt the "SOP Bantahan" approach by Penang and Negeri Sembilan.</p>
<p>Webe</p>	<p>Webe would like to propose that the Single RCI and less Complex RCI to be excluded from this requirement. The current radio transmission for each spectrum is governed by Standard Radio System Plan (SRSP) which we trust technically have addressed the EMF requirement.</p> <p>Webe would like to propose to remove the statement for 10(b):</p>

Submitting Party	Comments
	<p>(b) On-site measurement.</p> <p>Webe is of the view that the current practice of EMF simulation report is sufficient to monitor the EMF exposure level and more economic compared to onsite measurement.</p> <p>In terms of simulation methodologies, Webe considers that the present MCMC's Communication Infrastructure Management System ("CIMS") should be enhanced to incorporate the EMF simulation capabilities, as all of the Service Provider's technical data is currently stored in the CIMS. This would help the EMF simulation result to be generated directly from CIMS as and when required.</p>
YTL	<p>YTL agrees to maintain only Prediction Method on EMF Compliance Assessment report. On site measurement will only be carried out for any complaint by 3rd party or request by MCMC. The cost will be borne by complainant.</p>
Cisspr	<p>Disagree with this modification.</p> <p>This modification gives an option as "Prediction Methods OR On-site Measurements". NO OPTION should be given. There should be criteria given to specify when prediction is allowed, and when on-site measurement is required.</p> <p>If an option is given, no service provide will choose on-site measurement. Every site will end up doing simulation.</p> <p>Simulation can be accepted however, in areas where population density is very low, where the RCI is located in a place where it is further than say 500m from the nearest residential area, or worship areas such as mosque, church, or temples, and where no children are involved such as daycare, kindergarten, schools etc, as well as hospitals.</p> <p>In places where it is less than 500m from residential area, where people gather for worship, where children and the sick are located, there should be NO option for simulation. It should always be specified that On-site measurement is REQUIRED in places like this.</p>
Asean Saintifik	<p>Prediction method base on what kind of data? From Technical Survey Report (TSSR)? How accurate is this data? Who can verify the data? If the data not accurate, it led to all wrong prediction method.</p> <p>Measurement will be a more convincing method and correct measurement with proper technique are important.</p>
Liang Chung Tan	<p>Disagree with Prediction as this involves Simulation.</p> <p>Simulation is as just as good as the model it uses, and the input data the model is provided.</p> <p>It is easy to simulate antenna in free space, but it is not possible to accurately simulate antenna and EMF propagation and exposure to humans in real environment. It is very heavily dependent on the terrain, or in other words the surrounding condition, ie buildings, roads, bridges, trees, glass windows, concrete, or wood, or metal, etc.</p>

Submitting Party	Comments
	Prediction CANNOT be an Option for residential areas.
<ul style="list-style-type: none"> • DNB • Ericsson • EdgePoint 	No comment received

Commission’s Final View:

The Commission acknowledged the comments received.

After considering all the comments, the Commission decided to amend paragraph 10 of the revised MS EMF by only making reference to on-site measurement method with worst-case scenario for the EMF Compliance Assessment.

The Commission also decided to add new paragraph to elaborate on the requirement that the Service providers shall conduct on-site measurement and/or prediction methods for the RCI upon request by the Commission.

4.2.1.4

Modification: Paragraph 18 of existing MS EMF (Paragraphs 14, 15 and 16 of revised MS EMF)

14. The categories of Shared Sites for base station are described in the MTSFB 077.

15. The Shared Sites for broadcasting transmitter station are described in the MTSFB 088.

16. 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 MTSFB 077 and the MTSFB 088.

Submitting Party	Comments
MYTV	Agreed with the proposed modification.
Celcom	<p>a) Celcom support MCMC’s proposal to refer to the relevant Technical Codes for the determination of the RF owner for a shared site and its principles as per newly modified Paragraphs 14 - 16.</p> <p>b) In view that the definition and principles for RF owner stated in Technical Code MTSFB 077 are merely addressing the current operation in 2G, 3G and 4G networks as well as non-RAN sharing scenario, we opine that the definition and principles should be updated to address the issue on candidate for RF owner for:</p> <ul style="list-style-type: none"> • 5G sites • MOCN sites • In the event the existing RF owner left the RCI <p>Celcom to propose for the following amendment/addition to the Technical Code MTSFB 077:</p>

Submitting Party	Comments
	<p>a) Add the definition for “Service Provider” in Section 4 of the Technical Code MTSFB 077, adopting the same definition stated in the revised MS EMF as shown below:</p> <p><i>“Service Providers” means all network facilities providers and network service providers operating RCI and spectrum assigned to it which emit EMF for the purpose of communications.</i></p> <p>b) Add a note to Section 6.2 of the Technical Code MTSFB 077 as shown below: Note: 1. The candidate for RF owner shall be from the service providers that operate the spectrum assigned to it to provide network service. MVNO, DR partner, MOCN sharer or any form in similar nature which does not operate the RCI/ spectrum are excluded. 2. The role will be relinquished to the previous RF owner should the current RF owner left the RCI.</p>
Digi	<p>Determination of RF Owner</p> <p>Digi agree with the cite the MTSFB Technical Code 077 for the definition of shared site</p> <p>MTSFB Technical Code 077: 6.2 <i>Principles of determining RF owner for a shared site</i></p> <p><i>The RF owner for each shared site should be decided by the relevant service providers that share the same BS. The list below stipulates the principles of determining a RF owner for a shared site depending on the ownership of the BS:</i></p> <p>a) <i>BS owned by network facilities provider that provides network service; and</i></p> <p><i>BS structure owner is designated as the RF owner. The role will be relinquished to subsequent service operator that comes onboard. Ownership will also change to the service operator who performs upgrade with additional antennas or transmitters.</i></p> <p><i>However, the BS structure owner has the responsibility to inform all existing service operators that are currently operated at the BS if any new tenant came in or change in transmitter or antenna. This is to allow the current RF owner to handover the responsibility to the new RF owner.</i></p> <p>b) <i>BS not owned by the network service provider.</i></p> <p><i>The first comer is designated as the RF owner. The role will be relinquished to subsequent service operator that comes onboard. Ownership will also change to the service operator who performs upgrade with additional antennas or transmitters. However, the BS structure owner has the responsibility to inform all existing service operators that are currently operating at the BS if any new tenant came in or change in transmitter or antenna. This is to allow the current RF owner to handover the responsibility to the new RF owner.</i></p> <p><i>NOTE: While the principles highlighted above are more applicable to new BS that is on-air subsequent to the issuance date of this</i></p>

Submitting Party	Comments
	<p><i>document, it is encouraged for relevant service providers to deliberate on the RF ownership</i></p> <p>However, Digi would like to propose to add additional note under section 6.2 of the said document.</p> <p>The proposed note as below:</p> <p>a) The candidate for RF owner shall be from the service provider that operates the spectrum assigned to it to provide network service. MVNO, DR partner or MOCN sharer who do not operate the spectrum/ equipment are exempted.</p> <p>b) The role will be relinquished to the second last comer should the current RF owner leave the site.</p> <p>This to ensure the definition mentioned will clearly cover all aspect of the arrangement especially for MOCN and 5G.</p>
Maxis	<p><u>Paragraphs 14 and 15</u></p> <p>Maxis has no further comments</p> <p><u>Paragraph 16</u></p> <p>Maxis is currently following the definition of RF owner as reflected in the MCMC's CIMS database. For the avoidance of doubt, we wish to explain that only the "spectrum" owner operating RF equipment at the site shall be qualified to be the RF owner. MVNOs, DR partners or MOCN sharer for example who only provide service over the RF facilities owned by others should not become RF owner. Since the general principle of determining the RF owner for shared sites have been agreed by the industry and included in the MTSFB 077 document, we propose that any refinement needed on such matter to be discussed and agreed via the relevant MTSFB working group(s).</p>
<ul style="list-style-type: none"> • TM • Webe 	<p><u>Paragraphs 14 and 15</u></p> <p>TM and Webe agreed as per proposed revision.</p> <p><u>Paragraph 16</u></p> <p>TM and Webe agreed as per proposed revision.</p> <p>In addition, TM and Webe recommends MCMC to automate the RF Ownership change mechanism via the CIMS platform, in accordance to the principles of determining the RF Owner for Shared Site as specified in the MTSFB 077 and the MTSFB 088.</p> <p>Currently, the RF Owner information is updated in CIMS and MCMC has full visibility on the sharing RCI and Mobile Network/Broadcasting Transmitter data.</p>
U Mobile	<p><u>Paragraphs 14 and 15</u></p> <p>U Mobile has no further comments</p>

Submitting Party	Comments
	<p><u>Paragraph 16</u></p> <p>U Mobile would like to propose to add clarity to the definition the RF Owner definition. The RF Owner should be the person who transmits or use the spectrum assigned to provide the network services.</p>
YTL	<p>The definition of Shared Sites is in accordance to MTSFB 077 which stated the shared site is a multiple service of systems on the same or different radiocommunications infrastructure within a particular location.</p> <p>The responsibility to produce the report should lie on the last sharer of the site.</p> <p>Agreed with the rest.</p>
<ul style="list-style-type: none"> • DNB • Nuklear Malaysia • GSMA • Ericsson • Cisspr • Asean Saintifik • EdgePoint • Liang Chung Tan 	No comment received

Commission’s Final View:

The Commission acknowledged the comments received.

General principle of determining the RF owner for shared sites have been agreed by the industry and included in the Technical Codes MTSFB 077 and MTSFB 088. As such, the Commission decided to maintain the paragraphs 14 to 16 of the revised MS EMF.

The Commission acknowledged and agreed on the suggestion to include the following notes in the MTFSB Technical Codes:

1. The candidate for RF owner shall be from the service providers that operate the spectrum assigned to it to provide network service. MVNO, DR partner, MOCN sharer or any form in similar nature which does not operate the RCI/ spectrum are excluded.
2. The role will be relinquished to the previous RF owner should the current RF owner left the RCI.

The Commission also acknowledged on the general comments given on administrative procedure for implementation of MS EMF.

4.2.1.5

Modification: Paragraphs 19 to 22 of existing MS EMF (Paragraphs 17 and 18 of revised MS EMF)

17. 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 is a change or addition to the particular site.
18. Service Providers at the Shared Sites shall collaborate with the RF Owner. The responsibility of conducting the EMF Compliance Assessment of Shared Sites lies equally with all Service Providers at the Shared Sites.

Submitting Party	Comments
<ul style="list-style-type: none"> • Digi • TM • Webe • YTL 	<p>Agreed with the proposed modification.</p>
<p>DNB</p>	<p>DNB would like to highlight that the new RF owner shall not be held for accountable for clearing the EMF backlog/issues caused by other Service Providers or previous RF Owner.</p> <p>DNB recommends that the vendor/panel contractor (appointed by Service Provider or RF Owner) to collaborate with other Service Providers to perform the EMF measurement.</p>
<p>Maxis</p>	<p><u>Paragraph 17</u></p> <p>Considering all EMF simulation reports generated show full compliance, Maxis propose that MCMC do not mandate mandatory compliance assessment. EMF simulation reports can be generated for selected sites if MCMC believes that a site may not be compliant to the public EMF exposure limits. Maxis agree with the principles of responsibilities of the RF owner who can be the party to help to generate EMF compliance assessment of the site. We also propose that the practical implementation of such principle of RF owner is monitored by the industry for it to be refined if required in the future.</p> <p><u>Paragraph 18</u></p> <p>The Service Providers are collaborating with relevant RF owner for all the shared sites and agree that the responsibility of conducting the EMF compliance assessment of shared sites lies equally with all service providers at shared sites. We understand that cooperation of all service providers contributing to radio communications infrastructure in the shared site is important to ensure timely collaboration.</p>
<p>MYTV</p>	<p>Paragraph 17 – Based on Technical Code for broadcast, it is not a RF owner responsibility but RF owner as a coordinator, for any remedial or/and assessment to be conducted, it will be by the RF licensee.</p>

Submitting Party	Comments
	<p>Extract from Technical Code: 6.3 EMF measurement responsibility for a shared site: For EMF measurement activities involving other RF licensees but not the RF owner, the responsibility for the said activities lies with the respective licensee. For EMF measurement activities involving other RF licensees including the RF owner, the RF owner will be the coordinator for the said activities in collaboration with the other RF licensees.</p>
Asean Saintifik	<p>On top of the RF owner, party who involve also have responsibility and should be clearly define. If the 3rd party do not cooperate with RF owner, RF owner are not able to take action to them if MS do not clarify this. The similar action can be taken not only to RF owner but also the other parties too.</p> <p>On top of the Assessment, Authority should conduct random measurement for certain number of sites every year to make sure the assessment submitted by RF owner are up to certain level of confident level.</p>
<ul style="list-style-type: none"> • Celcom • U Mobile • Nuklear Malaysia • GSMA • Ericsson • Cisspr • EdgePoint • Liang Chung Tan 	No comment received

Commission’s Final View:

The Commission acknowledged the comments received.

Generally, most of the Service Providers agreed with modification of paragraphs 17 and 18 of the revised MS EMF.

With regards to the comments raised on the responsibility of other Shared Sites participants, the Commission is of the view that paragraph 18 has clearly addressed the said concern.

The Commission decided to maintain paragraphs 17 and 18 in the revised MS EMF.

4.2.1.6

Modification: Paragraphs 27 to 29 of existing MS EMF (Paragraph 27 of revised MS EMF)

27. 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 3 kHz to 300 GHz* (MS 2232-2) are in place in an appropriate location and manner so that they are clearly visible and legible.

Submitting Party	Comments
Celcom	<p>a) RF emitted from the telecommunication structure/ transmitter is categorized as non-ionizing radiation. Unlike X-rays or other forms of ionizing radiation, non-ionizing radiation does not have enough energy to remove electrons from atoms or molecules. Non-ionizing radiation will only able to heat substances. According to World Health Organization (“WHO”), the levels of RF exposure from telecommunication structure and wireless networks are so low that the temperature increases are insignificant and do not affect human health. In addition, Malaysia adopts the ICNIRP standards for exposure limit as recommended by the WHO and the Ministry of Health.</p> <p>b) The signage may induce unnecessary fear or invite complaint from public that result in dismantling of site/impede future deployment. This will have adverse impact on the network coverage/ quality and eventually affecting the Jendela program and economy of Malaysia. Hence the warning signage for areas that may exceed public exposure limits is not necessary.</p> <p>c) Telecommunication workers have been briefed on the occupational safety/ potential radiation exposure by own company. Hence, the 2 signages for occupational exposure limit (i.e. warning signage for areas that may exceed occupational exposure limits and warning signage for areas exceeding occupational exposure limits) are not necessary.</p> <p>d) All EMF Compliance Reports generated to-date show full compliance whereby the EMF readings have consistently produced values well below MS EMF and ICNIRP guideline. The requirement for displaying 3 signages at telecommunication site will impose unnecessary increased regulatory cost.</p> <p>e) Many countries do not mandate the display of safety signages at site under Mandatory Standard. In US, signages are not required per se and not all signs are applicable to all services or situations. In Hong Kong, one signage is required to be displayed at the area that is accessible to the general public which EMF exceeds the exposure limits. In many circumstances in Malaysia, these areas are not accessible to the general public due to barrier, gates, lock etc. Areas that are accessible to the general public are usually having EMF readings well below MS EMF and ICNIRP guideline.</p> <p>f) Celcom opine that it is important to establish and streamline policies/processes in addressing public complaints on EMF and at the same time facilitate the development of telecommunication industry. The establishment of a standardized Standard Operating Procedure (“SOP”) for consumer complaints regarding EMF at the local councils and local authorities is at utmost importance. The SOP Bantahan adopted by Penang, Negeri Sembilan and soon by Melaka is a very good and successful practice as it promotes evidence-based approach in managing public complaints on EMF/ radiation.</p>

Submitting Party	Comments
	In view of the above, Celcom would like to propose for MCMC to delete the newly modified Paragraph 27 and not to include the requirement of displaying safety signages in the MS EMF.
Digi	Digi agreeable for this proposal and support the modification that includes the details as per Malaysia Standard Guidelines for limiting exposure to time-varying electric, magnetic and electromagnetic fields - Part 2: For frequency from 100 kHz to 300 GHz, under Section 9 regard to the Warning signs and labels.
Maxis	Maxis is agreeable where service providers to ensure provision of proper precautionary and preventive measures for protection of the public and workers. However, in the implementation of displaying the sign, it should not be a mandatory requirement for such signs to be displayed. The distance away from the main beam of antenna for occupational workers at 900 MHz frequency with 40W EIRP is only about 37.6 cm. In the case of signage for workers, Maxis also propose such requirements are not made mandatory. Nevertheless, Maxis may consider installing signs on a case-by-case basis if absolutely necessary.
MYTV	Paragraph 27 applied to base station only, no signage required for broadcast antenna (deleted in broadcast transmitter Technical Code).
<ul style="list-style-type: none"> • TM • Webe 	<p>TM and Webe are of the view that the signage may not be necessary since the EMF exposure is below the permitted limit as per EMF simulation report result. For the workers, only designated and qualified person is allowed to the site. Hence, the signage is not required.</p> <p>TM and Webe trust that the use of EMF Compliance Declaration which consist of Compliance Statement is sufficient as alternative to displaying safety signage to prove site compliant to EMF exposure limits.</p>
U Mobile	In general, signages might create uneasiness and fear to the public. Moreover, U Mobile have facts to show that base stations only emit low levels of EMF and are fully in compliance with MCMC MS EMF requirements. As such, U Mobile would like to propose to remove the signage requirement.
YTL	<p>YTL has no objection.</p> <p>However, placing of signage can cause alarm amongst the public. Many towers, such as lamp pole structures, are along walkways. The placing of signage could cause public opposition towards placing of towers in such places event though they are absolutely safe.</p> <p>Rather than placing signage on EMF, YTL suggests signage that the structure is safe be put.</p>
<ul style="list-style-type: none"> • DNB • Nuklear Malaysia • GSMA • Ericsson • Cisspr 	No comment received

Submitting Party	Comments
<ul style="list-style-type: none"><li data-bbox="209 244 432 271">• Asean Saintifik<li data-bbox="209 277 379 304">• EdgePoint<li data-bbox="209 311 464 338">• Liang Chung Tan	

Commission's Final View:

The Commission acknowledged the comments received.

In general, most of the Service Providers disagreed with paragraph 27 of the revised MS EMF and proposed it to be deleted.

However, taking into consideration on the safety and protection of the workers and general public, thus, the Commission decided to maintain the paragraph in the revised MS EMF.

4.2.2

QUESTION 3: THE COMMISSION SEEK VIEWS ON THE PROPOSED ADDENDUM TO THE MANDATORY STANDARD FOR ELECTROMAGNETIC FIELD EMISSION FROM RADIOCOMMUNICATIONS INFRASTRUCTURE AS STATED IN TABLE 1.

4.2.2.1

Addendum: Paragraph 9

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 two (2) years or when there are any configuration changes on the RCI, whichever comes first.

Submitting Party	Comments
Celcom	<p>a) Celcom support MCMC's rationale that an EMF Compliance Declaration may be able to provide confidence to the public that the site is safe and comply with the EMF exposure limits. In order to promote operational efficiency, Celcom would like to propose for MCMC to accept an electronic declaration per "model site" that is signed by personnel authorized by the company's CEO.</p> <p>b) As MCMC is aware, all EMF Compliance Reports generated to-date show full compliance with the EMF exposure limits set by the MCMC and ICNIRP. The results/ EMF readings have consistently produced values well below MS EMF and ICNIRP guideline.</p> <p>c) In addition, software and hardware alteration involved in regular network optimization activity i.e. antenna elevation/ azimuth, frequency retuning and bandwidth/ RAN changes within the same spectrum band etc. have nominal impact on EMF reading. As such, EMF Compliance Declaration resubmission is not necessary. Celcom opine that the EMF Compliance Declaration should valid until major configuration changes is made on the RCI. Major configuration changes is defined as deployment of additional (or fewer) antenna, transmitter or spectrum band on the RCI.</p> <p>Propose for the following amendment to the "New Paragraph 9":</p> <p><i>9. The Service Providers are required to make an <u>electronic</u> EMF Compliance Declaration <u>per model site</u> which shall be based on the EMF Compliance Assessment and the EMF Compliance Report. <u>The same EMF Compliance Declaration can be used for other sites having RCI with similar technical specification(s) as the model site.</u> <u>The A new EMF Compliance Declaration shall be submitted to the Commission valid up to two (2) years or when should there be are any major configuration changes on the RCI, whichever comes first.</u> <u>For avoidance of doubt, only the deployment of additional (or fewer) antenna, transmitter or spectrum band on the RCI is considered as major configuration changes on the RCI.</u></i></p>

Submitting Party	Comments
Digi	<p>Digi support the change in configuration that require to be updated on the declaration and report, however, Digi proposed the statement only applicable for “Major change”.</p> <p>The definition of Major change is proposed as follows:</p> <ul style="list-style-type: none"> a) Additional antenna b) Additional transmitter or; c) Additional spectrum band <p>Note: Software and hardware alteration involved in regular network optimization activity i.e. azimuth, elevation etc is proposed to be excluded as the impact on EMF is insignificant.</p>
DNB	<p>The validity of the EMF compliance declaration should not be limited up to 2 years as the EMF conditions would remain unchanged if there is no change in site configuration. This will result in Service Providers incurring operational costs and effort to do the 2-year assessment, even when there is no change in site configuration.</p> <p>Instead, renewal to the EMF Compliance Declaration can be triggered by any Mobile Network Operators (MNOs) during site configuration upgrade.</p>
Ericsson	<p>Ericsson would like to recommend that for the addendum to “EMF Compliance Declaration”. The EMF Compliance Declaration should remain valid and not be limited to only two years if there are no configuration changes to the base station leading to higher EMF exposure levels.</p> <p>Ericsson recommend that the renewal of the EMF Compliance Declaration should only be required if there any configuration changes to the base station that lead to increased EMF exposure levels.</p>
GSMA	<p>The GSMA supports the requirement to submit the EMF Compliance Declaration. The GSMA recommends that the EMF Compliance Report is available on request by the Commission.</p> <p>The GSMA is not aware of any technical reason why an EMF compliance report should have a validity limited two years where there are no site changes.</p> <p>Amendments</p> <p>The addition of new paragraphs on the requirements regarding Submission of EMF Compliance Declaration and EMF Compliance Report are as follows:</p> <ul style="list-style-type: none"> a) <i>EMF Compliance Declaration and EMF Compliance Report shall be submitted to the Commission and the EMF Compliance Report that support the EMF Compliance Certificate made available to the Commission on request;</i> b) <i>EMF Compliance Declaration and EMF Compliance Report shall be submitted within the specified timeline;</i> c) <i>the validity period of EMF Compliance Declaration and EMF Compliance Report are specified by the RF owner; and</i>

Submitting Party	Comments
	<p>d) <i>service providers shall publish and maintain the EMF Compliance Declaration and the EMF Compliance Report in their geospatial mapping website, <u>noting that information posted on the site should not be commercially sensitive, or on request.</u></i></p>
Maxis	<p>Based on on-site measurements and simulation reports conducted to-date, the results have consistently produced values well below MCMC's MS EMF and ICNIRP guidelines. Further, EMF exposure does not exceed the MS EMF/ ICNIRP threshold limits at publicly accessible areas even with multiple operators sharing the same site. As such Maxis request MCMC to reconsider the requirement for service providers to make EMF compliance declarations. Maxis however propose to provide a general EMF compliance declaration based on their assessments on best installation practices along with other assessments made that show all EMF simulation reports generated show full compliance. Based on the above proposal, Maxis propose that such one general EMF compliance declaration can be submitted once every 2 years based on network. Maxis will ensure that any RFI configuration changes made are always within the threshold of MS EMF exposure limit.</p> <p>Maxis propose that definition of "configuration changes" to be defined when antennas, transmitters, or spectrum bands are added to the site. Software and hardware alteration involved in network optimization activity such as azimuth, elevation etc., should not be considered configuration changes. When such configuration changes are made, Maxis propose that we assess existing simulation report for a site with "similar" site category and determine if this report can be relied upon instead. Definition of configuration changes to also be discussed and agreed via an Industry working group.</p>
MYTV	<p>MYTV suggest to have a longer validity period e.g. 3 years since this activity will incur cost. Besides, all transmitting devices are normally coming with manufacturers' declaration on radiation limits which normally based on ICNIRP.</p>
<ul style="list-style-type: none"> • TM • Webe 	<p>The EMF Compliance Declaration should be prepared by the RF Owner.</p> <p>To make the EMF report submission process easier, TM and Webe proposes that one EMF Compliance Declaration can be reused for sites with similar technical specifications.</p> <p>TM and Webe disagree with the proposed 2 years as validity period and proposes the creation of a new EMF Compliance Declaration based only upon configuration changes.</p> <p>EMF Compliance Report must be updated or a new report created each time the Service Provider makes any change or addition to a site which is likely to increase the EMF exposure level above the level in their most recent EMF assessment in any area where the general public may be present when transmissions are taking place.</p> <p>EMF Compliance Declaration shall be deemed valid at all-time unless there are any configuration changes. If there's no configuration change, request for new simulation is only upon request where necessary.</p>

Submitting Party	Comments
U Mobile	<p>U Mobile propose that only one Compliance Declaration is required per site model (for similar sites – refer Annex 1 of this PI Report). Since the same model site will possess similar technical specifications, it will be more efficient and effective to use single EMF Compliance Declaration.</p> <p>However, U Mobile would like to propose that CTO or CNO or HOD to authorized personnel to assign for signature in this aspect.</p> <p>With regards to EMF Compliance Assessment and the EMF Compliance Report submission, U Mobile would like to propose that the reports submission to be based on electronic format to be more environmentally friendly and for better efficiency.</p> <p>Propose to remove the two (2) years validity period for EMF Compliance Declaration and the EMF Compliance Report requirement. Based on the past results (EMF simulation report and on-site testing), even with a 4-share RCI, the EMF reading past result consistently shows below ICNIRP threshold limits.</p> <p>U Mobile is agreeable to submit the EMF Compliance Declaration and the EMF Compliance Report if there are any configuration changes on the RCI. However, the configuration changes need to be defined clearly i.e. for configuration changes due to:</p> <ul style="list-style-type: none"> • Increased number of antennas • Increased number of transmitters <p>Software and hardware (e.g. azimuth and elevation) changes should not be included as part of the configuration changes. These types of configuration changes will affect EMF exposure limits.</p>
YTL	EMF Compliance and Assessment Report should be valid as long as no change in site configuration. YTL proposes that the 2 years validity be deleted.
Asean Saintifik	How do the declaration work? Who going to monitor/audit this declaration, what kind of punishment if found wrong and shall all this define in MS.
<ul style="list-style-type: none"> • Nuklear Malaysia • Cisspr • EdgePoint • Liang Chung Tan 	No comment received

Commission's Final View:

The Commission acknowledged the comments received, however the Commission decided to maintain the requirement for EMF Compliance Declaration for every site.

As for the validity period of the EMF Compliance Declaration, the Commission agreed to lengthen the validity period from two (2) to five (5) years or when the following conditions occurred:

- (a) major changes to the 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.

The Commission decided to amend paragraph 9 to reflect the above.

4.2.2.2

Addendum: Paragraph 11

11. 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 (MTSFB 077)* and the *Technical Code on Prediction and Measurement of RF EMF Exposure from Terrestrial Radio and Television Broadcasting Transmitter Stations (MTSFB 088)*.

Submitting Party	Comments
<ul style="list-style-type: none"> • MYTV • YTL 	Agreed with the proposed addendum.
Celcom	<ul style="list-style-type: none"> • Celcom support MCMC’s proposal to refer to the relevant Technical Code for the details of EMF Compliance Assessment. • Celcom would like to propose that only prediction methods are used for EMF Compliance Assessment. <p>Propose for the following amendment to the “New Paragraph 11”:</p> <p><i>11. The details on prediction methods and on-site measurement <u>EMF Compliance Assessment</u> are described in the <i>Technical Code on Prediction and Measurement of RF EMF Exposure from Base Station (MTSFB 077)</i> and the <i>Technical Code on Prediction and Measurement of RF EMF Exposure from Terrestrial Radio and Television Broadcasting Transmitter Stations (MTSFB 088)</i>.”</i></p>
Digi	Digi have no issue on the assessment details as outlined in the MTSFB Technical Code 077 under section 8, Prediction methods for EMF compliance assessment and section 9, On-site measurement. This is a standard practice that generally used by the industry.
GSMA	<p>GSMA welcomes this change, however, suggests that more flexibility would be provided by simply referring to the latest edition of applicable international standards such as IEC 62232.</p> <p>GSMA notes that the increased use of active antenna systems (MIMO) in both 4G and 5G networks. Measurements¹ and modelling² studies show that the actual maximum time-averaged exposure is much lower than the level that would be predicted based on the theoretical maximum power assuming constant antenna gain and beam direction.</p>

Submitting Party	Comments
	<p>Some national authorities (for example France, Switzerland) have provided for greater accuracy in the evaluation of 5G active antenna systems by the use of reduction factors to account for the effects of changing antenna beams and TDD effects. GSMA notes that the updated version of IEC 62232 (that is currently subject to approval by national committees) describes an approach for RF-EMF compliance assessment based on the actual maximum transmitted power or EIRP. It has been demonstrated that this approach can be applied to 4G or 5G base stations, with or without MIMO antennas.</p> <p>To future-proof the revised Mandatory Standard GSMA proposes to the following sentence to 11.</p> <p>Amendments <i>11. 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 (MTSFB 077) and the Technical Code on Prediction and Measurement of RF EMF Exposure from Terrestrial Radio and Television Broadcasting Transmitter Stations (MTSFB 088). <u>The actual maximum approach described in IEC 62232 or equivalent approaches may be used where appropriate for EMF compliance assessments.</u></i></p>
Maxis	<p>Maxis support the prediction methods and on-site measurements to be based on the MTSFB technical codes. The UK regulator OFCOM for instance regularly conducts random EMF compliance on-site measurements of EMF levels in the vicinity of selected mobile base stations. In 2020, OFCOM carried out EMF measurements at 33 locations in 18 towns and cities across UK. Results of these measurements confirms Maxis' findings whereby EMF levels are always well within the levels identified in the ICNIRP guidelines adopted by MCMC. As explained previously, Maxis however propose that on-site measurement is not to be included in the MS EMF document as a basis for EMF compliance assessment for the service provider since any compliance assessment can be completed using prediction methods. MCMC may nevertheless conduct its own random on-site measurements to verify the EMF simulation reports.</p>
Nuklear Malaysia	<p>The proposed revision mentioned 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 (MTSFB 077) and the Technical Code on Prediction and Measurement of RF EMF Exposure. It is very good that measurement or prediction is clearly clarify in TC document, but how about the technical and specification of the RCI. During the measurement or simulation, there should be a reliable technical document which can be referred to, example; the latest Technical Specification Survey Report (TSSR). This is to ensure that the prediction is accurate and more convincing. This technical data of each RCI is very critical during the simulation as wrong specification of RCI, lead to wrong simulation results. Nuklear Malaysia would suggest that simulation shall be audited by measurement as it is more realistic to demonstrate the EMF level during the compliance assessment.</p>
<ul style="list-style-type: none"> • TM • Webe 	<p>TM and Webe agrees with the proposed revision to define the details of prediction methods and on-site measurement in MTSFB 077 & MTSFB 088.</p>

Submitting Party	Comments
<ul style="list-style-type: none"> • DNB • U Mobile • Ericsson • Cisspr • Asean Saintifik • EdgePoint • Liang Chung Tan 	No comment received

Commission’s Final View:

The Commission acknowledged the comments received.

The industry agreed on the reference to the Technical Code (MTSFB 077 and MTSFB 088) on the Prediction methods and On-site measurement. Thus, the Commission decided to maintain this paragraph as it is.

Service Providers are also required to use the latest technical site information when conducting EMF Compliance Assessment.

4.2.2.3

Addendum: Paragraph 12 (EMF Compliance Report)

12. The EMF Compliance Report as described in the MTSFB 077 and the MTSFB 088 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 two (2) years from the submission of the same to the Commission or when there are any configuration changes on the RCI, whichever comes first.

Submitting Party	Comments
Celcom	<p>a) Current EMF simulation vendors engaged by the Service Provider (“SP”) are recognized by MCMC. The EMF Compliance Report produced by these vendors is reliable and accurate. Celcom opine that the requirement for verification of EMF Compliance Report by another organization appointed by MCMC will introduce another redundant layer that affect efficiency and impose unnecessary additional operation cost. Nevertheless, Celcom understand that the reliability and accuracy of the EMF Compliance Report are very important. In order to address MCMC’s concerns, promote operational efficiency and avoid excessive cost, Celcom would like to propose for MCMC to recognize and accept the EMF Compliance Report that is produced in compliance with the relevant Technical Code i.e. MTSFB 077 and 088 on the following (no third party verification):</p> <ul style="list-style-type: none"> • EMF exposure limit • Assessment method and validation • Tool/ instrument and its calibration (if any) <p>b) Software and hardware alteration involved in regular network optimization activity i.e. antenna elevation/ azimuth, frequency retuning and bandwidth/ RAN changes within the same spectrum</p>

Submitting Party	Comments
	<p>band etc have nominal impact on EMF reading whereby EMF Compliance Report resubmission is not necessary. Hence, Celcom opine that the EMF Compliance Report should valid until major configuration changes is made on the RCI. Major configuration changes is defined as deployment of additional (or fewer) antenna, transmitter or spectrum band on the RCI.</p> <p>Celcom would like to propose for the following amendment to the "New Paragraph 12":</p> <p><i><u>"12. The EMF Compliance Report shall be produced in accordance with the prediction methods for EMF compliance assessment as described in the Section 8 of the MTSFB 077 and the MTSFB 088 shall be verified by the appointed organisation, as duly notified by the Commission, prior to its submission to the Commission. The A new EMF Compliance Report shall be submitted valid up to two (2) years from the submission of the same to the Commission should there be or when there are any major configuration changes on the RCI, whichever comes first. For avoidance of doubt, only the deployment of additional (or fewer) antenna, transmitter or spectrum band on the RCI is considered as major configuration changes on the RCI."</u></i></p>
Digi	<p>Report Verification</p> <p>Digi believe the requirement for verification will introduce another layer that affect efficiency as Digi already have vendors appointed by us who are recognized by the Commission and comply with the Technical Code.</p> <p>Therefore, Digi would like to propose for MCMC to recognize and accept verification from the EMF vendors that produce the simulation report (no 3rd party verification) to promote efficiency and avoid unnecessary delay and cost as long as the vendors have shown compliance with the Technical Code on the following:</p> <ol style="list-style-type: none"> 1. EMF exposure limit 2. Assessment method and validation 3. Tool/instrument and its calibration (if any) <p>Report Validity</p> <p>Digi wish to refer to the response under 4.2.2.1 of this PI Report, which the validity of this EMF Compliance Report shall follow the same as highlighted.</p>
DNB	<p>DNB is of the view that it is not necessary for the EMF Compliance Report to be validated by an appointed organisation because the report is currently being validated by a software that is registered with MCMC, as per the Technical Code MTSFB 077.</p> <p>DNB believe that the outcome of the simulation result by the registered software would be able to fulfil the requirements of compliance assessment.</p>
GSMA	<p>The GSMA is not aware of any technical reason why an EMF compliance report should have a validity limited two years where there are no site changes.</p>

Submitting Party	Comments
	<p>Amendments <i>The requirement for the EMF Compliance Report to be verified by the appointed organization and the <u>period</u> of validity of the report is two (2) years <u>specified by the RF owner</u> from the date of submission to the Commission or when there are any configuration changes on the RCI that are likely to increase the RF-EMF exposure levels in any area in which the public or EMF Trained Personnel may reasonably be present when transmissions are taking place, whichever comes first;</i></p>
Maxis	<p>Based on on-site measurements and simulation reports conducted to-date, the results have consistently produced values well below MCMC's MS EMF and ICNIRP guidelines. Further, EMF exposure does not exceed the MS EMF/ ICNIRP threshold limits even with multiple operators sharing the same site. Maxis propose that any EMF simulation reports produced and submitted by service providers should be considered automatically verified instead of MCMC proposing additional appointed organisation which may add unnecessary red tape. MCMC could however randomly audit any of the report submitted by the service provider. With respect to validity of the EMF reports to be up to 2 years, Maxis propose that if there are no configuration changes, such EMF reports shall be valid beyond 2 years.</p>
MYTV	<p>Compliance report template available in Technical Code.</p>
Nuklear Malaysia	<p>The proposed revision no 12, has mentioned that the EMF Compliance Report shall be valid up to two (2) years from the submission to the Commission or when there are any configuration changes on the RCI, whichever comes first. What is the mechanism used to enforce this?</p> <p>Nuklear Malaysia would suggest that RF compliance is tied up with the permit renewal or any related process so that this validity of 2 years or configuration changes can be monitored. After 2 years, service provider needs to re-assess the compliance and the mechanism of monitoring should be mentioned clearly in the MS document or any related document. This will help the enforcement can be done effectively.</p>
TM	<p>TM is of the opinion that report verification by appointed organization may incur unnecessary costs and bottlenecks.</p> <p>TM proposes only the qualified EMF vendor to do the assessments and is certified by MCMC or other certification agency. This will automatically lead to the production of certified report as per specified in section 8.2.3 of the MTSFB 077 and MTSFB 088. Thus, appointment of the third party for the report verification is no longer imperative. If necessary, MCMC can audit the report on case-by-case basis, and invoke the section 73 of CMA to verify the data accuracy.</p> <p>The validity of the EMF Compliance Report should not be limited to up to 2 years from the submission of the same to the Commission but should be subject to configuration changes on the RCI. The report should be treated valid at all-time unless there is configuration changes to the RCI that is likely to increase the exposure level.</p>

Submitting Party	Comments
U Mobile	<p>U Mobile has no objection with the verification process – but would like to point out that the EMF Simulation report vendor is a vendor that is recognized by MCMC and a verification by a different party would be redundant.</p> <p>Propose to remove the two (2) years validity period for EMF Compliance Declaration and the EMF Compliance Report requirement. Based on the past results (EMF simulation report and on-site testing), even with a 4-share RCI, the EMF reading past result consistently shows below ICNIRP threshold limits.</p>
Webe	<p>Webe is of the opinion that report verification by appointed organization is unnecessary and redundant.</p> <p>Webe proposes only the qualified EMF vendor to do the assessments and is certified by MCMC or other certification agency. This will automatically lead to the production of certified report as per specified in section 8.2.3 of the MTSFB 077 and MTSFB 088. Thus, appointment of the third party for the report verification is no longer imperative. If necessary, MCMC can audit the report on case-by-case basis and invoke the section 73 of Communications and Multimedia Act (“CMA”) to verify the data accuracy.</p> <p>The validity of the EMF Compliance Report should not be limited to up to 2 years from the submission of the same to the Commission but should be subject to configuration changes on the RCI. The report should be treated valid at all-time unless there is configuration changes to the RCI that is likely to increase the exposure level.</p>
YTL	<p>YTL proposes the adoption of 9 models structure type consist of 122 sites in case of site that has similar Technical Specification/ Configuration. EMF Compliance and Declaration Report should be valid as long as there is no change in Configuration.</p> <p>YTL agrees with the rest.</p>
<ul style="list-style-type: none"> • Ericsson • Cisspr • Asean Saintifik • EdgePoint • Liang Chung Tan 	No comment received

Commission’s Final View:

The Commission acknowledged the comments received, however the Commission decided to maintain the requirement of the EMF Compliance Report verification to ensure accuracy and reliability of the report.

As for the validity period of the EMF Compliance Declaration, the Commission agreed to lengthen the validity period from two (2) to five (5) years unless there are any major changes as defined in the amended paragraph 9.

As such, the Commission decided to amend paragraph 12 to reflect the above and to maintain requirement for the report verification.

4.2.2.4

Addendum: Paragraph 13

13. For multiple sites having RCI with similar technical specification(s), 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

Submitting Party	Comments
Celcom	<p>Celcom support MCMC’s proposal to allow the SP to use the same EMF Compliance Report for sites having RCI with similar technical specification to enhance the regulatory requirements for the efficient use of resources. Subsequent to study, analysis and discussions with other relevant SPs, Celcom would like to propose for the EMF Compliance Report to be produced for 122 model sites, covering the following structure type deployed at urban, sub urban and rural areas, with 1 up to 8 sharers scenarios.</p> <p>(For the matrix of 122 similarity model sites, refer Annex 1 of this PI Report.)</p> <p>EMF Compliance Assessment will be performed based on actual sites with highest power, lowest tower height, maximum configuration of spectrum band owned by the relevant SPs sharing the site etc as this will simulate the worst case scenario. The EMF Compliance Report for the 122 model sites can then be used for other sites with similar configuration/ technical specification range in view that the EMF reading for the model site is the maximum reading of its kind. Celcom would like to further discuss with MCMC to finalise this proposal.</p> <p>In view of the above, Celcom would like to propose for the following amendment to the “New Paragraph 13”:</p> <p><i>“13. For multiple sites having RCI with similar technical specification(s)/range(s), 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.”</i></p>
Digi	<p>Digi welcome this approach by the Commission that allowing the replication of the report for those site that have similarity.</p> <p>Report Similarity</p> <p>Digi together with the Industry have developed a similarity model that is made up of a total of 122 models.</p> <p>That is based on the actual site scenario in terms of the site configuration. The table matrix for this is according to the combination of location types, structure types and number of sharers .</p> <p>Digi proposes to perform EMF simulation report using 9 structure types based on MCMC CIMS database. The data tabulated in Annex 1 of this PI Report, Urban + Suburban + Rural will result in producing 50 + 39 + 33 = 122 model sites. The simulation will be done based on actual sites with highest power, lowest tower height, maximum configuration of</p>

Submitting Party	Comments
	<p>spectrum band owned by the relevant service providers sharing the site, etc.</p> <p>(For the matrix of 122 similarity model sites, refer Annex 1 of this PI Report.)</p>
GSMA	The GSMA welcomes new paragraph 13.
Maxis	<p>Based on on-site measurements and simulation reports conducted to-date, the results have consistently produced values well below MCMC's MS EMF and ICNIRP guidelines. Further, EMF exposure does not exceed the MS EMF/ ICNIRP threshold limits even with multiple operators sharing the same site. Maxis are pleased to note that MCMC can see this fact through its proposal to allow multiple sites with similar technical specifications(s) to use the same EMF compliance report. As explained earlier, Maxis believe it would be better to not to mandate Compliance Reports and instead Maxis propose to provide simulation reports on request to demonstrate to MCMC that a specific site is compliant with the EMF exposure limits.</p> <p>Nevertheless, if MCMC believes that EMF compliance reports for selected sites are warranted while considering sites with similar technical specifications, Maxis propose that categorisation of "similar" sites are defined to following the 9 structure types following MCMC's CIMS database while segregating these sites with its location and number of sharers. Based on industry assessment, we identify 122 sites that can represent all the similar sites represent. Maxis propose the location to be segregated as Urban, Sub-urban and Rural. With this categorisation of "similar" sites, one simulation report of an actual site then can be developed for each category. Maxis further propose conservative assessment where the EMF simulation report for the site within each category to be conducted on sites with highest power and maximum spectrum band configurations. Maxis propose that the details of this categorisation to be agreed through an industry Working Group.</p>
MYTV	Compliance report template available in Technical Code.
Nuklear Malaysia	<p>Proposed revision no 13 mention that RCI which has similar technical specification are allowed to use the same EMF compliance report. Nuklear Malaysia would suggest, that all RCI has individual compliance assessment. The reasons are;</p> <ul style="list-style-type: none"> i. Even though the site could have similarity in term of technical specification, the site are located at different location. Different location has different no of population and different traffic rate. The radiofrequency radiation electromagnetic (RF EMF) is very much depending on the traffic usage rate at particular location and time. So, there is no way that RF EMF would be same as the environment for each RCI is different. The best practice is to have individual RF EMF compliance assessment at each RCI. ii. Besides location, population and traffic of user, a very minor of mechanical tilt and electrical tilt of the antenna, would give a very different level of RF EMF. The surrounding structure/building/ earth at every site also different and this also influence the RF EMF level.

Submitting Party	Comments
	<p>iii. The “similar” will make the enforcement become complicated as the criteria of ‘similar’ was not mentioned clearly.</p>
<ul style="list-style-type: none"> • TM • Webe 	<p>TM and Webe support the proposed revision.</p> <p>The revision to allow the Service Provider to use the same EMF Compliance Report (ECR) for multiple sites having RCI with similar technical specifications would help to optimize the resources and simplify the submission process.</p> <p>TM and Webe propose the EMF assessment sampling model by RCI type. The model is categorized by morphology, structure type and number of sharing. The structure type and number of sharing will be based on the data in CIMS. For each category, an EMF simulation report will be created and reused for other sites in the same category.</p> <p>(For the matrix of 122 similarity model sites, refer Annex 1 of this PI Report.)</p>
U Mobile	<p>Agree with MCMC’s view on similar sites. In addition, for ease of execution and clarity, U Mobile would like to propose that the definition of the similarity sites to be based on structure types, number of shares and areas (Urban, sub-urban and rural). Total proposed similar sites are the 122 based on CIMS database.</p> <p>(For the matrix of 122 similarity model sites, refer Annex 1 of this PI Report.)</p>
YTL	<p>YTL proposes the adoption of 9 models structure type consist of 122 sites in case of site that has similar Technical Specification/ Configuration. EMF Compliance and Declaration Report should be valid as long as there is no change in Configuration.</p> <p>YTL agrees with the rest.</p>
Cisspr	<p>Disagree with this addendum.</p> <ul style="list-style-type: none"> • First - This addendum does not define the term “technical specifications” and what it means by “similar”. • Second - No two RCI in different locations will ever be the same, therefore cannot be using the same Compliance Report <p>As “technical specifications”, it is open to interpretation. One such interpretation is referring to it as “hardware or equipment specifications” such as base station and antenna specifications.</p> <p>Electromagnetic fields radiation or exposure is not quantifiable by hardware specifications alone.</p> <p>EMF is very dependent on the environment where the RCI is located. EMF gets absorbed, reflected, and has resonance, and can combine resulting in higher field strength due to trees, buildings, the material the building is built, how it is constructed, distance and angle from the antenna, line of sight, etc.</p>

Submitting Party	Comments
	<p>EMF is also very dependent on its installation, especially direction, the tilt angle, and the height it is installed on site. During commissioning, each antenna direction, tilt angle, and height are adjusted and optimised. It is adjusted point in the direction of the most users, or to avoid obstruction such as building, or to avoid certain location where there may be interference source.</p> <p>EMF is very much dependent on its hardware specifications, as well as the terrain surrounding it and its antenna installation.</p> <p>If we take exactly the same hardware, and install them in two different location with different terrain, the EMF exposure will never be the same.</p> <p>Another factor not taken into consideration is population density (high dense or low dense), type of location (residential or commercial), and distance to the high risk facility (nearest daycare, kindergarten, school or hospital).</p> <p>These are such crucial factors which need to be part and parcel of the so called "technical specifications". If these are not taken into considerations, and clearly not defined, this addendum is very weak, and subject to interpretation.</p>
Asean Saintifik	<p>There is no site are same/similar. A very minor of mechanical tilt of antenna, the result of EMF signal can be very different. Again, an identical site, the way operator controls the amplifier also can be drastically different. Not to mention the surrounding structure/building/earth are different.</p> <p>A simulation for every site shall be a minimum requirement on top with measurement for critical sites.</p>
Liang Chung Tan	<p>Similar site</p> <p>Disagree with similar site and reuse of Compliance Report from another site.</p> <p>The term similar is very subjective. From observations, there will never be any two sites that is "similar". Each site is located in a different housing area, or commercial area, with different building height, structure, material, and has different population density, and with different mix of residential and commercial, and mix of schools, or children playground, and etc.</p> <p>Technical Specification</p> <p>Technical specification is also very subjective (equipment specification such as Power, Type of antenna, Frequency, Bandwidth, Signal to Noise Ratio, etc.)</p> <p>This is definitely cannot be used to say one site is similar to another without taking into consideration its surrounding terrain, and population, and how it was installed.</p> <p>Technical specifications is not good enough, but need to also include, environment, terrain, and installation such as horizontal and vertical</p>

Submitting Party	Comments
	angle of the antenna, where it is pointing towards, and if anything is blocking or any building causing reflection.
<ul style="list-style-type: none"> • DNB • Ericsson • EdgePoint 	No comment received

Commission’s Final View:

The Commission acknowledged the comments received.

The Commission noted the proposed model sites by the Service Providers. In principle the Commission agreed with the concept of having model sites to be used as reference for sites having RCI with similar technical specification(s). However, the finalisation and implementation of model sites are to be further deliberated and discussed for Commission’s approval.

For clarity purposes, the Commission decided to rephrase paragraph 13 to include the environment/surrounding factor.

4.2.2.5

Addendum: Paragraphs 19 to 24 - Submission of EMF Compliance Declaration and EMF Compliance Report

19. The Service Providers shall submit the EMF Compliance Declaration and the EMF Compliance Report to the Commission in accordance with paragraph 22 of this Determination.

20. 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.

21. 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.

22. The EMF Compliance Declaration shall be submitted together with the EMF Compliance Report to the Commission within the following timeline:

- (a) for existing sites, within six (6) 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) weeks before 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 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 23 of this Determination, at least one (1) month before the expiry of the existing EMF Compliance Declaration and/or EMF Compliance Report.

23. The EMF Compliance Declaration and the EMF Compliance Report shall be void if there are any configuration changes on the RCI or has exceeded the validity of two (2) years, whichever comes first. Under such circumstances, a new EMF Compliance Declaration and EMF Compliance Report shall be submitted as specified in paragraph 19 and subparagraph 22(e) of this Determination.

24. 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 configuration changes on the RCI or the EMF Compliance Report has exceeded the two (2) years period from its submission date.

Submitting Party	Comments
Celcom	<p>a) Celcom support MCMC’s proposal for the addition of new Paragraphs 19 - 21.</p> <p>b) Celcom understand the importance of complying with the MS EMF and would like to seek MCMC’s kind indulgence to grant more time for the SP to submit EMF Compliance Declaration and EMF Compliance Report for existing sites (+/- 10,000 sites per SP) due to the following justifications:</p> <ul style="list-style-type: none"> • Aggressive new sites and upgrades rollout including 3G sunset by SPs to meet Jendela targets • Potential network modernization in near future • To identify the RF owner for all the shared sites according to the principles stipulated in Technical Code MTSFB 077

Submitting Party	Comments
	<ul style="list-style-type: none"> • Thereafter, the RF owner to collate data from all sharing parties to conduct EMF Compliance Assessment by relevant EMF simulation vendor <p>c) Celcom opine that the submission timeline of EMF Compliance Declaration and EMF Compliance Report for new site is best to be standardised regardless the site is having or not having similar technical specifications with the existing site to facilitate better management. Two months' timeline would grant sufficient time for the SP to manage and address all the necessary challenges and works.</p> <p>d) Celcom would like to propose that renewal is not required for the EMF Compliance Declaration and EMF Compliance Report that have exceeded the two years period from its submission date. Celcom opine that the EMF Compliance Declaration and EMF Compliance Report should valid until major configuration changes is made on the RCI. Major configuration changes is defined as deployment of additional (or fewer) antenna, transmitter or spectrum band on the RCI. Hence, resubmission is only required when major configuration changes is made on the RCI.</p> <p>e) In addition, it is common for SP to deploy temporary mobile solutions i.e. loose NodeB, mobile BTS, temporary RCI etc to support government/ national events and address urgent request for coverage/ capacity enhancement (normally more than 100 occasions per year). Celcom opine that EMF Compliance Declaration and EMF Compliance Report are not required for these temporary sites that are expected to operate less than 6 months.</p> <p>In view of the above, Celcom propose the following amendment to the "New Paragraphs 22 - 24" and addition of "New Paragraph 25":</p> <p>22. The EMF Compliance Declaration shall be submitted together with the EMF Compliance Report <u>based on the model sites</u> to the Commission within the following timeline:</p> <ul style="list-style-type: none"> a) for existing sites, within six (6) <u>twelve (12)</u> months after this Determination comes into operation; b) for new sites that have <u>or not</u> having similar technical specification(s)/ <u>range(s)</u> with the existing site(s), within two (2) weeks <u>months</u> before <u>after</u> the operation of the new sites; e) 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) (dc) for <u>any major</u> configuration changes on the RCI (<u>such as the deployment of additional (or fewer) antenna, transmitter or spectrum band</u>), 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 23 of this Determination, at least one (1) month before the expiry of the existing EMF Compliance Declaration and/or EMF Compliance Report." <p>"23. The EMF Compliance Declaration and the EMF Compliance Report shall be void if there are <u>any major</u> configuration changes on the RCI or has exceeded the validity of two (2) years, whichever comes first. Under such circumstances, a new EMF Compliance Declaration and</p>

Submitting Party	Comments
	<p>EMF Compliance Report shall be submitted as specified in paragraph 19 and subparagraph 22(eg) of this Determination.”</p> <p>24. 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 <u>any major configuration changes on the RCI (such as the deployment of additional (or fewer) antenna, transmitter or spectrum band) or the EMF Compliance Report has exceeded the two (2) years period from its submission date.</u>”</p> <p>[New Paragraph] <u>“25. The EMF Compliance Declaration and EMF Compliance Report are exempted for temporary site/ RCI expected to operate less than 6 months.”</u></p>
Digi	<p>Declaration process</p> <p>Digi agreeable on the submission process and to propose to have one electronic declaration per similarity model site (total 122 model sites).</p> <p>The proposed electronic declaration shall come from CNO/ CTO/ HOD authorized personnel to sign.</p> <p>Submission Timeline</p> <p>Digi is in the view that a transition period is necessary to allow sufficient time to perform the necessary actions prior to readiness. The main items are to identify the RF owner for shared sites according to the principles stipulated in the Technical Code and the next process to collate data from all sharing parties.</p> <p>Digi have 5,522 existing sites (based on CIMS database) that require to perform the necessary actions mentioned above.</p> <p>Therefore, Digi would like to propose to submit EMF Compliance Report and Declaration based on 122 model sites:</p> <ul style="list-style-type: none"> • Existing sites - within 12 months • New sites (same/ different config) – within 2 months after operation • Major configuration changes - within 2 months after changes • Not required for temporary sites expected to operate less than 6 months. <p>Transitional period</p> <p>There will be significant changes and new requirements expected that need to be assessed and planned for onward implementation. Digi also take into consideration the committed JENDELA aspirations to upgrade more than 21,000 existing base stations as well as build more than 2,600 new sites as an Industry. Since the infrastructure sharing is intensified and network rollout accelerated, including the 3G sunset and site migration to 4G in 2021, heavy activities on sites and the site configurations are likely to vary within the period of 2021-2022.</p> <p>Digi would like to request for a transitional period prior to the revised EMF standards being imposed by Commission. The transitional period will take into consideration the above-mentioned impact within Digi network in 2021 and 2022 and hence Digi would like to propose for a 12 months</p>

Submitting Party	Comments
	transitional period to address the variations expected in the network in during this period.
DNB	<p>No comment for paragraphs 19, 20, 21, 23 and 24.</p> <p><u>Paragraph 22</u></p> <ul style="list-style-type: none"> • For timeline under 22 (b), (c) and (d), DNB proposes to extend the timeline of submission to 6 months, to be similar to timeline in 22 (a). Different timelines will be onerous to the Service Providers and may result in Service Providers inadvertently missing out on the relevant submissions. • Standardizing the timeline will provide more predictability and allow the Service Providers to plan their submissions more systematically. • DNB also suggest removing the renewal of the EMF Compliance report (under 22 (e)) since 2 years validity of EMF report due to RF and EMF conditions will remain unchanged if there is no change in site configuration. • DNB also seeks for clarity on the criteria and simulation standard for sites having similar technical specifications.
GSMA	<p>The GSMA supports the requirement to submit the EMF Compliance Declaration. The GSMA recommends that the EMF Compliance Report is available on request by the Commission.</p> <p>Amendments</p> <p>The addition of new paragraphs on the requirements regarding Submission of EMF Compliance Declaration and EMF Compliance Report are as follows:</p> <ol style="list-style-type: none"> a) EMF Compliance Declaration and EMF Compliance Report shall be submitted to the Commission <u>and the EMF Compliance Report that support the EMF Compliance Certificate made available to the Commission on request;</u> b) EMF Compliance Declaration and EMF Compliance Report shall be submitted within the specified timeline; c) the validity period of EMF Compliance Declaration and EMF Compliance Report are specified <u>by the RF owner;</u> and d) service providers shall publish and maintain the EMF Compliance Declaration and the EMF Compliance Report in their geospatial mapping website, <u>noting that information posted on the site should not be commercially sensitive, or on request.</u> <p>Validity period</p> <p>The GSMA is not aware of any technical reason why an EMF compliance report should have a validity limited two years where there are no site changes.</p>

Submitting Party	Comments
	<p><u>Paragraph 23</u></p> <p>Amendments</p> <p><i>23. The EMF Compliance Declaration and the EMF Compliance Report shall be void if there are any configuration changes on the RCI <u>that are likely to increase the RF-EMF exposure levels in any area in which the public or EMF Trained Personnel may reasonably be present when transmissions are taking place or has exceeded the validity of two (2) years specified by the RF owner, whichever comes first. Under such circumstances, a new EMF Compliance Declaration and EMF Compliance Report shall be submitted as specified in paragraph 19 and subparagraph 22(e) of this Determination with a supporting EMF Compliance Report available on request.</u></i></p>
Maxis	<p><u>Paragraph 19</u></p> <p>Based on on-site measurements and simulation reports conducted to-date, the results have consistently produced values well below MCMC’s MS EMF and ICNIRP guidelines. Further, EMF exposure do not exceed the MS EMF/ ICNIRP threshold limits even with multiple operators sharing the same site. We are pleased to note that MCMC can see this fact through its proposal to allow multiple sites with similar technical specifications(s) to use the same EMF compliance report. As explained earlier, we believe it would be better to not to mandate Compliance reports and instead we propose to provide simulation reports on request to demonstrate to MCMC that a specific site is compliant with the EMF exposure limits. Further, Maxis request MCMC to reconsider the requirement for service providers to submit EMF compliance declarations for each site.</p> <p>Maxis however propose to provide a general EMF compliance declaration at network level based on their internal assessments on best installation practice while ensuring mobile phone base stations comply with prescribed technical specifications, such as emission power of mobile base stations including relying on information gathered from simulation reports conducted to-date which shows the results have consistently produced values well below MCMC’s MS EMF and ICNIRP guidelines.</p> <p>Nevertheless, if MCMC believes that EMF compliance reports for selected sites are warranted while considering sites with similar technical specifications, we propose that categorisation of “similar” sites are defined to following the 9 structure types following MCMC’s CIMS database while segregating these sites with its location and number of sharers. We propose the location to be segregated as Urban, Sub-urban and Rural. With this categorisation of “similar” sites, one simulation report of an actual site then can be developed for each category. We further propose conservative assessment where the EMF simulation report for the site within each category to be conducted on sites with highest power and maximum spectrum band configurations. The details of this categorisation to be agreed through an industry Working Group.</p> <p><u>Paragraph 20</u></p> <p>Maxis agree that EMF declaration and/or compliance reports submitted will be accurate to the best of their knowledge. Nevertheless, Maxis request MCMC to a proportionate and take pragmatic approach to compliance and enforcement. The results of on-site measurements and</p>

Submitting Party	Comments
	<p>simulation reports conducted to-date have consistently produced values well below MCMC’s MS EMF and ICNIRP guidelines. Also, EMF exposure does not exceed the MS EMF/ ICNIRP threshold limits even with multiple operators sharing the same site. For example, based on historical EMF measurements show that EMF exposure in terms of percentage power density relative to MCMC’s maximum allowed limit range from 0.0953% to 2.3660%. In another example, UK telecoms regulator OFCOM in 2020 carried out EMF measurements at 33 locations near to 5G mobile phone base stations in 18 towns. Such measurements showed that highest all band average exposure levels ranged between 0.04% to 7.1% while the second highest level was only 1.5%. The highest level observed in 5G band used was just 0.23%</p> <p><u>Paragraph 21</u></p> <p>Maxis agree to remedy any EMF exposure level found to exceed EMF exposure limit specified in Table 1.</p> <p><u>Paragraph 22</u></p> <p>Considering that Maxis propose that a general EMF compliance declaration can be submitted once every 2 years based on network and not on a site basis. Maxis will ensure that any RFI configuration changes made are always within the threshold of MS EMF exposure limit. In the event MCMC proceeds with requirements for compliance reports using simulation reports for sites with similar technical specifications (122 model sites as proposed above), Maxis propose the following timelines for submission of such reports provided there are no additional approval/verification from MCMC needed in this process:</p> <ul style="list-style-type: none"> • Existing Sites: Within 12 months after MS EMF coming into effect. • New Sites: Within 3 months after operation of sites • Configuration changes: within 3 months after such changes are made. <p>Maxis is proposing the revised timelines above considering huge number of sites including shared sites. Maxis are proposing the above requirements are excluded for temporary sites that operate for less than 6 months.</p> <p>Maxis proposed that definition of “configuration changes” to be defined when antennas, transmitters, or spectrum bands are added to the site. Software and hardware alteration involve in network optimization activity such as azimuth, elevation etc., should not be considered configuration changes. When such configuration changes are made, Maxis proposed that we assess existing simulation report for a site with “similar” site category and determine if this report can be relied upon instead. Maxis propose that definition of configuration changes to also be discussed and agreed via an Industry working group.</p> <p><u>Paragraph 23</u></p> <p>If MCMC believes that EMF compliance reports for selected sites are warranted while considering sites with similar technical specifications, we propose that definition of configuration changes to be defined as only for major changes when antennas, transmitters, or spectrum band are added to the site. Software and certain hardware alteration involved in</p>

Submitting Party	Comments
	<p>network optimization or maintenance activity such as azimuth, elevation etc., should not be considered configuration changes. We propose that this definition to also be discussed and agreed via an industry Working group. So long as there are not configuration changes per the definition proposed above, we propose that these report's validity to be indefinite and not limited to 2 years. Otherwise, this will create unnecessary administrative burden. If MCMC agrees to a general EMF compliance declaration at a network level, and not on a site basis, we may submit such general declaration every 2 years. Maxis will ensure that any RCI configuration changes made are always within the threshold of MS EMF exposure limit.</p> <p><u>Paragraph 24</u></p> <p>When installing our sites, we take into consideration EMF compliance of these sites. If MCMC proceeds with requirements for compliance declaration, we propose that a general EMF compliance declaration to be sufficient and valid for 2 years for our network and not on a site basis. We further propose that MCMC to allow EMF simulation reports submitted earlier considering that the sites have not gone through major configuration changes to be defined and agreed at the industry working group</p>
<ul style="list-style-type: none"> • TM • Webe 	<p><u>Paragraph 19</u></p> <p>Agreed as per described in TM's and Webe's overall view.</p> <p>For sites that required submission of EMF Compliance Declaration and EMF Compliance Report, TM and Webe in view that the reasonable timeline should be given to the RF Owners. With regards to that, TM and Webe proposes the reasonable timeline as per paragraph 22 in this response.</p> <p>RF Owners shall submit the EMF Compliance Declaration and EMF Compliance Report with the TM's and Webe's proposed revision to the paragraph 22 in this response.</p> <p>This is to allow sufficient timeline for the Service Providers to prepare the necessary requirement timely.</p> <p><u>Paragraphs 20 - 21</u></p> <p>Agreed as per proposed revision.</p> <p><u>Paragraph 22</u></p> <p>TM and Webe propose revision to the timeline to ensure sufficient time to prepare the required requirements:</p> <ul style="list-style-type: none"> (a) 18 months after new MS EMF takes effect; (b) for new sites having similar technical specification(s) with the existing site(s), within 1 month after the operation; (c) agree but subject to reasonable number of sites (i.e. max 100 sites) that require EMF Compliance Report submission at one particular time; (d) agree but subject to reasonable number of sites (i.e. max 100 sites) that require EMF Compliance Report submission at one time;

Submitting Party	Comments
	<p>(e) TM and Webe propose to remove this addendum, in line with TM's and Webe's recommendation in paragraph 9 in this response.</p> <p><u>Paragraph 23</u></p> <p>TM and Webe agree with EMF Compliance Report shall be void only if there are any configuration changes on the RCI.</p> <p>TM and Webe propose to remove the 2 years' validity period, and whichever comes first since the report should be deemed valid at all-time unless there is configuration changes to the RCI. This is in line with TM's and Webe's recommendation in paragraph 9 in this response.</p> <p><u>Paragraph 24</u></p> <p>TM and Webe agree the EMF Compliance Declaration is exempted for the sites that had already submitted the EMF Compliance Report before this.</p> <p>In accordance with TM's and Webe's recommendation in paragraph 9, TM and Webe propose to remove the requirement to submit the EMF Compliance Declaration for EMF Compliance Reports that are more than two (2) years old. Unless the RCI configuration changes, the report should be considered valid at all times.</p>
U Mobile	<p><u>Paragraphs 20 - 21</u></p> <p>No further comment.</p> <p><u>Paragraphs 19 and 22</u></p> <p>a) We propose that the timeline be between 9-12 months after this Determination comes into effect. b) We proposed two (2) months after the operation of the new sites. c) Propose two months after the operation of the new sites. d) Propose two (2) months after the said changes.</p> <p>Justification for Paragraph #22 (a), (b), (c) and (d) of this Determination: EMF Simulation report needs intense coordination and it involves reviewing complex databases among service providers. In addition, the above proposed submission timeframe also takes into account the existing number of service providers involved in the joint EMF simulation report scenario and we foresee more service providers will participate in this joint effort in the future.</p> <p>(e) Proposed to delete this sentence. Details are to be referred to Paragraph #23 of revised MS EMF.</p> <p><u>Paragraphs 23 - 24</u></p> <p>Propose to remove the two (2) years validity period for EMF Compliance Declaration and the EMF Compliance Report requirement. Based on the past result (EMF simulation report and on-site testing), even with 4-share RCI, the EMF reading past result consistently shown below the ICNIRP threshold limit.</p>

Submitting Party	Comments
	<p>U Mobile is agreeable to submit EMF Compliance Declaration and the EMF Compliance Report if there are any configuration changes on the RCI. However, the configuration changes need to be defined clearly.</p> <p>Below is the proposed definition of configuration changes:</p> <ul style="list-style-type: none"> • Increased number of antennas • Increased number of transmitters <p>Software and hardware (e.g. azimuth and elevation) changes should not be included as part of the configuration changes. These types of configuration changes do not affect the EMF exposure limit.</p>
YTL	<p><u>Paragraphs 19 - 21</u></p> <p>No objection from YTL</p> <p><u>Paragraphs 22 - 24</u></p> <p>22 (a) – YTL proposes the period of one year with adoption of 9 model report. Otherwise, more time is needed.</p> <p>22 (b) – The timeline is fine with the adoption of 9 model similarities. Otherwise proposes to be 3 months.</p> <p>22 (c) – The timeline is fine with the adoption of 9 model similarities. Otherwise proposes to be 3 months.</p> <p>YTL proposes the EMF Compliance and Declaration Report should be valid as long as there is no change in site configuration. The EMF reading will not change over time except when there is a change in site configuration.</p> <p>Hence, should be no expiry date of the EMF compliance of the EMF Compliance declaration unless there is a change in the configuration. Reference to expiry period of 2 years should be deleted.</p> <p>YTL agrees with the rest.</p>
Cisspr	<p>No comment for paragraphs 19, 20, 21, 23 and 24.</p> <p>Disagreed with addendum for paragraph 22 (b)</p> <ul style="list-style-type: none"> • First - This addendum does not define the term “technical specifications” and what it means by “similar”. (refer to Cisspr’s comment in 4.2.2.4 of this PI Report) • Second - This addendum is not clear in this definition of two weeks “before operation of new site”. <p>Every RCI after installation, will go through a period of commissioning, optimization and fine tuning, where drive test for signal quality is performed, and coverage is determined. During this period, antenna height, direction, tilt angle, and power level are adjusted to maximise coverage, signal quality, and minimise interference or to avoid obstruction such as building or trees, etc.</p>

Submitting Party	Comments
	So, defining “two weeks before operation of new site” is not right. It has to also define that it has to be after “completion of commissioning, optimization, fine tuning, and signal quality tests.”
<ul style="list-style-type: none"> • MYTV • Nuklear Malaysia • Ericsson • Asean Saintifik • EdgePoint • Liang Chung Tan 	No comment received

Commission’s Final View:

The Commission acknowledges the comments received.

The Commission decided to maintain the requirement for EMF Compliance Declaration for every site.

The Commission agreed to revise the timeline for submission of the EMF Compliance Declaration and EMF Compliance Report to provide ample time for Service Providers to comply with the revised MS EMF as follows:

- (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 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 23 of this Determination, at least two (2) months before the expiry of the existing EMF Compliance Declaration and/or EMF Compliance Report.*

4.2.2.6

Addendum: Paragraph 25

25. The Service Providers shall publish and maintain the EMF Compliance Declaration and the EMF Compliance Report in the Service Providers' geospatial mapping website containing the EMF exposure level information that is accessible by the public or any interested parties.

Submitting Party	Comments
Celcom	<p>a) Celcom understand MCMC's intention of allowing the public to know the EMF information of a particular site. All EMF Compliance Reports generated to-date show full compliance with the EMF exposure limit set by the MCMC and ICNIRP. The results/ EMF readings have consistently produced values well below MCMC's MS EMF and ICNIRP guideline. Hence, Celcom opine that a general compliance declaration for all sites at the SP's official website is sufficient to meet the objective.</p> <p>b) Celcom is deeply concerned that someone with bad intention may misuse/ abuse the information if Celcom publish and plot the site location on a geospatial mapping website (i.e. sabotage, vandalism etc.). Hence, Celcom would like to seek MCMC's kind understanding in not requesting for the plotting of site location in map that is accessible by the public due to confidentiality.</p> <p>c) It is not a common global practice and no Regulator in the developing countries that imposes mandatory requirement on publishing and maintaining the EMF Compliance Declaration and EMF Compliance Report in the SP's geospatial mapping website. The geospatial mapping website will impose unnecessary increased regulatory cost whereby we are unclear whether there would be enough usage by the public to justify for the development of the geospatial mapping website.</p> <p>In view of the above, Celcom would like to propose for the following amendment to the "New Paragraph 25":</p> <p><i>25. The Service Providers shall publish and maintain the <u>a general EMF Compliance Declaration and the EMF Compliance Report in the Service Providers' geospatial mapping official website containing stating that all its sites comply with the EMF exposure limit stated in the MS EMF level information that is accessible by the public or any interested parties.</u></i></p>
Digi	<p>Introducing a geospatial mapping website may lead to undesirable attention from various populist and alternative groups with views not based on science with the risk of creating misinforming media which could damage the public perception and industry.</p> <p>As such, Digi propose to have general declaration at respective Telco official website for all sites.</p>
DNB	<p>DNB notes the new requirement for Service Providers to publish the EMF Compliance Declaration and the EMF Compliance Report in the geospatial mapping website.</p>

Submitting Party	Comments
	<p>DNB do not consider it necessary to publish the information on this website as the report may contain sensitive information that could create an increased threat to the critical national infrastructure.</p> <p>Instead, DNB suggests for the EMF Compliance Declaration and the EMF Compliance Report to be submitted to MCMC. MCMC could then decide to publish the information if required.</p> <p>DNB recommend that Service Providers and MCMC to jointly discuss and develop a set of criteria which will determine the suitability to publish the information.</p>
GSMA	<p>The requirement to operate and maintain a website with geospatial mapping site with EMF information is not justified. It is unclear whether there would be enough usage by members of the public to justify the development of such a site. It is also unclear that the public would understand the information in the EMF Compliance Report.</p> <p>The MCMC could consider developing such a site using provided information provided in the EMF Compliance Declaration. However, GSMA is not aware of independent evidence that confirms the value of providing public information on individual site EMF compliance distances.</p> <p>Furthermore, GSMA notes that some countries are concerned about the potential threat to antenna sites in making site location data publicly available. Some information may also be commercial sensitive and GSMA recommends that the revised Mandatory Standard contain a statement '<i>Information posted on the site should not be commercially sensitive.</i>'</p> <p>Amendments <i>Service providers shall publish and maintain the EMF Compliance Declaration and the EMF Compliance Report in their geospatial mapping website, <u>noting that information posted on the site should not be commercially sensitive, or on request.</u></i></p>
Maxis	<p>Based on on-site measurements and simulation reports conducted to-date, the results have consistently produced values well below MCMC's MS EMF and ICNIRP guidelines. Further, EMF exposure does not exceed the MS EMF/ ICNIRP threshold limits at publicly accessible areas even with multiple operators sharing the same site. In the UK for example, the government has raised significant concerns about the release of information on the location of mobile phone base stations which would create an increased threat to the critical national infrastructure and has advised OFCOM that such disclosure would adversely affect national security. OFCOM on this basis has subsequently decided against release of such information to the public. Therefore, we request that MCMC remove the requirements for service providers to publish and maintain EMF compliance declarations and reports in a geospatial mapping website. With this, we also propose that contact details regarding information on EMF are also not required.</p> <p>Service providers however can publish a general declaration at respective company website stating compliance to EMF exposure limits. As an added information, such website can indicate the best practices employed in the installation of RF equipment to ensure ongoing compliance. We propose however that MCMC may conduct its own</p>

Submitting Party	Comments
	regular EMF measurements at randomly selected base station sites across the country and publish such results at MCMC's website.
<ul style="list-style-type: none"> • TM • Webe 	<p>TM and Webe disagrees with the proposed revision.</p> <p>TM and Webe are of the view that additional investment is needed to be spend by the SP to develop such website and there is potential risks of data being abused by unauthorized parties if the data made public.</p> <p>Taking into account that CIMS currently stored all Service Providers' Mobile Network technical data, TM and Webe believe that the present CIMS can be enhanced to generate all Service Providers' EMF exposure level information via geospatial mapping website overseen by MCMC.</p>
U Mobile	Propose to have a general declaration to be published on the service provider's official website for all existing on-air sites. Thus, the public will have easy and direct access to EMF exposure information.
YTL	<p>YTL believes that including EMF report in the geospatial mapping will not service any useful purpose. Much of the public is not well versed in EMF issues and may misinterpret the report.</p> <p>The reports are best kept by MCMC for reference.</p>
<ul style="list-style-type: none"> • MYTV • Nuklear Malaysia • Ericsson • Cisspr • Asean Saintifik • EdgePoint • Liang Chung Tan 	No comment received

Commission's Final View:

The Commission acknowledged the comments received.

The Commission noted that majority of the respondents disagreed with the proposed requirement to publish and maintain the EMF Compliance Declaration and the EMF Compliance Report in the Service Providers' geospatial mapping website.

After reviewing all the comments, the Commission decided to amend the paragraph by removing the requirement to publish in geospatial mapping website. However, in the interest of public, the EMF Compliance Declaration need to be published in the Service Provider's official website.

The Commission decided to amend paragraph 25 to reflect the above.

4.2.2.7

Addendum: Paragraph 26

26. The Service Providers shall ensure provision of proper precautionary and preventive measures for protection of the public and workers, from exposure to EMF.

Submitting Party	Comments
<ul style="list-style-type: none"> • Digi • MYTV • YTL • U Mobile 	<p>Agreed with the proposed addendum.</p>
<p>Celcom</p>	<p>Same comments and recommendation as stated under signages; and precautionary and safety preventive measures.</p> <p>Celcom would like to propose to delete the newly proposed “Paragraph 26”.</p>
<p>DNB</p>	<p>DNB seeks for clarity on the precautionary and safety preventive measures which would be acceptable to MCMC. This could be well documented in MCMC Guidelines which should be updated after the effective date of this Mandatory Standard.</p>
<p>GSMA</p>	<p>GSMA welcomes the Addendum and proposes modified wording for clarity.</p> <p>Amendments <i>26. The Service Providers shall ensure provision of proper precautionary and preventive measures for protection of the public and workers, from exposure to EMF <u>above applicable limits.</u></i></p>
<p>Maxis</p>	<p>Maxis is agreeable where service providers are to ensure provision of proper precautionary and preventive measures for protection of the public and workers. Based on on-site measurements and simulation reports conducted to-date, the results have consistently produced values well below MCMC’s MS EMF and ICNIRP guidelines. Further, EMF exposure does not exceed the MS EMF/ ICNIRP threshold limits at publicly accessible areas even with multiple operators sharing the same site.</p> <p>As such, on the implementation of displaying warning signs, we propose that it should not be a mandatory requirement especially in areas where gates, barriers and/or locks are installed to prevent the public from accessing such area.</p>
<ul style="list-style-type: none"> • TM • Webe 	<p>Past studies via research collaborations with credible institutions and measurements by MCMC had resulted with EMF readings of the radio transmitter station were well below permitted exposure limit and will not cause harm to the general public.</p> <p>Every Service Providers operation radio equipment should have in place the EMF trainings, awareness programs, periodical medical surveillance for workers working in EMF exposed environment.</p>

Submitting Party	Comments
<ul style="list-style-type: none"> • Nuklear Malaysia • Ericsson • Cisspr • Asean Saintifik • EdgePoint • Liang Chung Tan 	No comment received

Commission's Final View:

The Commission acknowledged the comments received.

The Commission decided to maintain the paragraph as the safety and protection of the workers and general public cannot be compromised, however the Commission also agreed to modify the paragraph for clarity on exposure to EMF by adding the phrase "above applicable limits".

4.2.2.8

Addendum: Paragraph 28

28. For sites using millimetre wave (mm Wave) transmitter(s), the size for signage should be of appropriate size.

Submitting Party	Comments
Digi	Agreed with the proposed addendum.
Celcom	<p>Site densification/ small cell is required for 5G deployment whereby there will be many 5G sites surrounding the community especially those sites that are using mmWave. It is impractical to place signage as it will create unnecessary fear and impact the aesthetic.</p> <p>(refer to Celcom's comment in 4.2.1.6 of this PI Report regarding signages under paragraph 27 of revised MS EMF).</p> <p>In view of the above, Celcom would like to propose to delete the newly proposed "Paragraph 28".</p>
DNB	<p>The mmWave 28GHz will be used in a targeted manner for network densification and to support enterprise verticals. The deployment of 28GHz will mainly be in the form of small cell on street furniture.</p> <p>DNB will be able to determine the appropriate signage size for mmWave transmitters based on the deployment scenarios for 5G mmWave network.</p>
MYTV	Millimeter wave frequency range is 30GHz to 300GHz (agreeable – frequency range not relevant with DTT).
YTL	<p>YTL has no objection.</p> <p>However, placing of signage can cause alarm amongst the public. Many towers, such as lamp pole structures, are along walkways. The placing</p>

Submitting Party	Comments
	<p>of signage could cause public opposition towards placing of towers in such places event though they are absolutely safe.</p> <p>Rather than placing signage on EMF, YTL suggests signage that the structure is safe be put.</p>
<ul style="list-style-type: none"> • Maxis • U Mobile • TM • Webe • Nuklear Malaysia • GSMA • Ericsson • Cisspr • Asean Saintifik • EdgePoint • Liang Chung Tan 	<p>No comment received</p>

Commission’s Final View:

The Commission acknowledged the comments received.

The Commission decided to maintain the paragraph as the safety and protection of the workers and general public cannot be compromised.

4.2.2.9

Addendum: Paragraph 29

29. The following additional information shall be made available at the site for the public:
- (a) up to date Service Providers’ contact details regarding information on EMF; or
 - (b) place or source of information such as the Service Providers’ geospatial mapping website as referred to in paragraph 25 of this Determination.

Submitting Party	Comments
<p>Celcom</p>	<p>We understand MCMC’s intention to request SP to provide information to the public on EMF matters. We opine that the information on SP’s contact details and general declaration on EMF compliance could be published at SP’s official website.</p> <p>Propose for the following amendment to the “New Paragraph 29”:</p> <p><i>29. <u>The following additional information up to date Service Provider’s contact details shall be made available at the Service Provider’s official website site for the public to seek information on EMF:</u></i></p> <p>(a) up to date Service Providers’ contact details regarding information on EMF; or</p>

Submitting Party	Comments
	(b) place or source of information such as the Service Providers' geospatial mapping website as referred to in paragraph 25 of this Determination."
Digi	In line with response in Paragraph 25 of revised MS EMF, such information shall be made available at respective official website including the contact detail. The public can ask directly if they are interested to know the EMF reading for certain site.
Maxis	Refer to Maxis's comment in 4.2.2.6 of this PI Report.
<ul style="list-style-type: none"> • TM • Webe 	<p>TM and Webe disagree, in line with the TM and Webe recommendation for paragraph 25.</p> <p>TM and Webe are of the view that the EMF exposure from their base station are within exposure limit and safe for the public. Any health complaints with regards to the EMF exposure is suggested to be reported to MCMC or local authorities, accompanied with verified proof from certified medical practitioners as per adopted by Penang State Government.</p> <p>Members of the public can refer to MCMC's EMF website: http://rfemf.mcmc.gov.my/home for information and guidelines on RF EMF.</p> <p>The general public also can access the simulation and RF test reports at http://mycomms.skmm.gov.my which is an information mapping tool intended to share information on EMF, RF, and Wi-Fi coverage across Malaysia.</p>
U Mobile	<p>29 (a). U Mobile proposes to remove this requirement as generally, the general public is discouraged to go near the base station due to security and safety concerns.</p> <p>29 (b). Agreed. Propose to have a general declaration to be published on the service provider's official website for all existing on-air sites. Thus, the public will have easy and direct access to EMF exposure information.</p>
YTL	YTL suggests that a reference be made to MCMC instead as MCMS as the Regulator is more authoritative of EMF matters.
<ul style="list-style-type: none"> • DNB • MYTV • Nuklear Malaysia • GSMA • Ericsson • Cisspr • Asean Saintifik • EdgePoint • Liang Chung Tan 	No comment received

Commission’s Final View:

The Commission acknowledged the comments received.

The Commission decided to remove paragraph 29, however the information on EMF shall be made available to the public as indicated in paragraph 25.

<p>4.2.2.10</p> <p>Addendum: Paragraph 30</p> <p>30. The Service Providers/site owners shall ensure only EMF Trained Personnel are allowed into the site.</p>

Submitting Party	Comments
YTL	YTL is agreeable to item 30.
<ul style="list-style-type: none"> • TM • Webe 	<p>Agreed as per proposed revision</p> <p>Agreed that only EMF trained personnel are allowed to enter radio transmitter stations as occupationally-exposed individuals are operating under controlled conditions and being informed about the risk associated with NIR exposure for their specific situation and how to reduce these risks. Every Service Provider operation radio equipment should have in place the EMF training awareness programs, periodical medical surveillance for workers working in EMF exposed environment.</p>
Celcom	<p>Celcom would like to propose that untrained personnel may still enter the site to work on non-RF activities. EMF Trained Personnel is only required for zones above EMF exposure limit such as areas nearby antenna/transmitter. Telecommunication workers that have been briefed on the occupational safety/ potential radiation exposure by respective company will be considered as EMF Trained Personnel.</p> <p>Propose for the following amendment to the “New Paragraph 30”:</p> <p><i>30. The Service Providers/site owners shall ensure only EMF Trained Personnel are allowed into the site <u>to conduct works at areas nearby the antenna/ transmitters.</u></i></p>
Digi	<p>EMF Trained Personnel</p> <p>Digi agree with the underlying principle on this subject, however clear demarcation should be considered for RF and non-RF activities.</p> <p>Digi would like to propose that untrained personnel may still enter the site to work on non-RF related activities.</p> <p>The EMF Trained Personnel is only required for zones above EMF exposure limit. Service Providers should ensure that the briefing on EMF exposure is done during regular safety briefing session.</p>

Submitting Party	Comments
DNB	DNB would need further clarification on the scope and requirement of the EMF training which is compulsory for personnel to access the site.
GSMA	<p>GSMA welcomes the Addendum and proposes modified wording for clarity.</p> <p>Amendments 30. <i>The Service Providers/site owners shall ensure only EMF Trained Personnel are allowed into to access areas of the site above the public limits.</i></p>
Maxis	Maxis will ensure that we have in place appropriate arrangements including training for staff to protect workers from exposure to excessive EMF. As such we agree that only trained personnel are allowed into site when they working an area where radio communications infrastructure may produce exposure exceeding the public EMF limit. It is important to observe that EMF untrained personnel may still be required to enter the site to work on non-RF activities work such as in fiber, power supply, security system, lighting, field and perimeter fence maintenance.
U Mobile	This should apply only when EMF exposure level is over the safety threshold limit. Normally there should be no requirement to limit only trained EMF personnel to be allowed to enter the site premises (especially if the EMF exposure level is below MCMC EMF threshold limit).
<ul style="list-style-type: none"> • MYTV • Nuklear Malaysia • Ericsson • Cisspr • Asean Saintifik • EdgePoint • Liang Chung Tan 	No comment received

Commission’s Final View:

The Commission acknowledged on the comments received.

The Commission decided to amend the paragraph to ensure only EMF Trained Personnel or person accompanied by the EMF Trained Personnel are allowed into the site.

The Commission agreed to modify the paragraph for clarity on the site by adding the phrase “access areas of the site above the general public limits”.

4.2.3

QUESTION 4: THE COMMISSION SEEK VIEWS ON THE PROPOSED DELETION OF PARAGRAPHS FROM THE EXISTING MANDATORY STANDARD FOR ELECTROMAGNETIC FIELD EMISSION FROM RADIOCOMMUNICATIONS INFRASTRUCTURE AS STATED IN TABLE 1.

4.2.3.1

Deletion: Paragraphs 23 to 26 of existing MS EMF

Exclusion Zones Calculation

- A. Single Antennas or Sectoral Antenna at Single Pole
- B. Multiple antennas site

Signages

- A. Exclusion Zones and Implementation of Signage

Submitting Party	Comments
<ul style="list-style-type: none">• Celcom• Digi• Maxis• MYTV• TM• U Mobile• Webe• YTL• GSMA	Support and agreed with the proposed deletion
<ul style="list-style-type: none">• DNB• Nuklear Malaysia• Ericsson• Cisspr• Asean Saintifik• EdgePoint• Liang Chung Tan	No comment received

Commission's Final View:

The Commission acknowledged the comments received.

Generally, all submitting parties supported and agreed to delete paragraphs 23, 24, 25 and 26 of existing MS EMF. As such, the Commission decided to maintain with the deletion of paragraphs 23, 24, 25 and 26.

4.2.4 Additional comments received:

Submitting Party	Comments
Webe	<p>MCMC also may perform periodical EMF measurement and audit to ensure compliance by the industry.</p> <p>Advocacy/awareness program</p> <p>Webe trust that more efforts and collaborative activities between industry, universities and research institutions should be made on EMF advocacy/awareness programs to educate and correct misperception by the general public.</p>
Cisspr	<p>On-going on-site measurement audit that is missing</p> <p>As with anything to do with Safety, and especially safety to the general population, there is always a need for continuous monitoring with on-going On-site Measurement Audit.</p> <p>MS EMF has no paragraph specifying how important it is to conduct on-site measurement audits, especially at high density and areas with high risk population.</p> <p>During the submission to MCMC of every new site, Cisspr propose that a schedule with defined time table and dates of audit should be presented to MCMC, and on MCMC side, prior to site being approved, this ongoing audit schedule needs to be received from Service Provider and kept in record.</p> <p>This schedule forces Service Provide to commit to when the audit will be done before hand, so that they are able to prepare the necessary budget for these to be done. Else budget can be a problem.</p> <p>It also provide a much more structured manner for MCMC to check and audit if the Service Provider meets their committed audit schedule or not.</p>
Liang Chung Tan	<p>Availability of Measurement Report and Audit Data to the public</p> <p>This is missing from here. If I see a tower near my house, I will want to easily go to a website to check the measurement report, and see if MCMC has conducted testing at a location maybe in front of my house, or along the road I live in. I also like to know who owns the tower, and what frequency it is radiating, and whether it is Celcom, or Maxis, etc. I also like to know who I can complain to if I need to complain.</p> <p>Also, very important is when it was last measured - 1 month ago, 1 year ago, or 10 years ago? I expect that telco will make upgrade and changes from time to time, and there will be measurement done.</p> <p>This is missing. I want to be reassured that all this is done so I and my neighbours all feel safe.</p>

Commission's Final view:

The Commission acknowledged the comments received. However, general comments on administrative procedure for implementation of MS EMF would not be addressed in the PI report and to be taken into consideration by MCMC for future initiative on EMF matters.

5. THE WAY FORWARD

- 5.1 MCMC is of the view that the proposed revision of the MS EMF is needed to ensure efficient implementation of MS EMF by the relevant stakeholders.
- 5.2 MCMC intends to consider all the general views and proposed approaches, from respondents to enhance the monitoring and to strengthen enforcement of the revised MS EMF.
- 5.3 The revised MS EMF will take effect starting 1 November 2021 and the existing MS EMF will be revoked.

ANNEX 1

THE MATRIX OF 122 SIMILARITY MODEL SITES

Area: Urban

Structure Type	1W	2W	3W	4W	5W	6W	7W	8W	Sum
3 Legged	✓	✓	✓	✓	✓	✓	✓		7
4 Legged	✓	✓	✓	✓	✓	✓	✓	✓	8
Billboard	✓	✓	✓	✓	✓				5
Minaret	✓	✓	✓	✓	✓				5
Mini Monopole (RT)	✓	✓	✓	✓	✓	✓			6
Monopole/Monopole Tree	✓	✓	✓	✓	✓	✓	✓		7
Streetlight/Lamp Pole	✓	✓	✓	✓	✓				5
Wall Mounted/Tripod (RT)	✓	✓	✓	✓					4
Water Tank	✓	✓	✓						3
Total									50

Area: Sub Urban

Structure Type	1W	2W	3W	4W	5W	6W	7W	8W	Sum
3 Legged	✓	✓	✓	✓	✓	✓	✓		7
4 Legged	✓	✓	✓	✓	✓	✓	✓		7
Billboard	✓	✓							2
Minaret	✓	✓	✓	✓					4
Mini Monopole (RT)	✓	✓	✓	✓					4
Monopole/Monopole Tree	✓	✓	✓	✓	✓	✓			6
Streetlight/Lamp Pole	✓	✓	✓	✓	✓				5
Wall Mounted/Tripod (RT)	✓	✓							2
Water Tank	✓	✓							2
Total									39

Area: Rural

Structure Type	1W	2W	3W	4W	5W	6W	7W	8W	Sum
3 Legged	✓	✓	✓	✓	✓	✓	✓	✓	8
4 Legged	✓	✓	✓	✓	✓	✓	✓	✓	8
Billboard									0
Minaret	✓	✓							2
Mini Monopole (RT)	✓	✓							2
Monopole/Monopole Tree	✓	✓	✓	✓	✓	✓			6
Streetlight/Lamp Pole	✓	✓	✓	✓					4
Wall Mounted/Tripod (RT)	✓								1
Water Tank	✓	✓							2
Total									33

NOTE:

- a) RT: Rooftop site
- b) 1W-8W: Number of sharers