Information & Communication Technologies Authority

Document Ref: ICTA/STD/2014/01

Deployment of Radiocommunication Infrastructure Technical and Administrative Standard for Electromagnetic Field (EMF) Safety

28 July 2014

EXPLANATORY MEMORANDUM

Allowing the ICT sector to thrive today is a matter of finding the balance between creating the right incentives and enforcing necessary rules. The ICTA is geared towards embracing the global trend which is heralding a fourth generation of regulation through effective cooperation among all stakeholders – and with the right balance of regulation.

Considering that:

1) The Information and Communication Technologies Authority (ICTA) has as function under section 18(1) (n) of the ICT Act 2001 "to ensure the safety and quality of every information and communication services including telecommunication services, and for that purpose, determine technical standards for telecommunication network, the connection of customer equipment to telecommunication networks";

2) The ICTA issued a *Deployment of Radiocommunication Infrastructure Technical and Administrative Standard for Electromagnetic Field (EMF) Safety*, hereinafter referred to as 'the Standard', on 23 March 2011;

3) The ICTA has the mandate to revise the Standard as and when required, on the basis of contributions received through public consultation exercises;

4) Licensees expressed their concerns regarding the current authorisation process, following a first consultation held as from 26 February 2014. The major concerns of licensees were essentially in relation to:-

    (a) the lengthy process with respect to fast deployment of new installations; and
    (b) the obligation to conduct a public consultation for each new site being set up prior to filing an application with the ICTA.

The ICTA has made further changes to the Standard with the objective of allowing licensees to adopt a more flexible approach with regard to the deployment of fixed radiocommunication infrastructure.

Licensees will be required to apply the provisions of this revised Standard in a reasonable way with a view to ensuring that public exposure to EMF is minimised.

The objectives of this exercise are to seek the views of key stakeholders with respect to:-

1) the shift from an authorisation process by the ICTA to a regime of self-declaration, by Licensees, with respect to Fixed Radiocommunication Infrastructure;

2) the proposed changes to the Standard, with particular focus on:-
   (a) Section 4 - DEFINITIONS AND ABBREVIATIONS;
   (b) Section 6.3 - Registration with the ICTA of New and Modified installations;
   (c) Section 6.4 - Auditing of installations registered with the ICTA; and
   (d) Section 6.6 - Documentary Evidence of Compliance with this Standard;
   (e) Appendix C - Declaration of Compliance of Fixed Radiocommunication Infrastructure;
   (f) Appendix D - Fixed Radiocommunication Infrastructure Database;
   (g) Appendix D.1 – Fixed Radiocommunication Infrastructure Details;
   (h) Appendix E - Signage;
   (i) Appendix F - Assessment of Compliance of Fixed Radiocommunication Installation with Exposure Limits.

3) other relevant general amendments to the Standard.

The ICTA resolves to:

1) make available for public consultation the Revised Standard - Ref ICTA/STD/2014/02;

2) invite views, contributions, and comments on the said Revised Standard.

Interested parties may send their written views and comments to the **Executive Director, 12th Floor, Sir Celicourt Antelme Street, Port Louis** or by email to **icta@intnet.mu** at latest **by 16:00 on 18 August 2014**.

REVISIONS

Revision No.	Date	Nature of Revision
V1	23 March 2011	Creation of document
V2	23 June 2014	Changes to:- a. Section 4 - DEFINITIONS AND ABBREVIATIONS b. Section 6.3 - *Registration with the ICTA of New and Modified installations* c. Section 6.4 - *Auditing of installations registered with the ICTA* d. Section 6.6 - *Documentary Evidence of Compliance with this Standard* e. Replacing Appendix C - DECLARATION OF COMPLIANCE OF FIXED RADIOCOMMUNICATION INFRASTRUCTURE f. Inclusion of new Appendix D – FIXED RADIOCOMMUNICATION INFRASTRUCTURE DATABASE g. Inclusion of Appendix D.1 - Fixed Radiocommunication Infrastructure Details h. Amendment to Appendix E - SIGNAGE i. Inclusion of Appendix F – ASSESSMENT OF COMPLIANCE OF FIXED RADIOCOMMUNICATION INSTALLATION WITH EXPOSURE LIMITS Other relevant general amendments to the Standard

TECHNICAL STANDARDS FOR TELECOMMUNICATION NETWORK

made under sections 18(1)(n) and 26(e) of the Information and Communication Technologies Act 2001 (as amended)

1 ACKNOWLEDGEMENT

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2 SCOPE AND OBJECTIVES

This Technical Standard for Telecommunication Network shall be known as the ***Deployment of Radiocommunication Infrastructure Technical and Administrative Standard for Electromagnetic Field (EMF) Safety***, and shall be hereinafter referred to as the Standard.

2.1 Scope

2.1.1 The Standard applies to all licensees holding a valid licence to operate a **fixed radiocommunication infrastructure** (e.g. Base Stations in a Public Land Mobile Network).

2.1.2 The licensees shall be solely responsible for the compliance of the Standard by any worker, contractor, agent or person working on behalf of the licensees for the purpose of:

(a) installing;
(b) intending to install;
(c) operating; or
(d) contracting or arranging for the installation of fixed radiocommunication infrastructure used, intended to be used, or capable of being used to supply Information and Communication Services including Telecommunication Services.

2.2 Objectives

The objectives of this Standard are:

(a) to apply a Precautionary Approach, based on the Precautionary Principle, to the deployment of fixed radiocommunication infrastructure;

(b) to provide best practice processes for demonstrating compliance with relevant exposure limits and the protection of the public;

(c) to ensure relevant stakeholders are informed and consulted before the fixed radiocommunication infrastructure is constructed;

(d) to specify standards for consultation, information availability and presentation;

(e) to consider the impact on the well being of the community, physical or otherwise, of fixed radiocommunication infrastructure; and

(f) to ensure the views of Local Authorities and the Community are considered and incorporated, if need be, into the fixed radiocommunication infrastructure site selection.

2.3 Commencement and Application of Standard

2.3.1 This revised Standard shall come into effect on 01 September 2014 and shall apply to all new/modified fixed radiocommunication infrastructure.

2.3.2 This Standard shall not apply to inherently compliant installations.

2.4 Interpretation

2.4.1 The provisions of the Interpretation and General Clauses Act (IGCA) shall be applicable for the interpretation of the Standard, where the need arises**.**

2.4.2 This Standard shall be read so as to be consistent with the Act.

2.4.3 A record is deemed to include an electronic document such as an e-mail or facsimile.

3 REVISIONS

Revisions to this document shall be made, as and when required, on the basis of contributions received through public consultation exercises.

4 DEFINITIONS AND ABBREVIATIONS

For the purposes of this Standard, the following definitions and abbreviations shall apply:

Act
means the Information and Communication Technologies Act 2001 (as amended).

Base Station (BTS)
means a radiocommunication transmitter and its associated infrastructure including any antennas, housings and other equipment.

Building and Land Use Permit
has the same meaning as in the Local Government Act 2011.

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

Controlled/occupational exposure
applies to situations where persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure also applies to the cases where the exposure is of transient nature as a result of incidental passage through a location where the exposure limits may be above the general population/uncontrolled limits, as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Compliance Report
means a report demonstrating compliance with the provisions of, and in accordance with, this Standard.

Consultation
means a process whereby Licensees seek to inform other parties about a proposed project at particular premises with the intention of giving those parties an opportunity to respond to the proposal and to have their responses considered.

Declaration of Compliance
means a declaration by a Licensee to the effect that its fixed radiocommunication infrastructure complies with the provisions of this Standard.

Equivalent isotropically radiated power (eirp)
means the product of the power supplied to the antenna and the maximum antenna gain relative to an isotropic antenna.

EMF
in this Standard refers to the radiofrequency portion of the electromagnetic spectrum.

Exposure
occurs wherever a person is subjected to electric, magnetic or electromagnetic fields or to contact currents other than those originating from physiological processes in the body or other natural phenomena.

Exposure level
is the value given in the appropriate quantity used when to express the degree of exposure of a person to electromagnetic fields or contact currents.

Exposure limits
means the values of the basic restrictions or reference levels acknowledged, according to obligatory regulations, as the limits for the permissible maximum level of the human exposure to the electromagnetic fields. In this Standard it refers to the Reference levels for general public exposure to time-varying electric and magnetic fields as established by the International Commission on Non-Ionizing Radiation Protection (ICNIRP), and adopted by the ICTA.

Fixed Radio Links
comprises Point-to-point and Point-to-multipoint Services, fixed at both ends.

General population/uncontrolled exposure
General population/uncontrolled exposure applies to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure.

General public
All non-workers are defined as the general public.

Host Operator
refers to the incumbent licensee on a shared site, or the licensee designated by mutual consent amongst licensees present on that particular site. The responsibilities of the host operator are defined in Section 2.3.2 of Appendix F to this Standard.

In-situ measurement Protocol
means the Information and Communication Technologies Authority In-situ measurement protocol for determination of RF fields (80 MHz – 8 GHz) in the vicinity of Radio Communication Base Stations for the purpose of evaluating general public exposure to Electromagnetic Fields (EMF).

ICTA
means the Information and Communication Technologies Authority.

Inherently compliant installation
means a fixed radiocommunication installation where the Effective Isotropic Radiated Power (EIRP) is 2 Watts or less.

Installation
in relation to fixed radiocommunication infrastructure, includes:

(a) the construction of the radiocommunication infrastructure, on, over or under any land;

(b) the attachment of the radiocommunication infrastructure to any building or other structure; and

(c) any activity that is ancillary or incidental to the installation of the radiocommunication infrastructure (for this purpose, installation includes an activity covered by paragraphs (a) or (b) above).

Interested and Affected Parties
include persons who reside within the immediate vicinity of the facility and should have a direct interest, economic, physical or social in the proposed facility.

Local Authority
has the same meaning as in the Local Government Act 2011

Precautionary Principle
means the principle discussed in Appendix A.

Registration
means recording with the ICTA the details of a fixed radiocommunication infrastructure including the Declaration of Compliance pertaining to that infrastructure.

RF Hazard Area
means an area where the emission level exceeds the reference exposure limits adopted by the ICT Authority for general public exposure to RF EMF.

Radiocommunication Infrastructure
means a base station used for communications.

RF
means radiofrequency.

Workers
means any contractor, agent or person employed by a Licensee, including trainees and apprentices.

5 GENERAL OBLIGATIONS ON LICENSEES

5.1 Telecommunications Network Forward Planning

A Licensee shall provide assistance, where is not unreasonable to do so, to the Local Authority in the Local Authority's forward planning for the deployment of fixed radiocommunication infrastructure, where so requested by a Local Authority, including the following:

(a) responding to reasonable requests for information that is to assist the Local Authority to develop forward plans;

(b) providing the Local Authority with the Licensee's plans concerning the deployment of fixed radiocommunication infrastructure;
(c) providing the Local Authority with the Licensee's plans concerning service level targets for planned fixed radiocommunication infrastructure;

(d) providing the Local Authority with an assessment of the opportunities for co-location of fixed radiocommunication infrastructure with the facilities of other Licensees; and

(e) engaging in discussions with other Licensees to explore opportunities for co-location and to investigate opportunities for the coordinated, strategic and efficient deployment of fixed radiocommunication infrastructure.

6 SITE SPECIFIC OBLIGATIONS ON LICENSEES

6.1 Application of the Precautionary Approach to Site Selection

6.1.1 Section 6.1 applies where a Licensee proposes to select a site for the deployment of fixed radiocommunication infrastructure.

6.1.2 The Licensee shall have written procedures for site selection for fixed radiocommunication infrastructure in relation to factors contained in clause 6.1.4 and make them available to the public on request.

6.1.3 The Licensee shall comply with those written procedures.

6.1.4 The procedures shall require, as a minimum that for each site the Licensee have regard to:

(a) the reasonable service objectives of the Licensee including:
    (i) the area the planned service shall cover;
    (ii) power levels needed to provide quality of service;
    (iii) the amount of usage the planned service shall handle;

(b) minimization of EMF exposure to the public;

(c) the possibility to co-locate on existing fixed radiocommunication infrastructure. Where co-location is not possible, the Licensee shall give the reasons thereof, which may include considerations such as: cumulative emissions, visual obtrusiveness, physical or technical limitations, coverage and potential for interference;

(d) the likelihood of an area being a community sensitive location. (Examples of sites which sometimes have been considered to be sensitive include residential areas, childcare centres, schools, aged care centres, hospitals and regional icons);

(e) the objective of avoiding, as far as is technically possible, community sensitive locations and to give preference to industrial or built-up commercial areas;

(f) relevant local government telecommunications planning policies;

(g) the outcomes of any consultation processes with Local Authorities and communities, undertaken in accordance with the guidelines set out under Appendix B of this Standard;

(h) the heritage significance (built, cultural and natural);

(i) the physical characteristics of the locality including elevation and terrain;

(j) the availability of land and public utilities;

(k) the availability of transmission to connect the fixed radiocommunication infrastructure with the rest of the network, e.g. line of sight for microwave transmission;

(l) the radiofrequency interference the planned service should cause to other services;

(m) the radiofrequency interference the planned service could experience at that location from other services or sources of radio emissions;

(n) any obligations, and opportunities, to co-locate facilities; and

(o) cost factors.

6.2 Application of Precautionary Approach to Infrastructure Design

6.2.1 Section 6.2 applies if a Licensee proposes to design fixed radiocommunication infrastructure.

6.2.2 The Licensee shall have written procedures for designing fixed radiocommunication infrastructure.

6.2.3 The Licensee shall comply with those written procedures.

6.2.4 With the objective of minimising unnecessary or incidental RF emissions and exposure, the procedures shall require that in designing infrastructure the Licensee have regard to:

(a) the reason for the installation of the infrastructure considering – coverage, capacity and quality;

(b) the positioning of antennas to minimise obstruction of radio signals;

(c) the objective of restricting access to areas where RF exposure should exceed EMF exposure limits adopted by the ICTA and to notify same with relevant RF warning signs;

(d) the type and features of the infrastructure that are required to meet service needs including:
    (i) the need for macro, micro or pico cells; and
    (ii) the need for directional or non-directional antennas.

(e) the objective of minimising power whilst meeting service objectives;

(f) the height of installations in view of minimising exposure to the general public; and

(g) whether the costs of achieving this objective are reasonable.

6.2.5 Site EMF assessments shall be made in accordance with all relevant ITU-T Recommendations, including the ITU-T Rec. K.52 and K.70 prediction methodology, as may be appropriate.

6.2.6 Notwithstanding the above, a Licensee may make use of more advanced prediction methodologies, in order to obtain more accurate evaluations of EMF exposure.

6.3 Registration with the ICTA of New and Modified installations.

6.3.1 A Licensee shall register any new site with the ICTA in the format specified at Appendix C (Declaration of Compliance) once the Licensee has:

(a) determined that the site complies with this Standard;

(b) evaluated the fixed radiocommunication infrastructure to comply with the adopted exposure limits; and

(c) determined that the installation complies with all the terms and conditions of its licence.

6.3.2 Any modified installation shall also be registered with the ICTA in the format specified at Appendix C.

6.3.3 Registration of a shared site with the ICTA shall be made by the Host Operator/Licensee.

6.3.4 The Licensee shall not operate the fixed radiocommunication infrastructure until it has registered the site with the ICTA and has received all other necessary authorisations from other relevant Authorities.

6.4 Auditing of installations registered with the ICTA.

6.4.1 The ICTA shall carry out an audit every six months of the fixed radio installations which a Licensee has set up.

6.4.2 For the purpose of this audit, the Licensee shall:

(a) submit to the ICTA, every six months, an updated database of its existing fixed radiocommunication infrastructure (in electronic format), in the format specified at Appendix D and in such manner as the ICTA may determine. This updated database shall be submitted to the ICTA no later than the 30th June and 31st December of every year respectively;

(b) provide Compliance Reports for those selected sites within a time frame of fifteen days from the time of the request made by the ICTA.

(c) provide the details of the fixed radiocommunication infrastructure pertaining to those selected sites in the format specified at Appendix D.1, within a time frame of fifteen days from the time of the request made by the ICTA;

(d) submit to the ICTA a copy of its written procedures, as specified in sections 6.1.2 and 6.2.1, and thereafter, any amendments made to same;

6.4.3 The ICTA may carry out exposure level measurements for those sites being audited.

6.4.4 The ICTA will carry out its auditing based on the following considerations:

(a) calculations of EMF exposure for the particular site;

(b) on-site exposure level measurements;

(c) technical data provided in the declaration of compliance;

(d) implementation of adequate safety measures on site (exclusion zones & safety signs).

6.5 Application of Precautionary Approach to Site Operation

6.5.1 A Licensee shall operate their fixed radiocommunication infrastructure in a manner consistent with the objectives in clause 6.2.4.

6.5.2 The Licensee shall be able to demonstrate compliance with the adopted exposure limits.

6.5.3 The Licensee shall take appropriate measures to restrict access to RF hazard areas by the general public.

6.5.4 For each RF hazard area, the Licensee shall ensure warning signs are detailed in an appropriate manner and affixed in conspicuous locations, so that they are clearly visible.

NOTE: Refer to examples of standard signage in Appendix E – RF Warning Signs.

6.5.5 In assessing whether measures are appropriate, the Licensee shall have regard to:

(a) the category of persons who shall have access to the area;

(b) the need for physical barriers;

(c) relevant occupational health and safety requirements;

(d) the views of the property owner;

(e) any site changes that have been made; and

(f) any other matter which should be relevant to ensure site safety with regards to EMF.

6.5.6 The Licensee shall ensure that its workers, involved in activities on or adjacent to fixed radiocommunication infrastructure, are sufficiently trained in radio frequency exposure safety.

6.5.7 The Licensee shall ensure that transmission equipment no longer in service does not transmit.

6.6 Documentary Evidence of Compliance with this Standard

6.6.1 Documentary evidence for the purpose of establishing compliance by a Licensee with the Standard, shall comprise of a Compliance Report and a Declaration of Compliance.

6.6.2 All compliance Reports shall be signed, dated and stamped by a responsible officer duly authorised by the Licensee.

6.6.3 A Licensee shall keep the Compliance Report for a minimum period of three years for each of its installation.

6.6.4 Notwithstanding 6.6.3 above, the Licensee shall:

(a) ensure that the parameters for operation of its installations are at all times maintained as per the respective Declaration of Compliance; and

(b) submit a fresh Declaration of Compliance whenever an installation has been modified.

6.6.5 The Compliance Report shall demonstrate the Licensee's application of the precautionary approach with respect to the following:

(a) site selection including a summary of comments received during any consultation undertaken and the Licensee's consideration of same;

(b) infrastructure design including all safety measures which the Licensee will implement;

(c) results of the site EMF assessment in terms of installation compliance by means of calculations, in accordance with all relevant ITU-T Recommendations.

(d) results of the site EMF level exposure, as determined from on-site measurements performed in accordance with the In-Situ measurement protocol.

NOTE: Refer to Appendix F – Assessment of compliance of fixed radiocommunication installation with exposure limits.

6.6.6 A copy of the Compliance Report shall be made available to any person, upon written request.

6.6.7 The licensee shall notify the ICTA of any installation which has ceased operation within a period of fifteen days.

7 RADIO EMISSIONS AND HEALTH AND SAFETY INFORMATION

7.1 Requirement for Licensees to keep informed about EMF Research

7.1.1 A Licensee should keep itself informed and updated of the significance of the results of scientific investigations or studies on EMF via relevant scientific bodies.

7.2 RF EMR Health and Safety Information

7.2.1 A Licensee shall make available to the public, freely upon demand, provided it is not unreasonable to do so any:

(a) information regarding how they address RF EMF health and safety issues in relation to their networks; and

(b) information about where research reports on the health and safety impacts of radiofrequency infrastructure should be obtained, by referring members of the public to the World Health Organisation (WHO) or to an industry body or Government agency where the Licensee has entered into a specific agreement for this purpose.

7.2.2 For a specific site, the Licensee shall provide freely upon demand, as soon as practicable, the following information to members of the public on request:

(a) a description of their fixed radiocommunication infrastructure on the site;

(b) the operating frequency of the base station transmitter;

(c) a declaration that their infrastructure is in compliance with the ICTA adopted limits for general public exposure to RF EMF;

(d) details of any RF hazard areas associated with their infrastructure and management practices to restrict access to RF hazard areas;

(e) coverage information of the area.

7.2.3 This section does not apply where in the reasonable opinion of the Licensee the information is being sought for commercial purposes.

7.3 Additional Information Supplied by Licensee

7.3.1 A Licensee shall provide information to the public about the health and safety aspects of RF transmitters in addition to that set out in Section 7.2.

7.3.2 The Licensee shall not assert anything to the effect that the absence of scientific proof means that there is no possibility of risk arising from the operation of radiocommunication infrastructure.

7.3.3 Where a Licensee provides or quotes summaries of scientific information, the Licensee shall reference the source of information.

8 COMPLAINT HANDLING

8.1 Meaning of Complaint

8.1.1 In this section a complaint means any expression of dissatisfaction or grievance made in writing to a Licensee in relation to its performance of any mandatory obligation in this Standard.

8.1.2 However, a complaint does not include:

(a) a request for information; or

(b) any comment on proposed work received by a Licensee during the consultation process.

8.1.3 If it appears to a Licensee that a person making a complaint requires assistance to express the complaint in writing, it is the duty of the Licensee to take reasonable steps to provide appropriate assistance to the person.

8.2 Licensee to Develop Complaints Handling Procedure

8.2.1 A Licensee shall establish a formal procedure for dealing with complaints, a copy of which may be communicated to the Authority.

8.2.2 The Licensee shall disseminate information about the established procedure to the public including the means by which a person should use to make a complaint to the Licensee.

8.2.3 The Licensee shall ensure that its staff is sufficiently trained in entertaining and dealing with complaints from the public or any other person.

8.3 Complaint Handling Procedure

8.3.1 A Licensee shall acknowledge complaints, in writing, within ten working days of the receipt of the complaint.

8.3.2 The Licensee shall investigate the matters raised in a complaint unless the Licensee believes that the complaint is frivolous or vexatious, or is not made in good faith.

8.3.3 Where a Licensee decides not to investigate a matter, the Licensee shall give the complainant written notice of the decision, and of the reasons for the decision.

8.3.4 The Licensee shall advise the complainant of the outcome of the investigation of their Complaint in writing and any action to be taken.

8.3.5 Where a complainant is dissatisfied with the Licensee's response, the Licensee shall inform the complainant of the availability of alternative complaint mechanisms, for example, the one existing at the ICTA.

8.3.6 A Licensee shall keep a written record, for a minimum period of three years, of all complaints received and dealt by it as well as the outcome of each complaint.

8.3.7 Where the Licensee considers a complaint to be frivolous or vexatious the Licensee shall:

(a) record its decision not to proceed further with the complaint;

(b) inform the complainant of the availability of alternative complaint mechanisms, for example, the one existing at the ICTA.

Appendix A - THE PRECAUTIONARY PRINCIPLE

Terms used in the context of risk assessment are the Precautionary Principle, the Precautionary Approach, Prudent Avoidance and ALARA (As Low As Reasonably Achievable).

For the purpose of this Standard the Precautionary Principle may be seen as the fundamental precepts upon which a practical precautionary approach could be based.

The issue of risk assessment can be summarised as the weighing up of likely harm based on all available scientific evidence, with the cost of commercial adjustment by the Licensee.

The fundamental concept of the Precautionary Principle was summed up in 1992 at the UN Conference on Environment and Development (UNCED) in Rio de Janeiro.

Consequently, the Precautionary Principle was explicitly recognised and included in the Rio Declaration. It is listed as Principle 15 among the principle of general rights and obligations of national authorities.

"In order to protect the environment, the precautionary approach should be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."

The application of the Precautionary Principle requires commitment to the idea that scientific proof of a causal link between human activities and its effect is not required.

The application of the Precautionary Principle to the sitting of radiocommunication infrastructure should include a consideration of the uncertainty of the science on a-thermal effects.

There is a need to balance the requirement for the telecommunications industry to provide adequate service against the need of the community to live in an environment that will not be a potential threat to public health.

The World Health Organisation's advice on electromagnetic fields and public health with respect to mobile telephones and their base stations (fact sheet 193 June 2000) includes the following precautionary measures.

Precautionary measures

• ***Government****: If regulatory authorities have adopted health-based guidelines but, because of public concerns, would like to introduce additional precautionary measures to reduce exposure to RF fields, they should not undermine the science base of the guidelines by incorporating arbitrary additional safety factors into the exposure limits. Precautionary measures should be introduced as a separate policy that encourages,*

through voluntary means, the reduction of RF fields by equipment manufacturers and the public. Details of such measures are given in a separate WHO Background document.

• ***Individuals****: Present scientific information does not indicate the need for any special precautions for use of mobile phones. If individuals are concerned, they might choose to limit their own or their children's RF exposure by limiting the length of calls, or using "hands-free" devices to keep mobile phones away from the head and body.*

Appendix B - CONSULTATION GUIDELINES

This guideline is designed to assist Licensees in developing and implementing appropriate consultation plans for individual infrastructure.

1. Desired Outcomes

In the design and installation of radiocommunication infrastructure the objectives of Local Authority and community consultations are to:

(a) inform and receive input from Interested and Affected Parties of the proposed project;

(b) provide adequate time for Interested and Affected Parties to consider and engage in meaningful dialogue on the project;

(c) maximize the level of accurate and accessible information about the project to affected communities;

(d) identify and attempt to resolve potential issues early in the planning process; and

(e) obtain mutually acceptable outcomes on individual projects.

When considering the desired outcomes it is to be recognised that a consultation program will not always:

(a) satisfy all participants; or

(b) resolve all differences of opinion or values.

2. Determining Size and Scope of Consultation Plan

A Licensee's consultation plan for each site should be open and transparent. The size and scope of the consultation plan should be weighted against the likely impact the proposal will have on directly affected parties, relevant stakeholders and community sensitive locations.

3. Stakeholder Analysis

At an early stage in the planning process, a stakeholder analysis should be undertaken to identify who the interested parties may be and the potential for concerns to be raised about a particular proposed facility.

The greater the likelihood for concern, the greater the extent and nature of the consultation with stakeholders that is required.

Factors that should be considered in the stakeholder analysis include:

(a) Clear identification of the proposal including consideration of the nature and sitting of the facility.
Some examples of facilities which previously have been shown to be sensitive are large visually prominent facilities located very close to where people live.

(b) Adjacent land uses and any sensitive land uses nearby.
Some examples of sites which previously have been shown to be sensitive are residential areas, child care centres, schools, aged care centres and hospitals.

(c) Identification of potentially Interested and Affected Parties at or near the proposed facility.
It is critical that a thorough search is undertaken to identify both individuals, organisations or stakeholder groups in a locality who are potentially affected. Progress Associations, Parent Groups, Sporting Groups, tenants, Occupational Health & Safety Committees and residents in adjacent Local Authority areas but living in proximity to a proposal have previously identified themselves as affected parties. Local Authority is a good source of information about potentially affected parties in a locality.

(d) Possible concerns of those individuals or groups.
Some examples of concerns that have been previously raised include health, visual amenity, potential noise and property values.

(e) The community history of the locality.
Examples of sites which have previously shown to be sensitive include localities where inadequate community consultation was undertaken in the past or where the community may have been required to deal with previous trauma, loss and controversial development such as a road proposal.

(f) Any regulatory controls at the locality.
Examples of sites which previously have been shown to be sensitive include heritage areas, scenic protection areas and national parks. The Licensee should make every effort to integrate the consultation strategy with the requirements of local planning controls and Country Planning and Environmental legislation. Engagement in seeking views of Local Authority and engaging in meaningful dialogue will facilitate the development of an appropriately scoped consultation strategy.

4. Consultation Tools

The following table summarises a number of consultation tools that can be selected to appropriately communicate with identified individuals and stakeholder(s). The number and type of tools to be used for any one proposal is dependent on the nature of the proposal and the potential level of concern and the stakeholders identified.

In all instances it is important that both verbal and written communications are clear, easy to understand and that opportunities for input and feedback are clearly stated.

Further these communications should include ways the community can get additional information from a variety of sources.

Consultation Tools
Notify immediate residential neighbours
Advertising in local paper
Community newsletters
Door knock
Posted letters to individual residents/landowners
Consult Local Authorities
Consult Tenant stakeholders
Notify community representatives
Consult with community representatives
Notify representatives of sensitive activities
Local Authority presentations
Consult precinct committees
Open House
Consult with Members of Parliament
Forming Community Representative
Committee
Public Meeting

5. The Consultation Plan

Once the stakeholder analysis has been completed, the proposed consultation plan can be developed. Key areas that need to be addressed in the plan that is to be submitted to Local Authority include:

(a) Background to the proposal including description of the current preferred proposal and the history and evaluation of alternative sites so far investigated.

(b) Informal consultations so far undertaken (if any).

(c) Consultation Plan Outline including who will be consulted, what consultation tools/methods will be used, stakeholder feedback opportunities and timeframe of consultation.

(d) Licensee response to community feedback i.e. how the Licensee proposes to address concerns, evaluate the community response.

(e) How the Licensee will report to Local Authority on consultation.

Appendix C –

<operator letterhead>

DECLARATION OF COMPLIANCE OF FIXED RADIOCOMMUNICATION INFRASTRUCTURE

Declaration Ref No[1]:-

We,*.....(Licensee name)*.....

Of .....(Address).....

Declare under our responsibility with respect to the fixed radio infrastructure hereunder

Fixed Radiocommunication Infrastructure ID:

Installation Address:

That the site selection and infrastructure design have been undertaken with a view to minimizing EMF exposure to the general public, in accordance with the precautionary principle, which forms the basis for the Deployment of Radiocommunication Infrastructure Technical and Administrative Standard for Electromagnetic Field (EMF) Safety, and the terms and conditions of our licence.

We further declare that site operation will also be undertaken, based on the same considerations.

Signature:-

Name:-

Designation:-

Date:-

Fixed Radiocommunication Infrastructure details at Annex to this Declaration

1: Declaration Reference Number should be in the format: FRI/ABC/xyz where:-
FRI stands for Fixed Radiocommunication Infrastructure
ABC is a code assigned by the ICTA upon request, to identify the Licensee, and
xyz is a consecutive roll of FRI declared by the Licensee

Appendix D – FIXED RADIOCOMMUNICATION INFRASTRUCTURE DATABASE

Note : All field descriptions are similar to those found in the Declaration of Compliance of Fixed Radiocommunication Infrastructure

Licensee/Host Operator

Date submitted

Declaration Ref No	FRI ID	Latitude	Longitude	Site Address	Type of Environment	Sharer (if any)	Type of Installation	Sector #	Azimuth	Frequency/ Technology	Height (m) from ground to centre of radiation	Height of building (as applicable)

Antenna Make & Model	Transmitting Antenna Gain (dBi)	Vertical Antenna Radiation Pattern Ref	Horizontal Antenna Radiation Pattern Ref	Antenna Size/ height (m)	Horizontal main beam width (°)	Vertical main beam width (°)	Elec. Tilt (°)	Mech. Tilt (°)	Total Tilt (°)	Asl (dB)	Max mean TX Power (dBm)	EIRP(dBm)

Total losses (dBm) (attenuation)	(TCH) (AFRCN) Or Centre Frequency	BCCH (AFRCN) or % of Power Control / Pilot Channel	Height of adjacent building along main beam	Distance of adjacent building along main beam	Date of activation of FRI

Appendix D.1 – Fixed Radiocommunication Infrastructure Details

SECTION 1 SITE DETAILS
2.1 Specify if ☐ NEW ☐ MODIFICATION
2.2 Declaration Ref. No:-
2.3 Fixed Radio Infrastructure ID:-
2.4 Installation Address:-
2.5 Geographical Coordinates:- °S °E
2.6 Environment *(Please select as appropriate, same should be replicated in FRI database)*:- ☐ Residential ☐ Commercial ☐ Industrial ☐ Touristic ☐ Agricultural ☐ Other (Specify)
2.7 Type of installation *(Please select as appropriate, same should be replicated in FRI database)*:- ☐ Ground Based Tower (GBT) ☐ Palmtree ☐ Indoor ☐ Rooftop Tower (RT) ☐ Pole ☐ Other (Specify)
2.8 CO-LOCATION OF INSTALLATION
2.8.1 Specify if this is a co-located installation ☐ Yes ☐ No
If Yes, provide Name of Sharer(s)/hosted operator(s):- 2.8.2:-
2.9 ATTACHMENTS
2.9.1 Provide a clearly marked site plan labeled **FRI/ABC/123/plan** to identify:- • installed infrastructure • sector directions for each antenna on site (identifying the antenna of each operator) *Note: Site plan must be given with respect to Grid North.* 2.9.2 Provide a picture labeled **FRI/ABC/123/photo** of the installation site, to clearly identify location. *Note: This section applies for **both** new and modified installations.*

SECTION 3 CLASS OF STATION	
3.1 Class of Station *(Please select as appropriate)*:- ☐ AT Amateur Station ☐ BC Broadcasting Station, sound ☐ BT Broadcasting Station, television ☐ FA Aeronautical Station (TX stn in the aeronautical mobile service) ☐ FB Base station (transmitting station in the land mobile service) ☐ FC Coast Station (TX stn in the maritime mobile service) ☐ FL Land station (transmitting station in the mobile service) ☐ FP Port Station (TX stn in the maritime mobile service, for port operation) ☐ FX Fixed station (transmitting station in the fixed service) ☐ LR Radiolocation Land Station (TX stn in the radiolocation service) ☐ NL Maritime radionavigation land station (TX in the maritime radionavigation service) ☐ SM Meteorological aids base station (TX stn in the meteorological aids service)	
3.2 Class of emission:-	

Appendix D.1 – Fixed Radiocommunication Infrastructure Details

Sections 3-6 to be filled in SEPARATELY for EACH operator & for EACH type of service/frequency band of operation. Submission of information pertaining to multiple frequency bands in same section is not allowed.

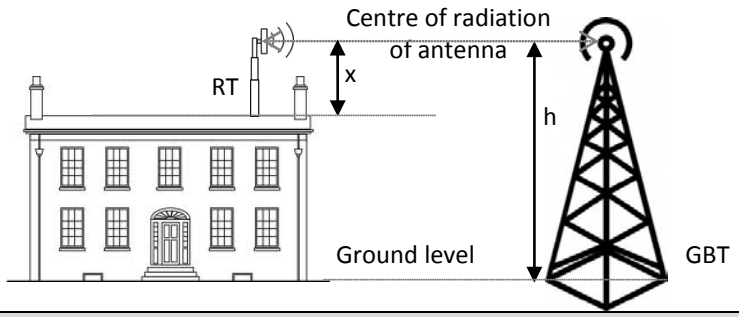
Name of Licensee:	
Frequency band of operation:-	

SECTION 3 TRANSCEIVER DETAILS
3.1 Make & model:-
3.2 Type approval reference:-
3.3 Max mean power transmitted to antenna (dBm):-
3.4 EIRP (dBm):-

SECTION 4 ANTENNA CHARACTERISTICS
4.1 Make & model:-
4.2 Transmitting antenna gain (dBi):-
4.3 Antenna Directivity :- *Is the ratio of the power density which the antenna radiates in the direction of its strongest emission to the power density radiated by an ideal isotropic radiator radiating the same total power.*
4.4 Polarization:-
4.5 Horizontal main beam width (deg):-
4.6 Vertical main beam width (deg):-
4.7 Cross Polar Discrimination (dB):-
4.8 A_{sl} (dB):- *(Is the maximum side-lobe amplitude with respect to the maximum)*
4.9 Antenna Size/Height (m):- *(Provide Antenna dimension)*

SECTION 5 LOSSES
5.1 Insertion loss (dB):- *(equals to 10log(power input at antenna port Pr/ power at transmitter output port Pt))*
5.2 Feeder attenuation (dB/100m):- 5.3 Feeder length (m):- 5.4 Additional attenuation (dB):- 5.5 Total losses (attenuation) (dB):-
5.6 Antenna radiation pattern diagrams reference Ref: ☐H ☐V *Provide antenna pattern radiation diagram (dB values for 0° - 360° **in increments of 1°**) or file reference for **relevant frequency band** of operation and **tilt** relevant to **this** installation.*

Appendix D.1 – Fixed Radiocommunication Infrastructure Details

SECTION 6			
FREQUENCY DETAILS	**Sector 1**	**Sector 2**	**Sector N**
6.1 Identify & provide the TX frequency(ies) (TCH) or ARFCN or centre frequency (as appropriate) (MHz) :- *(ARFCN: Absolute Radio Frequency Channel Number)*			
6.2 BCCH or % of Power Control/ Pilot Channel (as applicable):-			
ANTENNA DETAILS			
6.3 Azimuth of maximum radiation from Grid North (deg):-			
6.4 Electrical tilt (deg):-			
6.5 Mechanical tilt (deg):-			
6.6 Total tilt α (deg):-			
6.7 Antenna height h (m) from ground level to centre of radiation:- 6.7a Antenna height x (m) from rooftop(*) to centre of radiation:- *(*) If applicable*			
		Note: h is the height from ground level to centre of radiation for any type of antenna installation	
SITE DETAILS			
6.8 Adjacent Building Description			
6.9 Height (m) of adjacent building along main beam of antenna above terrain level			
6.10 Distance (m) of adjacent building along main beam of antenna			
6.11 Exclusion area, as applicable for Accessibility Category 4 :- ☐ N/A ☐ Circular ☐ Rectangular Size:			

Appendix D.1 – Fixed Radiocommunication Infrastructure Details

SECTION 7	LICENSEE/HOST OPERATOR DECLARATION

Name of Licensee/Host Operator hereby declares that:-

1. All information contained herein has been verified to be correct and accurate.

2. Additional information requested has been provided as attachment.

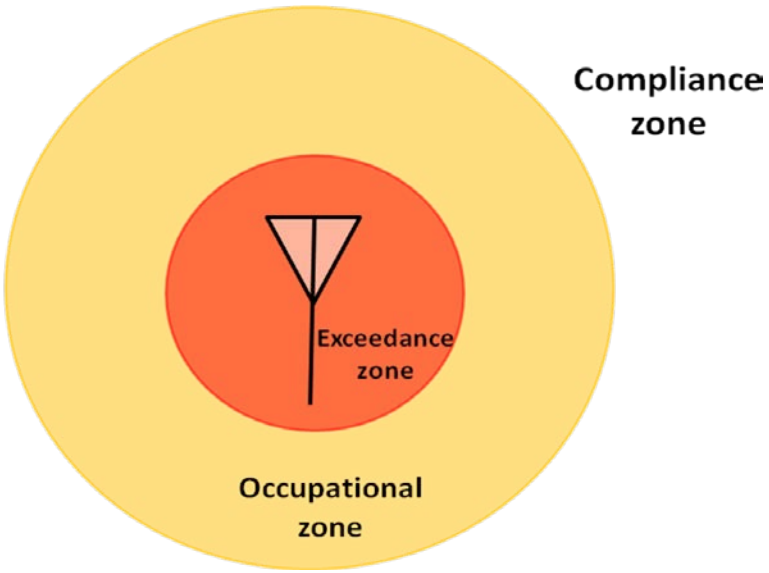
Signature:- .....
Authorised Signatory's Name:- .....
Designation:- .....
Date:- .....

Affix Company Stamp Here

Appendix E - SIGNAGE

1. Exclusion Zones and implementation of Signage

EMF exposure assessment is made if the transmitters are present and conducted for all locations where people might be exposed to EMF in their normal activities. All such exposures to EMF relates to one of these three zones:



(a) Compliance zone

In the compliance zone, potential exposure to EMF is below the applicable limits for both controlled/occupational exposure and uncontrolled/general public exposure.

(b) Occupational zone

In the occupational zone, potential exposure to EMF is below the applicable limits for controlled/occupational exposure but exceeds the applicable limits for uncontrolled/general public exposure.

(c) Exceedance zone

In the exceedance zone, potential exposure to EMF exceeds the applicable limits for both controlled/occupational exposure and uncontrolled/general public exposure.

2. RF Warning Signs

RF EMF warning signs are used to identify areas that should exceed the general public exposure limits.

The Licensee will ensure provision of proper signage at the entrance of site (roof top or tower).

The Licensee will ensure provision of proper signage on the boundary of occupational exclusion zones by way of fencing/yellow coloured lines and the proper sign at point of access restriction.

The following is a typical example of sign used to inform and warn of RF radiation hazards at transmitter sites.

EMF warning sign

Appendix F – ASSESSMENT OF COMPLIANCE OF FIXED RADIOCOMMUNICATION INSTALLATION WITH EXPOSURE LIMITS

Any Licensee operating fixed radiocommunication infrastructure which emits Electromagnetic Fields ("EMF") for the purpose of communications shall ensure that its installations are compliant with the adopted EMF exposure limits. These installations shall include base stations transmitters (BTS), repeaters and broadcasting transmitters.

1. ICNIRP Reference Levels

The limit of EMF emission from a fixed radiocommunication infrastructure site at accessible areas shall not exceed any one of the parameters below for the public and occupational workers respectively.

	Frequency range	E-field strength (V/m)	H-field strength (A/m)	Equivalent plane wave power density S_{eq} (W/m^2)
General Public	1 MHz–10 MHz	$87/f^{1/2}$	$0.73/f$	—
	10 MHz–400 MHz	28	0.073	2
	400 MHz–2 GHz	$1.375f^{1/2}$	$0.0037f^{1/2}$	$f/200$
	2 GHz–300 GHz	61	0.16	10
Occupational Workers	1 MHz–10 MHz	$610/f$	$1.6/f$	—
	10 MHz–400 MHz	61	0.16	10
	400 MHz–2 GHz	$3f^{1/2}$	$0.008f^{1/2}$	$f/40$
	2 GHz–300 GHz	137	0.36	50

Note:
1. f as indicated in the frequency range column.
2. Provided that basic restrictions are met and adverse indirect effects can be excluded, field strength values can be exceeded.
3. For frequencies between 100 kHz and 10 GHz, S_{eq}, E^2 and H^2 are averaged over any 6-minutes period.

Table C.1: Reference levels for (1) general public and (2) occupational workers exposure to time-varying electric and magnetic fields (unperturbed rms values).

2. Compliance evaluation

Compliance with the exposure limit as stipulated above shall be evaluated in accordance with the methods below.

It is to be noted that transmitters with a maximum EIRP of 2W or less are classified as ***inherently compliant*** and no further action is deemed necessary.

2.1 Compliance by EIRP calculation

For single transmitter sites, assessment of the value of ($EIRP/EIRP_{th}$) is to be made at various publicly accessible points in the environment surrounding the Base Transceiver Station (BTS) site (for example on rooftop, on ground or at adjacent buildings). The assessment is based on the formula:

$$\sum \frac{EIRP_i}{EIRP_{th,i}} \leq 1$$

where

$EIRP_i$ is the temporal averaged radiated power of the antenna at a particular frequency i, and
$EIRP_{th,i}$ is the EIRP threshold relevant to the particular antenna parameters and accessibility conditions.

Annex B of ITU-T Recommendation K.52 sets out the criteria for accessibility conditions and directivity categories for a set of reference antenna parameter or types depending on accessibility of various areas in the proximity of the transmitter to a person.

The method of calculation is detailed in ITU-T Recommendation K.52 Annex B Appendix II and Ill.

If the value of ($EIRP/EIRP_{th}$) is found to be less than one at all points in the environment, the site is declared compliant.

At a given point or location, marginal contribution of EMF radiation from BTS located further than 100 metres can be excluded for the purpose of the estimation of the overall EMF exposure.

2.2 Compliance by software simulation

There are cases of installations, with two or more transmitters/antennas (especially in populated areas) which are affected by reflections from buildings or variations in earth elevations, etc. Such installations include:-

- Rooftop poles
- Rooftop having multiple towers (shared BTS sites)
- Multiple antennas mounted on a single tower (shared BTS sites)

In the above cases, where the environment is complex, the EIRP methods of ITU-T Recommendation K.52 may be insufficient to determine zone boundaries for EMF exposure. A Licensee needs therefore use appropriate software, as proposed in ITU-T

Rec. K.52, ITU-T Rec. K.61 and ITU-T Rec. K.70, to refine those zone boundaries obtained using ITU-T Recommendation K.52 and map out the electromagnetic field around the BTS.

The test results of software simulation are to be presented in the form of the power density, calculated in a plane of interest, expressed as a percentage of the exposure limit with logarithmic legend. Various positions two (2) meters above the roof top level of the BTS site, ground level and roof top or floors of adjacent buildings in the vicinity of 30 meters radius from the BTS should be considered.

Based on these simulated results, it is required that EMF measurements be performed if the electromagnetic exposure is found to exceed the stipulated exposure limit.

2.3 Compliance of Shared sites

2.3.1 Sites categorised as 'shared sites' are as follows:

(a) A ground based tower site with transmitters from multiple licensees; and

(b) A roof top, with transmitters from multiple licensees;

(c) Other infrastructures with transmitters from multiple licensees.

2.3.2 For the purpose of compliance with the Standard, every shared site shall be assigned a Host Operator. The responsibilities of the Host Operator shall be as follows:

(a) To conduct simulation to ensure compliance of the site to the exposure limits;

(b) To implement remedial measures in the event of non compliance, if required; and

(c) To ensure compliance assessment in the event there is a change or addition to the particular site.

2.3.3 The Host Operator for each site shall be the incumbent operator on site, or designated by mutual consent amongst licensees present on site.

2.4 Remedial actions for non-compliant shared sites

2.4.1 In cases of non compliance, where public access cannot be restricted to exclusion zones (like adjacent building with over exposure), the rectification of non compliance shall be the joint responsibility of the Host Operator as well as all the licensees operating antennas at the said site.

2.4.2 The cause of non compliance can be due to single licensee or combined effect. Where exposure limits are exceeded, the following rules shall apply to reach site compliance:

(a) All Licensees have to individually prove their compliance with regards to the non compliant point or area. The single or multiple licensee(s) which fail to prove their individual compliance will be requested to use mitigation techniques either by reducing transmitted power, increasing antenna height, changing antenna direction (azimuth), or if required, relocating antenna.

(b) In the case of all Licensees individually proving compliance but where the combined effect of many antennas have shown non compliance, the problem can be remedied with simulation or frequency selective measurements with either of the following two processes being applicable:

(i) Simulate individual exclusion zones for every antenna and rectify or move the antenna whose exclusion zone is crossing non compliant area(s) or point(s).

(ii) If no individual antenna's exclusion zone is crossing non compliant area, then remove the antenna whose exclusion zone is nearest to the non compliant area or point.

(iii) Repeat the process until the site is compliant.

or

(i) Do frequency selective measurement with worst case extrapolation and if any individual operator found to exceed exposure limit, rectify or move the non-complying antenna(s).

(ii) If no individual antenna or Licensee exceeds the threshold independently in frequency selective measurement, rectify or move the antenna or Licensee with maximum value of power density.

(iii) Repeat the process until the site is compliant.

All Licensees have to individually and jointly comply with the restriction prescribed for EMF exposure limits for general public. Hence, responsibility of EMF compliance of shared sites lies with all service providers on site.

2.5 Exclusion Zones Calculation

2.5.1 Single Antennas or Sectoral Antennas at Single Pole

The exclusion zone distance for general public and occupational exposure can be calculated using the formulas in below table (Refer to ITU-T Rec. K.70, Annex C):

Radio Frequency range	General public exposure	Occupational exposure
1 MHz–10 MHz	$r = 0.1 \times (eirp \times f)^{1/2}$ or $r = 0.129 \times (erp \times f)^{1/2}$	$r = 0.0144 \times f \times eirp^{1/2}$ or $r = 0.0184 \times f \times eirp^{1/2}$
10 MHz–400 MHz	$r = 0.319 \times (eirp)^{1/2}$ or $r = 0.409 \times (erp)^{1/2}$	$r = 0.143 \times (eirp)^{1/2}$ or $r = 0.184 \times (erp)^{1/2}$
400 MHz–2 GHz	$r = 6.38 \times (eirp/f)^{1/2}$ or $r = 8.16 \times (erp/f)^{1/2}$	$r = 2.92 \times (eirp/f)^{1/2}$ or $r = 3.74 \times (erp/f)^{1/2}$
2 GHz–300 GHz	$r = 0.143 \times (eirp)^{1/2}$ or $r = 0.184 \times (erp)^{1/2}$	$r = 0.0638 \times (eirp)^{1/2}$ or $r = 0.0819 \times (erp)^{1/2}$

Where

r is the minimum antenna distance, in metres.

f is the frequency in MHz

erp is the effective radiated power in the direction of the largest antenna gain, in Watts.

eirp is the equivalent isotropic radiated power in the direction of the largest antenna gain, in Watts.

Table C.2: Calculation for exclusion zone for (1) the general public & (2) occupational workers

2.5.2 Multiple antennas site

Analytical formulas are sufficient for calculations of exclusion zone parameters for single antennas or multiple antennas at single location. However, on many sites numerous antennas are installed in close proximity to each other and the calculation of exclusion zones through analytical formulas become impractically conservative or difficult to interpret due to the complexity of the environment.

For complex scattering environments, exclusion zones/compliance distances for multiple antennas in close proximity are drawn by software simulation based on methodologies as prescribed in ITU-T Rec. K.52, ITU-T Rec. K.61 and ITU-T Rec. K.70 documents.

A Licensee may, for the above purpose, opt to make use of more advanced prediction technologies, in order to obtain more accurate evaluations of EMF exposure.