

FREQUENTLY ASKED QUESTIONS (FAQs) ON MOBILE PHONE BASE STATIONS AND EXPOSURE TO EMF RADIATION

Mobile technologies such as Global System for Mobile Communications (GSM) are now commonly used overall the world to provide voice telephony services. In Uganda, today, there are around 8.5 million mobile subscribers out of the four (4) billion mobile connections world wide. The mobile networks in Uganda currently use predominantly GSM technology operating in the 900MHz, 1800 and 1900 MHz frequency bands.

In order for a mobile subscriber to access voice telephony services, a network or infrastructure must be put in place to enable this access. A typical GSM network consists of a base station transceiver (receives and transmits electromagnetic signals) with which a mobile station (that is the mobile phone/handset) communicates within a specific radius or area.

A base station transceiver comprises three main elements: the antennas, a supporting structure such as the mast or building to hold the antenna, and the equipment to power the radio equipment. The antennas emit electromagnetic fields (EMF) or radio frequency fields (RF), which is a form of energy technically referred to as **non-ionising radiation** (NIR). NIR refers to the fact that this radiation does not carry enough energy to ionise atoms or molecules as compared to ionising radiation.

Masts are free standing steel structures that are used to support antennas located at base stations usually for the purposes of providing geographical coverage. Antennas may also be placed on other structures such as buildings and other existing structures.

The number of subscribers that can be served by a base station depends on a number of factors such as the number of calls made within a particular time frame, the topology of an area, and mobility of the subscribers. Base stations are, therefore, strategically located to, among others, enable people not only make calls within a certain radius, but also allow for seamless communication while on move. This is one reason why base stations are increasingly being located in residential areas, business centres, schools, and hospitals, among others.

While there is a lot of public concern as to the effects of Electromagnetic radiation (EMF) emitted from these base stations on people's health and the environment, much of it is due to limited awareness. In attempt to address these concerns, the Uganda Communications Commission (UCC) has offered answers to the following frequently asked questions on mobile phone base stations and EMF radiation:

1. What are the health risks of telecommunications masts?

The health risks from telecommunications masts may include accidental risks (like falling of the mast) and risks related to exposure to EMF radiation.

According to World Health Organisation, extensive research has been conducted into possible health effects within the entire frequency range or spectrum. All reviews conducted so far have indicated that exposures below the limits recommended in the International Commission of Non-Ionising Radiation Protection (ICNIRP), 1998 guidelines, covering the full frequency range from 0-300GHz do not produce any known adverse health effects. In Uganda, technologies such as Global System for Mobile Communications (GSM), Code Division Multiple Access (CDMA) and Universal Mobile Telecommunications System (UMTS) fall within this frequency range.

Since research regarding health effects from EMF radiation of mobile phones and their base station antennas is still ongoing, precautionary measures are necessary. These include simple administrative controls such as limitation of access and other protection measures like warnings or barriers around areas of strong EMF sources.

2. How do I know I am safe when leaving near a base station?

The following factors should be taken into consideration in determining whether you are safe or not when living near a base station:

- a) Find out the owner of, or whoever is responsible for operating, the base station.
- b) Find out whether an environment impact assessment (EIA) was done prior to installing the base station and whether an EIA certificate of approval of was issued by National Environment Management Authority (NEMA). This certificate spells out terms and conditions for installing and operating the base station with minimal impact on environment including effects on health, noise generation and visual impact. This, and information such as environmental impact statements and regulations, may be obtained from NEMA.
- c) Endeavour to get information regarding existing safety standards. This information may be obtained from the International Commission of Non-Ionising Radiation Protection (ICNIRP) and the International Telecommunications Union (ITU) websites- <http://www.icnirp.de/documents/emfgdl.pdf>: *guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to*

300GHz) or <http://www.itu.int/rec/T-REC-K.52-200412-I/en> - *guidance on complying with limits for human exposure to electromagnetic fields.*

It should be noted that the safety standards depend on a number of issues such as nature of installation or radiating source and its characteristics (frequency range, polarisation, and modulation, etc) and the level of exposure to the radiation. The safety levels defined by ICNIRP are different for occupational workers and general public.

d) The level of exposure – this is how much intensity of radiation reaches your body to cause any effect over a period of time. Research has revealed that different body parts behave differently when exposed to levels of radiations, in this case the head being more sensitive. The level of exposure depends on a number of factors such as proximity (how near and/or how far you are) to the radiating source or the main beam of radiation of the antenna and how long you remain in close proximity.

3. Who is in charge of ensuring that mobile phone base stations are safe?

The National Environment Management Authority (NEMA) is the principal agency in charge of all environmental issues in Uganda. Specific to mobile phone base stations, NEMA is in charge of assessing impact of mobile phone base stations on the environment. These impacts include effects on human health.

4. What is UCC's role in ensuring human safety from EMF exposure at base stations?

As the regulator of the Communications sector in Uganda, UCC issues licences for the installation and provision of telecommunications infrastructure and services. The licences require the operator to conform to specific technical standards and requirements as well as relevant laws of Uganda. These requirements include compliance with the National Environment Act and Regulations.

Furthermore, upon request by NEMA, UCC reviews and gives technical advice on the environment impact and audit reports of base stations with focus on how the developer has assessed the environmental impact of the telecommunications equipment (*i.e. equipment associated with transmission reception, switching and distribution of telecommunications signals at the proposed sites*). NEMA then considers these comments for any further action.

In addition, UCC provides technical and policy advice on communications sectoral issues that have a bearing on the environment such as infrastructure development and equipment standards.

5. What are the precautions to protect the public from the risks that arise from exposure to EMF radiation from mobile phone base stations?

The safety measures in place to protect the public from EMF radiation include:-

- a) Administrative control measures such as restriction to entry to the base stations (e.g. fencing, locking up, posting security guards) and placing appropriate signage
- b) Site placing and location aspects - the positioning and/or location of antennas at places way above head level while standing (typically considered 1.5m above ground level) and ground level (i.e. on masts and roof tops) to limit human EMF exposure.

6. What should I do if a base station near my home makes a lot of noise and emits fumes?

You are advised to lodge your complaint with the National Environment Management Authority (NEMA), which is the National Agency for environment management in Uganda.

7. Are there any national guidelines/standards to protect the public from radiation from base station? Where can I get this information?

There are currently no national guidelines/standards in Uganda regarding EMF radiation from base stations. However, in the absence of these standards, the International Commission of Non-Ionising Radiation Protection (ICNIRP) guidelines (<http://www.icnirp.de/documents/emfgdl.pdf>) may be used as a guideline. These guidelines are recommended by World Health Organisation (WHO) and International Telecommunications Union (ITU) as best practice worldwide.

8. Where do I lodge my complaint concerning radiation at mobile phone base station?

All complaints regarding mobile phone base station are lodged with NEMA, which is the National Principal Agency in charge of all environmental issues.