ALTON

Association of Licensed Telecommunications Operators of Nigeria

FREQUENTLY ASKED QUESTIONS ON HEALTH AND SAFETY AROUND BASE TRANSCEIVER STATIONS

1. What is a base station?

A base station (commonly known as a mast) is a transmission and reception station in a fixed location, consisting of one or more receive/transmit antenna and microwave dish mounted on any supporting structure such as mast/tower or building rooftops, connected by cable to electronic (radio) equipment usually housed in a room or shelter, for the purpose of facilitating communication between an access device (e.g., mobile phone) and a communications network. The base station antennas receive and send messages to a mobile phone/device by radio frequency (RF) radiation.

2. How does a mobile phone network operate?

When a user makes a call, the mobile phone communicates with a nearby base station and while the user moves about, he/she will be 'handed over' to other base stations which may have a better signal strength. This signal strength are radio frequency (RF) signals that are transmitted between the mobile antenna and the base station antenna. Base station antennas are elevated and located clear of physical obstruction to ensure wide coverage.

3. What is radio frequency radiation?

Radio frequency (RF) radiation is the transfer of energy by radio waves. It lies in the frequency range 3 kilohertz (kHz) to 300 gigahertz (GHz). RF radiation is non-ionizing radiation, meaning that it is weak and does not have sufficient energy to remove an electron from an atom or molecule (ionization). This is as opposed to ionizing radiation that has sufficient energy to remove an electron from an atom or molecule such as the gamma rays and X-rays.

4. Why do we need base stations in our communities?

A base station provides network coverage to people using mobile devices in its specific surrounding geographical area. As the number of mobile devices in a community grows, more base stations are needed. This explains why there are more base stations in densely populated areas such as trading centers and markets.

5. Are base stations dangerous to the surrounding community?

No. So far, there is no evidence that indicates that base stations are dangerous to the surrounding community. This is in respect with the RF energy from the emitting sources (antennas), as they operate at low power, produce low RF exposure levels, and are specifically designed for the environment they are located in. The closer to a base station the mobile device user is, the stronger the signal from the base station and thus the better the quality of communication.

6. What determines where a base station is located?

Several factors determine the location of a base station.

- Number of calls expected to be made in the coverage area,
- Antenna height,
- Frequency on which the base station will operate,
- Topography and other physical constraints such as trees and building.
- The target population to be covered.
- Levels of economic activities in the area, etc.

The Site Developers are encouraged to comply with the prerequisites prior to installing a base station in an area. These include among others, conducting an Environmental Impact Assessment (EIA) and consulting with local authorities on the proposed development. The Site Developers are encouraged to engage/sensitize the local community about the proposed project.

7. What is a minimum distance for which a base station should be located from human access?

Item "a" of the communique issued at the end of the inter-ministerial review meeting on Thursday, 16 January 2014 stipulates that the setback shall be to the property (occupied building) and shall not be less than 10 meters. Item "I" also allows for a 7.5m setback waiver to be issued by the Inter-Ministerial Committee in a highly built-up vicinity.
The location of a base station is determined based chiefly on its ability to provide the best coverage for the area at hand and enhance the capacity of the network in an area.

8. Are base stations regulated in Nigeria?

The Nigerian Communications Commission (NCC), the regulator of Communications services in Nigeria, regulates the RF emissions from mobile phone/base stations infrastructure in Nigeria.

9. What are the license requirements for base stations in Nigeria?

- Site Developers of communications infrastructure are required by law to comply with all the laws, regulations, guidelines and standards issued by the Government of Nigeria on health, safety and environmental protection.
- Telecommunications systems, equipment, devices and operations to comply with the radio emissions standards and safety limits prescribed by the International Commission for Non-Ionizing Radiation Protection (ICNIRP) limits and standards recommended by the International Telecommunications Union (ITU).

10. Does Nigeria have safety standards and guidelines for base stations?

Yes. The NCC has guidelines for installation of mast and towers. Transmitting devices on the towers are type approved as safe by the NCC prior to deployment at sites. The NCC also applies the International Commission for Non-Ionizing Radiation Protection (ICNIRP) guidelines for limiting exposure. ICNIRP is a body of independent science experts addressing the important issues of possible adverse effects on human health of exposure to non-ionizing radiation. The ICNIRP guidelines are endorsed by the World Health Organization (WHO) and recommended by the International Telecommunications Union (ITU) and are widely adopted worldwide.

These guidelines were developed following reviews of the scientific literature, including thermal and non-thermal effects and designed to provide protection against all identified health hazards of RF energy with large safety margins. They use basic limits (Specific Absorption Rate [SAR], specific absorption, current density) and reference levels (electric field, magnetic, power density), exposure limits, time averaging and separate consideration for low and high exposure for both occupational/workers and the public.

It is noteworthy to emphasize that exposure limits are not emission limits; they apply to locations accessible to occupational workers or the public, and thus it is possible to achieve compliance by limiting access to areas where the field limits are exceeded.

11. Do the base stations in Nigeria meet these safety standards and guidelines?

The inspections and assessments carried in Nigeria thus far show that the emissions at the various base station sites are within the limits permitted under the ICNIRP guidelines on complying with limits for human exposure to RF radiation.

12. Does exposure from base stations cause cancer?

The substantial amount of research carried out by recognized institutions like the WHO, the International Agency for Research on Cancer (IARC) and Health Protection Agency (HPA) regarding the

probable health risks has not found, so far, any link between telecommunications developments (base stations) and an elevated risk of cancer.

The biological effects of non-ionizing radiation, backed by evidenced scientific research is surface heating in direct line of sight over a prolonged exposure period. Non-ionizing radiation does not have sufficient energy to cause heating effect for those around a base station.

However, health experts still recognize how critical the public concerns are, and thus studies are still on going to fully assess the potential long-term effects of communications developments.

13. Does exposure from base stations cause impotence in men?

The NCC is not aware of any study that has linked RF emissions to causing impotence in men.

14. Does exposure from base stations cause contamination of tank water?

The NCC is not aware of any study that has linked RF emissions to tank water contamination. However, base station sites have operational spill prevention and response strategies to ensure prevention and immediate response of spill or leak of diesel or oil that can contaminate surrounding water sources.

15. If base stations are safe, why is there still public concern?

NCC recognizes that some people are concerned about the potential health effects from base stations, and specifically the location of these in proximity to human settlements. NCC is thus committed to providing useful information and sensitization along with its stakeholders to address these concerns. NCC also continues to conduct periodic and on-request compliance assessments around these developments.

16. What is NCC doing to address public concerns around base stations?

NCC conducts assessments to evaluate the compliance of base stations with the specified standards on exposure levels from base stations in comparison with the reference levels.

- As stipulated by the ICNIRP guidelines (the likelihood of human exposure to the radiation/emissions from the emitters – for both the public and workers),
- Recommended by the ITU on guidance on complying with limits of human exposure to electromagnetic fields and guidance on measurements and numerical prediction of electromagnetic fields for compliance with human exposure limits for telecommunications installations.

The inspections carried out in Nigeria thus far show that the emissions at the various base station sites are within the limits permitted under the ICNIRP guidelines on complying with limits for human exposure to EMF up to 300GHz.

17. What measures have been put in place to protect the public from any probable risks from the base stations in Nigeria?

Base stations can meet all the national and international safety standards and guidelines when constructed with proper engineering design, installation and regulatory control. Simple administrative controls like restriction to the base stations like fencing, locking and warning signs are also put in place.

18. What are International Organizations Position with respect to impact of base stations on public health and safety?

WHO notes that “Considering the very low exposure levels and research results collected to date, there is no convincing scientific evidence that the weak RF signals from base stations and wireless networks cause adverse health effects."

WHO Online Q&A September 2013 states "Studies to date provide no indication that environmental exposure to RF fields, such as from base stations, increases the risk of cancer or any other disease."

UK Advisory Group on Non-Ionising Radiation (AGNIR) "In summary, although a substantial amount of research has been conducted in this area, there is no convincing evidence that RF field exposure below guideline levels causes health effects in adults or children"

Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) states "The results of current scientific research show that there are no evident adverse health effects if [EMF] exposure remains below the levels set by current standards"

IET states that "The balance of scientific evidence to date still does not indicate that harmful effects occur in humans due to low-level exposure to EMFs"

Health Canada states that "With respect to cell phone towers, as long as exposures respect the limits set in Health Canada's guidelines, there is no scientific reason to consider cell phone towers dangerous to the public"

19. What measures have been put in place to prevent noise pollution from power generators?

The following alternative sources of power are deployed at the base stations to eliminate noise pollution:

- Hybrid batteries.
  A sound-proofed diesel generator ("DG") that not only complies with regulatory recommended noise limits but also reduces the noise drastically shall be deployed at the site as back up when the hybrid is charging and automatically switches to the hybrid system when the batteries are fully charged.
- National grid: Where there is power availability, the primary source of power for the site shall be from the grid supply. This will reduce the DG working hours.
- Solar installation shall be deployed to the site to further reduce the DG run-hours.

20. Where can I obtain more information?

NCC is available to provide more information on any inquiries or questions regarding health and safety around telecommunications infrastructure (mobile phone base stations). For more information, you can visit NCC website (https://ncc.gov.ng/).