



# **RWANDA APPROACH TO EMF RADIATION PROTECTION**

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# OUTLINE

- Rwanda ICT Landscape
- EMF Protection approach
- Public concern EMF
- Compliance assessment
- SAR Level
- Way Forward

# Telecom Landscape

The Telecom landscape in Rwanda is mainly composed of:

- 03 Telecom operators
- 05 Internet Service Providers
- 14 Broadcasting sites for Radio and Television
  - 90 % geographical coverage in Digital TV
  - 98 % geographical coverage in FM Radio
  - 56.1 % of Mobile Penetration
  - Close to 1000 BTS
  - Optical fiber reaching all districts and boarder posts

# Electromagnetic Field Protection Approach

- With the development of ICT infrastructure in the country, the general public started raising the questions and concerns over the EMF hazard.
- The Regulatory Authority has handled in the past several cases of people complaining about illness allegedly due to the proximity of Telecom infrastructure.
- In 2009, the Regulatory Authority developed Guidelines to protect the public against hazardous EMF radiation.  
[http://www.rura.gov.rw/docs/Board Decisions/GUIDELINES EMF.pdf](http://www.rura.gov.rw/docs/Board_Decisions/GUIDELINES_EMF.pdf)

- The guidelines are mainly based on ICNIRP Guidelines, ITU-T Recommendation K.52 and other best practices observed elsewhere.
- The Guidelines specify the allowed radiation limits for the General Public and the Operators or RF practitioners in the vicinity of the transmitter.
- The document further provide guidelines for the siting and installation of the RF Device, the signage, fences etc.

- The Regulatory Authority, further developed guidelines for telecom infrastructure sharing, which provides directives to follow the EMF radiation protection based on ICNIRP values.
- In 2012, the Authority purchased an equipment to measure the EMF Radiation.



# Compliance Assessment

- With the development of Guidelines for Infrastructure sharing and Guidelines for EMF Radiation protection, concerned stakeholders were informed on the compliance assessment: [http://rura.gov.rw/docs/Board Decisions/GUIDELINES SITING SHARINGB BTS.pdf](http://rura.gov.rw/docs/Board_Decisions/GUIDELINES_SITING_SHARINGB_BTS.pdf)
- The Regulatory Authority reserves the right to conduct both regular and unannounced inspections to any site of the operators.

- On regular basis, the Regulatory Authority conducts country wide EMF measurement to assess the level of EMF radiation to the public.
- The latest measurement was conducted in March – April 2013 and the results were published to assure the public about the safety of the Telecom and Broadcasting infrastructures.





- Example of the results obtained in the measurement

| Index | Service       | Act           | Max Avg       | STD          |
|-------|---------------|---------------|---------------|--------------|
| 1     | TV            | 2.787375 V/m  | 2.801033 V/m  | 28 V/m       |
| 2     | FM-Radio      | 2.145612 V/m  | 2.223803 V/m  | 28 V/m       |
| 3     | Mid           | 1.453343 V/m  | 1.447631 V/m  | 28 V/m       |
| 4     | Paging        | 0.7584813 V/m | 0.7771782 V/m | 28 V/m       |
| 5     | BandIII       | 1.644921 V/m  | 1.633231 V/m  | 28 V/m       |
| 6     | Trains        | 0.134736 V/m  | 0.134266 V/m  | 29.72725 V/m |
| 7     | BandIV        | 2.083851 V/m  | 2.042393 V/m  | 29.80995 V/m |
| 8     | BandV         | 0.8918317 V/m | 0.9135605 V/m | 38.64755 V/m |
| 9     | GSM-R         | 0.2552515 V/m | 0.2248029 V/m | 40.69532 V/m |
| 10    | GSM           | 1.714503 V/m  | 1.696336 V/m  | 41.02067 V/m |
| 11    | L-Band        | 0.599429 V/m  | 0.5877079 V/m | 52.39454 V/m |
| 12    | DECT          | 0.5423898 V/m | 0.5398572 V/m | 59.61891 V/m |
| 13    | UMTS-TDD      | 1.459086 V/m  | 1.464967 V/m  | 59.93519 V/m |
| 14    | UMTS          | 1.220716 V/m  | 1.250374 V/m  | 61 V/m       |
| 15    | W-LAN         | 2.063409 V/m  | 2.076266 V/m  | 61 V/m       |
| 16    | ISM           | 0.9427508 V/m | 0.9813704 V/m | 61 V/m       |
|       | Total Value:  | 5.945251 V/m  | 5.918817 V/m  | 28 V/m       |
|       | Others Value: | 0 V/m         | 0 V/m         | 0 V/m        |

Actual Value

Standard Value<sub>9</sub>

| Index | Service       | Act           | Max           | STD          |
|-------|---------------|---------------|---------------|--------------|
| 1     | TV            | 3.022794 V/m  | 3.318718 V/m  | 28 V/m       |
| 2     | FM-Radio      | 1.729748 V/m  | 1.956141 V/m  | 28 V/m       |
| 3     | Mid           | 1.685097 V/m  | 1.685097 V/m  | 28 V/m       |
| 4     | Paging        | 0.781117 V/m  | 0.8919353 V/m | 28 V/m       |
| 5     | BandIII       | 1.816811 V/m  | 1.861325 V/m  | 28 V/m       |
| 6     | Trains        | 0.1206475 V/m | 0.1957398 V/m | 29.72725 V/m |
| 7     | BandIV        | 2.223318 V/m  | 2.238552 V/m  | 29.80995 V/m |
| 8     | BandV         | 0.9944482 V/m | 1.044299 V/m  | 38.64755 V/m |
| 9     | GSM-R         | 0.2429623 V/m | 0.2786219 V/m | 40.69532 V/m |
| 10    | GSM           | 2.014735 V/m  | 2.040749 V/m  | 41.02067 V/m |
| 11    | L-Band        | 0.6724176 V/m | 0.6833436 V/m | 52.39454 V/m |
| 12    | DECT          | 0.5921169 V/m | 0.6354095 V/m | 59.61891 V/m |
| 13    | UMTS-TDD      | 1.62434 V/m   | 1.678084 V/m  | 59.93519 V/m |
| 14    | UMTS          | 1.466177 V/m  | 1.466177 V/m  | 61 V/m       |
| 15    | W-LAN         | 2.219275 V/m  | 2.383664 V/m  | 61 V/m       |
| 16    | ISM           | 1.068805 V/m  | 1.128825 V/m  | 61 V/m       |
|       | Total Value:  | 8.903321 V/m  | 9.014223 V/m  | 28 V/m       |
|       | Others Value: | 6.218205 V/m  | 6.24999 V/m   | 28 V/m       |

Actual Value

Standard Value

# SAR Level Measurement

- With the difficulty to measure the SAR and the high cost to establish a Test lab for SAR Measurement, we are relying on data provided by Mobile phone manufacturers on SAR.
- In order to enforce the compliance with acceptable SAR level (2 W/kg for the head and 4W/kg for the limb), we are planning to include the checking of the IMEI number and associated SAR Value as part of Type approval parameters for Mobile phones.

- Way Forwards?
  - Improve communication between stakeholders and inform the general public on EMF issues.
  - Continue observing different researches and best practices for the protection of the general public against hazardous EMR.

**THANK YOU**

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