

PUBLIC NOTICE

GENERAL PUBLIC SAFETY ON ELECTROMAGNETIC FIELDS RADIATION

The growth of communications services in terms of both diversity and coverage is accompanied by a rapid increase of radio-communications transmitters which radiate Electromagnetic Fields (EMF).

The increased use of telecommunications and Broadcasting equipment such as mobile phones, base stations, antennas, radar equipment, radios, televisions, computers, etc has repeatedly raised public interest in health issues associated with exposure to electromagnetic radiation.

In line with its mandate to ensure a safe and reliable service delivery to the public, the Rwanda Utilities Regulation Authority (RURA) conducted a four (04) Months EMF radiation measurement on selected sites using a state of the art Radiation Exposure Meter. The sites for the measurement were selected based on the high concentration of the telecommunication and broadcasting transmitters as follows:

- Rwamagana at MTN and TIGO sites;
- BYUMBA (Gicumbi district) at ORINFOR Transmitter site;
- MUHANGA at MTN and AIRTEL Base station sites;
- TUMBA (Huye district) at MTN and TIGO Base station sites

And in Kigali, the measurements were taken at:

- Deutsche Welle (DW) relay station of KINYINYA near its Radio transmitting antennas;
- KIST at the MUHABURA Building;
- Mount Jali at ORINFOR Transmitter site,

- STARTIMES Transmitter site and MTN and AIRTEL transmitter sites;

- MINIFRA building;
- TELECOM HOUSE building and
- AMAHORO Stadium.

The result of the EMF radiation has shown that all measurements are well below the maximum acceptable level set by the International Commission on Non-ionizing Radiation Protection (ICNIRP) and endorsed by leading International organizations like the World Health Organization (WHO), the International Telecommunication Union (ITU), etc. The maximum acceptable level of EMF radiation set by the ICNIRP is 28 V/m for the general public while the average cumulative EMF is 5V/m for Telecommunication Base station and 11V/m for broadcasting transmitters.

RURA would therefore like to assure the public that the telecommunication infrastructures deployed in the country are safe in terms of EMF and that further safety measures will continue to be applied and enforced on every transmitter for the protection of the general public against hazardous EMF Radiations.

Done at Kigali, **May 13, 2013**

François Régis GATARAYIHA

Director General

1. RWAMAGANA (MTN, TIGO AND AIRTEL SITE)

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

2. KAYONZA

Index	Service	Act	Max Avg	STD
1	TV	2.908428 V/m	2.849327 V/m	28 V/m
2	FM-Radio	2.125736 V/m	2.223803 V/m	28 V/m
3	Mid	1.488426 V/m	1.455206 V/m	28 V/m
4	Paging	0.7712076 V/m	0.7771782 V/m	28 V/m
5	BandIII	1.651569 V/m	1.635396 V/m	28 V/m
6	Trains	0.1150473 V/m	0.134266 V/m	29.72725 V/m
7	BandIV	2.014783 V/m	2.065582 V/m	29.80995 V/m
8	BandV	0.890848 V/m	0.9135605 V/m	38.64755 V/m
9	GSM-R	0.2236151 V/m	0.2256227 V/m	40.69532 V/m
10	GSM	1.7093 V/m	1.697005 V/m	41.02067 V/m
11	L-Band	0.5913571 V/m	0.5993403 V/m	52.39454 V/m
12	DECT	0.5507708 V/m	0.545601 V/m	59.61891 V/m
13	UMTS-TDD	1.466344 V/m	1.464967 V/m	59.93519 V/m
14	UMTS	1.237695 V/m	1.250374 V/m	61 V/m
15	W-LAN	2.051523 V/m	2.076266 V/m	61 V/m
16	ISM	0.9639172 V/m	0.9813704 V/m	61 V/m
	Total Value:	5.985521 V/m	5.944031 V/m	28 V/m
	Others Value:	0 V/m	0 V/m	0 V/m

3. BYUMBA (ORINFOR SITE)

Index	Service	Act	Max	STD
1	TV	2.496883 V/m	3.795468 V/m	28 V/m
2	FM-Radio	1.589881 V/m	2.11182 V/m	28 V/m
3	Mid	1.298887 V/m	1.817311 V/m	28 V/m
4	Paging	0.7166843 V/m	1.10165 V/m	28 V/m
5	BandIII	1.763126 V/m	1.839929 V/m	28 V/m
	Total Value:	4.564982 V/m	5.313388 V/m	28 V/m
	Others Value:	2.601453 V/m	3.087322 V/m	28 V/m

4. HUYE (NEAR NUR)

Index	Service	Minimum Frequency	Maximum Frequency	RBW	Act	Max Avg	STD
1	TV Band I	47 MHz	68 MHz	5 MHz	2.968841 V/m	3.061144 V/m	28 V/m
2	FM-Radio	87.5 MHz	108 MHz	200 kHz	1.836811 V/m	1.752686 V/m	28 V/m
3	Mid Wave	137 MHz	165 MHz	3 MHz	1.554636 V/m	1.594395 V/m	28 V/m
4	Paging	165 MHz	174 MHz	2 MHz	0.8469226 V/m	0.8251306 V/m	28 V/m
5	BandIII (DVB-T)	174 MHz	230 MHz	5 MHz	1.710847 V/m	1.81863 V/m	28 V/m
6	Trains	467.45 MHz	468.3 MHz	200 kHz	0.135718 V/m	0.1569141 V/m	29.72725 V/m
7	BandIV (DVB-T)	470 MHz	790 MHz	10 MHz	2.146847 V/m	2.136703 V/m	29.80995 V/m
8	BandV (DAB)	790 MHz	862 MHz	5 MHz	1.019779 V/m	1.02231 V/m	38.64755 V/m
9	GSM-R	876 MHz	880 MHz	500 kHz	0.2513517 V/m	0.257738 V/m	40.69532 V/m
10	GSM 900	890 MHz	960 MHz	500 kHz	1.02038 V/m	1.007083 V/m	41.02067 V/m
11	L-Band (DAB)	1.452 GHz	1.492 GHz	5 MHz	0.6488889 V/m	0.6613076 V/m	52.39454 V/m
12	GSM 1800	1.71 GHz	1.88 GHz	500 kHz	1.590241 V/m	1.610191 V/m	56.85955 V/m
13	DECT	1.88 GHz	1.9 GHz	3 MHz	0.556107 V/m	0.5944669 V/m	59.61891 V/m
14	UMTS-TDD	1.9 GHz	2.025 GHz	5 MHz	1.618632 V/m	1.607491 V/m	59.93519 V/m
15	UMTS DL	2.11 GHz	2.17 GHz	5 MHz	1.357703 V/m	1.389465 V/m	61 V/m
16	W-LAN	2.4 GHz	2.4835 GHz	20 MHz	2.257739 V/m	2.28401 V/m	61 V/m
17	ISM	2.4835 GHz	2.5 GHz	3 MHz	1.071442 V/m	1.074847 V/m	61 V/m
	Total Value:				6.244086 V/m	6.291021 V/m	28 V/m
	Others Value:				0 V/m	0 V/m	0 V/m

5. HUYE (TUMBA)

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

6. MUHANGA (NEAR MTN TOWER)

Index	Service	Act	Max	STD
1	TV	3.293592 V/m	3.318718 V/m	28 V/m
2	FM-Radio	1.793901 V/m	1.956141 V/m	28 V/m
3	Mid	1.553103 V/m	1.685097 V/m	28 V/m
4	Paging	0.8556389 V/m	0.8919353 V/m	28 V/m
5	BandIII	1.818639 V/m	1.889358 V/m	28 V/m
6	Trains	0.1472852 V/m	0.1957398 V/m	29.72725 V/m
7	BandIV	2.200161 V/m	2.238552 V/m	29.80995 V/m
8	BandV	1.025834 V/m	1.044299 V/m	38.64755 V/m
9	GSM-R	0.2394201 V/m	0.2786219 V/m	40.69532 V/m
10	GSM	1.962845 V/m	2.040749 V/m	41.02067 V/m
11	L-Band	0.6721655 V/m	0.6833436 V/m	52.39454 V/m
12	DECT	0.5813724 V/m	0.6382888 V/m	59.61891 V/m
13	UMTS-TDD	1.618106 V/m	1.678084 V/m	59.93519 V/m
14	UMTS	1.425643 V/m	1.466177 V/m	61 V/m
15	W-LAN	2.308003 V/m	2.383664 V/m	61 V/m
16	ISM	1.132907 V/m	1.132907 V/m	61 V/m
	Total Value:	8.946321 V/m	9.014223 V/m	28 V/m
	Others Value:	6.135425 V/m	6.24999 V/m	28 V/m

7. JALI (NEAR ORINFPOR TOWER)

Index	Service	Minimum Frequency	Maximum Frequency	RBW	Act	STD
1	TV Band I	47 MHz	68 MHz	5 MHz	3.154684 V/m	28 V/m
2	FM-Radio	87.5 MHz	108 MHz	200 kHz	4.797015 V/m	28 V/m
3	Mid Wave	137 MHz	165 MHz	3 MHz	1.66644 V/m	28 V/m
4	Paging	165 MHz	174 MHz	2 MHz	0.8292817 V/m	28 V/m
5	BandIII (DVB-T)	174 MHz	230 MHz	5 MHz	1.921811 V/m	28 V/m
6	Trains	467.45 MHz	468.3 MHz	200 kHz	0.1725663 V/m	29.72725 V/m
7	BandIV (DVB-T)	470 MHz	790 MHz	10 MHz	2.593914 V/m	29.80995 V/m
8	BandV (DAB)	790 MHz	862 MHz	5 MHz	1.005114 V/m	38.64755 V/m
9	GSM-R	876 MHz	880 MHz	500 kHz	0.2557475 V/m	40.69532 V/m
10	GSM 900	890 MHz	960 MHz	500 kHz	1.00729 V/m	41.02067 V/m
11	L-Band (DAB)	1.452 GHz	1.492 GHz	5 MHz	0.6537334 V/m	52.39454 V/m
12	GSM 1800	1.71 GHz	1.88 GHz	500 kHz	1.635695 V/m	56.85955 V/m
13	DECT	1.88 GHz	1.9 GHz	3 MHz	0.6310015 V/m	59.61891 V/m
14	UMTS-TDD	1.9 GHz	2.025 GHz	5 MHz	1.654635 V/m	59.93519 V/m
15	UMTS DL	2.11 GHz	2.17 GHz	5 MHz	1.399908 V/m	61 V/m
16	W-LAN	2.4 GHz	2.4835 GHz	20 MHz	2.297959 V/m	61 V/m
17	ISM	2.4835 GHz	2.5 GHz	3 MHz	1.067441 V/m	61 V/m
	Total Value:				10.13345 V/m	28 V/m
	Others Value:				6.252853 V/m	28 V/m

8. JALI (NEAR MTN, AIRTEL AND TIGO TOWERS)

Index	Service	Minimum Frequency	Maximum Frequency	RBW	Act	STD
1	Band I	47 MHz	68 MHz	5 MHz	2.971366 V/m	28 V/m
2	UKW	87.5 MHz	108 MHz	200 kHz	3.767528 V/m	28 V/m
3	Band II/DAB	174 MHz	230 MHz	5 MHz	1.82949 V/m	28 V/m
4	Band IV/V/DTVB	470 MHz	790 MHz	10 MHz	2.262522 V/m	29.79343 V/m
5	GSM 900	890 MHz	960 MHz	500 kHz	0.9330887 V/m	41.00867 V/m
6	GSM 1800	1.71 GHz	1.88 GHz	500 kHz	1.563883 V/m	56.85089 V/m
7	UMTS	1.92 GHz	2.17 GHz	5 MHz	2.572697 V/m	60.24163 V/m
	Total Value:				6.436185 V/m	28 V/m
	Others Value:				0 V/m	0 V/m

9. JALI (NEAR STARTIMES TOWERS)

Index	Service	Minimum Frequency	Maximum Frequency	RBW	Act	STD
1	Band I	47 MHz	68 MHz	5 MHz	3.193074 V/m	28 V/m
2	UKW	87.5 MHz	108 MHz	200 kHz	2.935396 V/m	28 V/m
3	Band II/DAB	174 MHz	230 MHz	5 MHz	2.000865 V/m	28 V/m
4	Band IV/V/DTVB	470 MHz	790 MHz	10 MHz	2.444636 V/m	29.79343 V/m
5	GSM 900	890 MHz	960 MHz	500 kHz	0.9098814 V/m	41.00867 V/m
6	GSM 1800	1.71 GHz	1.88 GHz	500 kHz	1.617851 V/m	56.85089 V/m
7	UMTS	1.92 GHz	2.17 GHz	5 MHz	2.682592 V/m	60.24163 V/m
	Total Value:				6.279618 V/m	28 V/m
	Others Value:				0 V/m	0 V/m

10. MININFRA BUILDING

Index	Service	Minimum Frequency	Maximum Frequency	RBW	Act	STD
1	Band I	47 MHz	68 MHz	5 MHz	3.752229 V/m	28 V/m
2	UKW	87.5 MHz	108 MHz	200 kHz	2.128946 V/m	28 V/m
3	Band II/DAB	174 MHz	230 MHz	5 MHz	1.697431 V/m	28 V/m
4	Band IV/V/DTVB	470 MHz	790 MHz	10 MHz	2.095907 V/m	29.79343 V/m
5	GSM 900	890 MHz	960 MHz	500 kHz	1.810031 V/m	41.00867 V/m
6	GSM 1800	1.71 GHz	1.88 GHz	500 kHz	2.02458 V/m	56.85089 V/m
7	UMTS	1.92 GHz	2.17 GHz	5 MHz	2.804963 V/m	60.24163 V/m
	Total Value:				8.532905 V/m	28 V/m
	Others Value:				5.628657 V/m	28 V/m

11. TELECOM HOUSE

Index	Service	Minimum Frequency	Maximum Frequency	RBW	Act	STD
1	Band I	47 MHz	68 MHz	5 MHz	3.767526 V/m	28 V/m
2	UKW	87.5 MHz	108 MHz	200 kHz	2.285554 V/m	28 V/m
3	Band II/DAB	174 MHz	230 MHz	5 MHz	2.16521 V/m	28 V/m
4	Band IV/V/DTVB	470 MHz	790 MHz	10 MHz	2.297536 V/m	29.79343 V/m
5	GSM 900	890 MHz	960 MHz	500 kHz	1.043807 V/m	41.00867 V/m
6	GSM 1800	1.71 GHz	1.88 GHz	500 kHz	1.757721 V/m	56.85089 V/m
7	UMTS	1.92 GHz	2.17 GHz	5 MHz	2.663239 V/m	60.24163 V/m
	Total Value:				8.453409 V/m	28 V/m
	Others Value:				5.550076 V/m	28 V/m

12. AMAHORO STADIUM

Index	Service	Minimum Frequency	Maximum Frequency	RBW	Act	STD
1	Band I	47 MHz	68 MHz	5 MHz	3.204024 V/m	28 V/m
2	UKW	87.5 MHz	108 MHz	200 kHz	1.700527 V/m	28 V/m
3	Band II/DAB	174 MHz	230 MHz	5 MHz	1.762402 V/m	28 V/m
4	Band IV/V/DTVB	470 MHz	790 MHz	10 MHz	2.242614 V/m	29.79343 V/m
5	GSM 900	890 MHz	960 MHz	500 kHz	1.220205 V/m	41.00867 V/m
6	GSM 1800	1.71 GHz	1.88 GHz	500 kHz	1.801383 V/m	56.85089 V/m
7	UMTS	1.92 GHz	2.17 GHz	5 MHz	2.568908 V/m	60.24163 V/m
	Total Value:				8.053856 V/m	28 V/m
	Others Value:				5.677895 V/m	28 V/m

13. KIST (MUHABURA BUILDING)

Index	Service	Act	Max	Std
1	TV	2.577 $\mu\text{W}/\text{m}^2$	2.577 $\mu\text{W}/\text{m}^2$	2.080 W/m^2
2	FM-Radio	3.242 $\mu\text{W}/\text{m}^2$	4.143 $\mu\text{W}/\text{m}^2$	2.080 W/m^2
3	Mid	626.5 nW/m^2	709.7 nW/m^2	2.080 W/m^2
4	Paging	160.6 nW/m^2	214.6 nW/m^2	2.080 W/m^2
5	BandIII	810.0 nW/m^2	854.5 nW/m^2	2.080 W/m^2
6	Trains	3.693 nW/m^2	7.273 nW/m^2	2.344 W/m^2
7	BandIV	2.381 $\mu\text{W}/\text{m}^2$	3.298 $\mu\text{W}/\text{m}^2$	2.357 W/m^2
8	BandV	224.8 nW/m^2	252.5 nW/m^2	3.962 W/m^2
9	GSM-R	591.9 nW/m^2	3.824 $\mu\text{W}/\text{m}^2$	4.393 W/m^2
10	GSM	3.604 mW/m^2	6.039 mW/m^2	4.463 W/m^2
	Total	6.470 mW/m^2	7.513 mW/m^2	2.080 W/m^2

Isotropic

Index: 29.1 • MAN • Date: 22.07.11 10:05:11

MR: 8 mW/m^2 RBW: 200 kHz (Auto) Sweep Time: 4.997 s **RECALL** Off No. of Runs: 19
 Noise Suppr.: AVG: 6 min

Display Evaluation Extras

Battery:	Ext. Power	GPS:	1°57'46.3" S	Ant:	3AX 27M-3G	SrvTbl:	EU Full Band	Result Type
22.07.11	10:48:56	30°3'52.4" E	Cable:	---	Std:	ICNIRP GP		
Table View: Condensed ▲								
Index	Service	Act	Max	Std				
7	BandIV	2.415 nW/cm ²	2.415 nW/cm ²	235.7 μW/cm ²				
8	BandV	24.54 pW/cm ²	24.54 pW/cm ²	396.2 μW/cm ²				
9	GSM-R	3.490 nW/cm ²	3.490 nW/cm ²	439.3 μW/cm ²				
10	GSM	2.670 μW/cm ²	2.670 μW/cm ²	446.3 μW/cm ²				
11	L-Band	9.814 pW/cm ²	9.814 pW/cm ²	728.2 μW/cm ²				
12	DECT	7.526 pW/cm ²	7.526 pW/cm ²	942.8 μW/cm ²				
13	UMTS-TDD	53.71 pW/cm ²	53.71 pW/cm ²	952.9 μW/cm ²				
14	UMTS	1.281 μW/cm ²	1.281 μW/cm ²	987.0 μW/cm ²				
15	W-LAN	102.8 pW/cm ²	102.8 pW/cm ²	987.0 μW/cm ²				
16	ISM	21.09 pW/cm ²	21.09 pW/cm ²	987.0 μW/cm ²				
	Total	3.960 μW/cm ²	3.960 μW/cm ²	208.0 μW/cm ²				
Isotropic								
Index: 45.1 • MAN • Date: 22.07.11 10:48:56								
MR:	800 nW/cm ²	RBW:	200 kHz (Auto)	Sweep Time:	5.076 s	RECALL	Off No. of Runs:	1
				Noise Suppr.:			AVG:	6 min
Display	Evaluation						Extras	

14. KINYINYA (NEAR DEUTSCHE WELLE RADIO)

Battery:	Ext. Power	GPS:	1°54'58.4" S	Ant:	3AX 27M-3G	SrvTbl:	EU Full Band	Result Type
10.01.12	15:47:52	30°7'00.4" E	Cable:	---	Std:	ICNIRP GP		
Table View: Condensed ▼								
Index	Service	Act	Std					
1	TV	2.845 V/m	28.00 V/m					
2	FM-Radio	1.705 V/m	28.00 V/m					
3	Mid	1.461 V/m	28.00 V/m					
4	Paging	800,1 mV/m	28.00 V/m					
5	BandIII	1.601 V/m	28.00 V/m					
6	Trains	154.7 mV/m	29.73 V/m					
7	BandIV	2.008 V/m	29.81 V/m					
8	BandV	911.9 mV/m	38.65 V/m					
9	GSM-R	209.1 mV/m	40.70 V/m					
	Others	5.595 V/m	28.00 V/m					
	Total	8.071 V/m	28.00 V/m					
Isotropic								
Index: 114.1 • MAN • Date: 10.01.12 15:47:52								
MR:	160 V/m	RBW:	200 kHz (Auto)	Sweep Time:	1.893 s	RECALL	Off No. of Runs:	143
				Noise Suppr.:			AVG:	4
Display	Evaluation						Extras	

At the time of measurement, all the four Radio transmitters were operational and the measurement was done at about twenty meters from the antenna towers in residential area.