



20TH INTERNATIONAL ADVISORY COMMITTEE MEETING

Anatel Report on EMF Activities in Brazil

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1. INTRODUCTION:

The main purpose of this document is to present an update of what has been done in Brazil regarding Electromagnetic Fields - EMF, since the 19th IAC meeting in June 2014.

2. ACTIVITIES RELATED TO EMF EXPOSURE

The National Telecommunications Agency (ANATEL) normally participates in workshops and public audiences emphasizing that there are technical aspects that should be in local legislation and others that are Anatel's responsibility.

As I said in the last year the capability of EMF measurement that Anatel bought for attendant the World Cup doubled until 2014. See in the *Figure 1* and *Figure 2* an example of equipment use.



Figure 1



Figure 2

The main characteristics of the equipment showed below are the following:



A permanent monitoring system that allows on-going scrutiny of the emission levels of any source of electromagnetic radiation (mobile telephone antennas, WiFi, high-voltage power lines, etc.) and verification that they meet the safety standards established by the competent authorities and regulations in each country. The measurements taken can be published via the Internet to the different stakeholder communities.

There are other important characteristic:

- Continuous Monitoring of electromagnetic fields in specific locations: cities, schools, hospitals, etc. (24/365).
- Broad-Band Measurement: that allows economies of scale in deployment of monitoring networks to cover large areas.
- Control Center: with web interface for remote management of monitoring stations and display of electromagnetic field levels on any computer with Internet connection.
- Easy to install anywhere: autonomy ensured by solar power supply and wireless communication.
- Resistant to Harsh Weather Conditions: thanks to IP66 protective casing, making it resistant to heavy rainfall, high temperatures, dust, etc.
- Complies with Recommendation ITU-T K.83: which specifies standards for implementation of networks, for continuous electromagnetic emissions measurement.

It's important to emphasize that the equipment named "MonitEM" has two main purposes:

1. *Monitoring of an emission source or a sensitive place:*

- a. The aim is to monitor the exposure levels produced by electromagnetic radiation emitters (telecommunication facilities, mobile telephone base stations, WiFi modems, power lines, ...), and so the equipment will be installed as close as possible and in the direction of maximum radiation, seeking out the point with the strongest field, so that all the other points can be covered.
- b. Where the aim is to monitor a sensitive place, we are not concerned about the maximum radiation point but rather the exposure level at the sensitive place, such as a school, a hospital, a building near a radio communication base station, etc. Consequently the remote monitoring equipment will be located at the point where we wish to monitor the EMF exposure.

2. *Communication*

- a. Enterprises and governments do not only need to make measurements, it is advisable that they publish them, making the data gathered available to the public or employees. The best way to gain trust from people is to provide information efficiently and transparently.
- b. The MonitEM makes this possible in a simple and highly practical manner, on a very easy-to-use web page that provides a very satisfying user experience, allowing the equipment to be located easily on maps and showing data simply by clicking on the icon of the pertinent equipment. Of course it is the decision of the body or company using the system to make data available or keep it private.

More information could be obtained from the link:

<http://www.wavecontrol-rfsafety.com/en/191069/Productes-n3/Specifications.htm>

In addition, the online system implemented to attend the NIR Law and receive measurements made by telecommunications service providers is already in operation and being used by them.

3. NEW POLICIES AND LEGISLATIONS REGARDING EMF EXPOSURE

Regarding the legislation, it is important to mention that the “Antenna’s Law” (L.13.116), an umbrella to guide municipalities against a series of different laws on this topic and that aims to establish general rules for base stations (BS) deployment, acting as guidelines for municipalities, is finally approved. (http://www.planalto.gov.br/ccivil_03/_Ato2015-2018/2015/Lei/L13116.htm).

This law establishes general rules concerning the licensing process, installation and telecommunications infrastructure sharing, in order to make it consistent with the socioeconomic development of the country. It is indicated in the Law the aim to safeguard against the effects of non-ionizing radiation emission.

Additionally, the technical staff of Anatel finished the Preliminary Draft New Resolution (PDNR), that, when approved, will update the national regulation, in force since 2002, with best practices for the evaluation of the human exposure to EMFs in the vicinity of radiocommunication stations. The PDNR will be submitted to ANATEL’s Board, for Public Consultation Approval in the second semester of this year.

4. NEW PUBLIC INFORMATION ACTIVITIES

4.1. International Participation

Anatel contributed to the development of the Recommendation ITU-T K.100 - Measurement of radio frequency electromagnetic fields to determine compliance with human exposure limits when a base station is put into service - and the Supplement 1 to ITU-T K.91 - Guide on Electromagnetic Fields and Health, both approved in 2014.

<http://www.itu.int/rec/T-REC-K.100-201412-I/en>

<http://www.itu.int/rec/T-REC-K.Sup1-201407-I>

4.2. Academic Work

Anatel support their workers that wish to study in the graduate level (MSc and PhD) in topics related to its activity. Recently, a PhD thesis entitled “Contributions to the Study of Human Exposure to Radiofrequency Electromagnetic Fields (only in Portuguese)” was presented in the Brasília University by one of its regulation specialist, Mr. Agostinho Linhares.

The general objective of this thesis is to present the characterization of the electromagnetic environment in such a way to assist in the exposure assessment. The proposal takes into account the characteristics of the radiating antenna, such as half-power angle and the side lobes; the propagation mechanisms of the electromagnetic waves, as line-of-sight, multipath and diffraction; and the representation of the person exposed.

The specific objective is to provide a consistent methodology, to identify the maximum exposure location, in order to assist in the compliance assessment of the radiocommunication station with the limits of human exposure to electromagnetic fields.

The purpose is to carefully define the points of measurements in any environment, urban or not, so that the appropriate assessment is performed.

The accuracy of the methodology is demonstrated in simulated and real scenarios. Despite the focus of this work is base stations, the methodology is general and can be applied, for instance, in the assessment of broadcasting stations. The study on possible adverse health effects is beyond the scope of this work.

5. FINAL COMMENTS:

Finally, ANATEL keeps an open dialogue with society, operators, lawmakers and other governmental authorities to present clear information of what is being done in Brazil and worldwide regarding EMF exposure issue, always following WHO points of view.