



Comisión Iberoamericana de Protección Radiológica de los
Campos Electro-magnéticos y las Radiaciones No Ionizantes

CIPRACEM report on the Radioprotection criteria used by ICNIRP:

CIPRACEM has analyzed the latest ICNIRP publications and contrasted them with the ICRP Radioprotection criteria, the ethical principles that govern IRPA activities and the criteria established in the statute of creation of the ICNIRP in 1992

1) - ICNIRP Principles for NIR Radiation Protection 2020-12-08

Although the Introduction states, very emphatically, that *"the principles established for Radioprotection of Ionizing Radiations (ICRP 2007) such as Justification and Optimization, which are based on ethical values, will be respected,"* it is observed that this is only a declamation because **at no time is it recommended to comply with these principles**. In the ICNIRP Guidelines 2020, Justification and Optimization are not recommended and are not even mentioned in the document, so the initial statement is completely void of content and only intended to mislead the inadvertent reader.

To try to explain the non-respect of the ethical principles in which the Radiological Protection Criteria applied by the ICRP are established, the ICNIRP establishes the new concept of *"deterministic threshold"* and says *"When the exposure restrictions set by ICNIRP are well below 'threshold levels' for adverse health effects, further reduction in the limit values does not result in additional health benefits, and therefore optimization is not necessary" ...!*

But DETERMINISTIC RISKS BY DEFINITION **DO NOT HAVE A THRESHOLD...!** A threshold cannot be established with characterizing dose-response relationships between exposure to NIR and incidences (or severity) of adverse effects. This was not done by ICNIRP since the group only considers thermal damage to be caused by NIR and dismisses all non-thermal effects.

- a) IARC has clearly established that NIRs are a possible human carcinogen (2B) based on childhood leukemia for ELF and on the results of the Interphone study and the studies by Hardell and associates for RF.
- b) IARC has not been able to establish category 2A or 1 because there were no studies on animals, but later several studies on animals were carried out confirming the carcinogenic power evidenced in humans.
- c) In addition to the carcinogenic power of NIRs, the studies by Tillmann, Lerch and the Ramazzini Inst. on animals and the INTEROCC study on humans show a Co-carcinogenic power of NIRs that has not been observed in ionizing radiation.
- d) Many biological mechanisms that initiate the carcinogenesis process are well established. The Society for Oxidants and Antioxidants in Medical Sciences (Editorial of March 29, 2014) determines that NIRs cause "cellular oxidative stress" a key characteristic of several human carcinogens that can cause gene mutations, chromosomal damage, oncogene activation, and tumor suppressor gene inactivation. This was the result of a "Peer Review" on studies carried out where the Mechanism was tested in 93% of the 76 studies carried out and Concludes *"RNI: a new oxidant for living cells"*. NIRs cannot break chemical bonds, but this mechanism explains the "mutagenesis" and chromosomal aberrations that were observed in the REFLEX Project and in hundreds of subsequent studies.

Declaring a threshold for cancer risk is an unacceptable measure for not meeting the criteria for radiation protection established by the ICRP.

On the other hand, in the **ICNIRP Guidelines 2020**, the change made determines that the Reference Levels were increased for frequencies between 2 and 6 GHz by a **factor of 4** to facilitate 5G deployment, which with the previous values could not have been carried out. (That is, the exposure values of the people are accommodated according to the needs of the companies). Nowhere in this document are the **principles of justification or optimization** even mentioned...!

In conclusion, the ICNIRP **does not meet nor does it recommend meeting** the Radioprotection criteria established by the ICRP.

2) Attitude towards countries that follow ICRP principles

ICNIRP not only does not follow the principles of ICRP but also, in collaboration with companies, questions, criticizes and takes action in those countries that have decided to follow the ICRP criteria and the recommendations of the European Community (Res 1815/11) and proof of this policy can be seen in the ITU-T Series K document edited by the International Telecommunication Union called *"The impact of RF-EMF exposure limits stricter than the ICNIRP or IEEE Guidelines on 4G and 5G mobile network deployment"*.

Many countries, such as China, India, Poland, Russia, Italy, Switzerland, and regions of Belgium or cities like Paris have decided to use the Justification criterion and optimize exposures by setting exposure limits 100 or 1000 times lower than those of the ICNIRP. In fact, Switzerland has a Law that has been effective for more than 20 years and Russia, to give another example, has developed the World Soccer Championship without any difficulties in communications...!

The ITU document says that there is an urgent need to start the process of "harmonization" which implies that countries *"abandon the ICRP criteria"* and only use the ICNIRP limits.

It also says verbatim: *"In this regard, the World Health Organization (WHO) has commenced a process of harmonization of EMF standards worldwide"* (that this task is carried out by the WHO is difficult to understand)

In summary, **ICNIRP not only does not apply the ICRP criteria, but also makes their use difficult for countries that do.**

3) Treatment of animal studies

The document *"ICNIRP 2020 Evaluation of 2 EMF animal carcinogenicity studies"* concludes by saying *"Together, the limitations of these two studies prevent drawing conclusions about carcinogenicity in relation to RF electromagnetic fields"* and **discards them**...!

- a) Both studies, with huge budgets, were subjected to a "peer review" and finally reviewed by an independent panel of experts who concluded in contrast to ICNIRP that there was **clear evidence of carcinogenic activity and some evidence of carcinogenic activity**, depending on the case, ICNIRP failed to recognize that in addition to statistical analyses, evaluations of evidence of carcinogenicity are influenced by factors such as the presence preneoplastic lesions at the same site, the rarity of the specific tumor in untreated animals, genotoxicity, etc. These experimental studies provide sufficient evidence to call for re-evaluation of the IARC's conclusions regarding the carcinogenic potential of RFR in humans. The finding of concordance in cell types affected in rats and in human studies strengthens the animal-to-human association.

- b) It should be noted that the NTP study was preceded by a work of temperature determination in the animals **in order to demonstrate THAT THEY ARE NOT DUE TO THERMAL EFFECTS**. In addition, animals in the NTP study could maintain their ability to thermoregulate as evidenced by the findings of no significant effects on body weight, no tissue damage during the first month of the study, and no exposure–related clinical observations that would indicate thermal or metabolic stress.
- c) The carcinogenic and co-carcinogenic effects **are not always proportional to the doses** as has been observed in the experiences of Tilmann and Lerchl because, unlike IR, NIRs change the expression of oncogenes, which determines that from that threshold the effects are not amplified.
- d) On the other hand, the Ramazzini Institute studies were carried out for the entire life of the animals, instead, in the NTP they were sacrificed at 2 years, which determined that the animals that would die after that age could not be counted, which is equivalent in humans to 65 years.
- e) A body created by IRPA for Radioprotection cannot claim the right to discard these valuable studies and should as minimum have consulted experts from IARC or UNSCEAR or at least should have organized a meeting with those responsible for both projects.

In conclusion, ICNIRP **discards** the relevant studies **without consulting** IARC or UNSCEAR experts or those responsible for the projects...! But it **does not provide scientific information** that allows demonstrating that NIRs are not carcinogenic

4) Research needs:

The document "*ICNIRP Statements Gaps in Knowledge for Guidelines*" recommends biological and medical research lines at different frequencies. CIPRACEM considers that there are two huge fields of research that have not been considered by the ICNIRP and are of fundamental importance, the EMF assessment tools and the Radioprotection methods for the different EMF scenarios.

a) Radiation from mobile phones seems to have effects on all biological species: bacteria, protozoa, plants, insects, amphibians, birds and mammals, and in some cases at doses that are several orders of magnitude lower than the established limits. Unlike ionizing radiation, "dosimeters" have not been developed to determine the potential for biological damage of a given EMF. What is usually measured is the Specific Absorption Rate (SAR) due to the increase in temperature but there are biological phenomena that are not necessarily proportional to the changes in temperature.

DNA alterations in somatic cells are one of the key events in the carcinogenesis process that can make it possible to evaluate the genotoxic activity of an external physical or chemical agent.

There are several species of plants, such as *Allium cepa*, *Vicia faba* root tips, and *Lens culinaris* that have been used to evaluate DNA damage, such as chromosomal aberrations, micronuclei, and alterations in the mitotic cycle. The *Allium cepa* test is now frequently used for general environmental monitoring and also to evaluate the effects of ionizing and non-ionizing radiation, and is also very inexpensive.

Advances in this area are considered important to have tools for biological evaluation of EMF.

b) Service companies and the general public must have the "technical tools" to reduce exposures in order to apply the precautionary approach and the optimization principle in all the scenarios that arise.

It can be mentioned that **the ICRP has the "Committee 4 of Application of the Commission's Recommendations", which works precisely on the development of Radioprotection tools**. The result of this philosophy with IR has allowed: the doses received by nuclear power plant personnel (NPP) have dropped by a **factor of 10** in recent years ...!, the doses received by a person who performs a study with computed tomography (CT) receive **10 times less** dose than was received by the same study 10 years ago thanks to the increased sensitivity of the detectors...! that the probability of an accident occurring at a nuclear power plant has decreased

by **2 or 3 orders of magnitude** in the last 20 years ... etc., etc. All of this has been achieved over the years by the continuous and coordinated action of Radiation Protection Specialists and Regulatory Bodies developing Radioprotection Systems and Criteria.

This is not the case of the ICNIRP, which **does not comply with the statutes by which it was created** where it is stated that it **“must develop protection criteria”** and **“recommend protection systems against NIRs”**.

c) Radioprotection systems must consider all scenarios and all possible situations

- **The use of multiple Radioprotection materials** (paintings, curtains and screens) to protect private and public spaces and rooms.
- **The creation of spaces and corridors protected with a Faraday cage in public places** so that people who wish to can protect themselves, such as closed areas without Wi-Fi and with an alternative to connect to the Internet by cable.
- The use of “directional local fields” that produce areas with Wi-Fi and areas without Wi-Fi, for example in streets with corridors with Wi-Fi and corridors without Wi-Fi.
- **The automatic shutdown of the Wi-Fi fields** from the network access points (routers) when they are not used by any user.
- **The on / off of cell phones and switch to airplane mode according to your need.**
- Etc, etc, etc.

e) There is a particular case that should be studied derived from the work of Geesink and Meijer (*“An integral predictive model that reveals a causal relationship between exposures to non-thermal electromagnetic waves and healthy or unhealthy effects”*). Geesink and Meijer performed the meta-analysis of 724 biomedical publications, from 1970 to 2020, that reported beneficial or harmful biological effects caused by non-thermal external EMF frequencies from ELF to THz. An additional analysis of 229 experiments confirms that non-thermal electromagnetic waves can induce significant changes in human cells.

In summary, **it has been experimentally determined that there are “healthy and unhealthy” frequencies** and this allows us to determine which are the least harmful frequencies for people's health. (For example, up to 80% of planned 5G frequencies belong to so-called harmful frequency bands)

In conclusion, **the research is not oriented to those fields that allow optimizing the exposure of people in order to reduce risks.**

5) Undue consideration of some Biological effects.

The document *“ICNIRP Guidelines for limiting exposures Appendix B: Health Risk Assessment (11 July 2018)”* says verbatim on page 8: *“There is a large body of literature concerning cellular and molecular processes that are of particular relevance to cancer. This includes studies of cell proliferation, differentiation and apoptosis-related processes, **proto-oncogene expression, genotoxicity, increased oxidative stress, and DNA strand breaks**. Although there are reports of effects of radiofrequency EMF on a number of these endpoints, **there is no substantiated evidence of health-relevant effects**”*.

- a) Observing the tremendous amount of scientific literature that demonstrates, for each of these effects, the important role in the causes of cancer, it is inexplicable that someone declares that they **are not relevant to health.**
- b) **CIPRACEM considers that affirming that DNA breaks, oncogenes expression, oxidative stress and genotoxicity is not evidence of damage to health differs from the criteria applied by the ICRP that uses precisely this information for the development of the Biological dosimetry used in Operational Radioprotection.**

- c) Given the existence of **synergy phenomena between ionizing and non-ionizing radiation**, as has been observed in laboratory animals (Ramazzini Institute), it is necessary to create joint working groups between ICNIRP and ICRP and for this reason it is necessary to agree on the criteria used to assess the different biological effects

In summary, the ICNIRP applies criteria for the evaluation of biological effects that are **very different from those used by ICRP**, which makes it difficult to carry out a possible joint work to study the cases of IR / NIR synergy.

6) The lack of specialists in radiation protection of EMF

Being a field in which different disciplines intervene, **it is vital to have specialists who can handle the physical, biological, dosimetric, medical, engineering and regulatory problems in an integral way**, in order to investigate and optimize the uses of EMF and achieve practical solutions and sustainable over time.

It is observed that in the case of the protection and control of ionizing radiation (IR), there are undergraduate and postgraduate training courses and certified experts in all countries (ERP, HP, RPA), Societies that group them, Federations that The national societies are linked (IRPA), a secretariat dependent on the United Nations (UNSCEAR) that is responsible for defining the cause / effect relationship based on research carried out in all countries, an International Commission that is responsible for issuing recommendations on Radioprotection (ICRP), an international organization that is in charge of proposing Norms and Procedures to implement the recommendations (IAEA), National Radiation Protection Authorities that regulate and control the use of IRs and periodic national, regional and international Congresses where biological effects are discussed of the IR, the Radioprotection criteria used and its application form.

The situation is very different in the case of non-ionizing radiation, despite its impact on the health of people, animals and the environment being even greater.

For this reason it is not easy to achieve better control and protection of people from EMF. (It's like trying to make medicine without doctors...!)

On the other hand, it is also important to achieve the **"training of the population"** in general so that it can take self-protection measures and avoid unjustified exposures and for this it is also necessary to have specialists in the control of EMF in order to that train the public.

It must be assumed that there are factors or reasons for not promoting the training of specialists in Radioprotection of EMF and this must be corrected as soon as possible by taking the necessary actions for the **creation of undergraduate and graduate degrees in all countries**. It should be noted that IR radiation protection specialists already have training and experience that could allow them to achieve adequate training in this field. The participation of the IRPA as well as the Radiological Protection societies in national and regional IRs can be of fundamental importance for the achievement of this objective, so it would be important to carry out the corresponding actions.

In summary, for the development of an effective Radiological Protection of EMF, **ICNIRP should take the necessary actions to achieve the training of specialists**.

7) IRPA Code of ethics

- a) The IRPA code of ethics (art.2) says that Members will not allow conflicts of interest or possible personal interests to compromise their judgment and professional advice and it should be noted that several ICNIRP members are, or were, also members of the Committee International Electromagnetic

Safety (ICES) of the IEEE. This is an organization in which the media and telecommunications industry and the military participate actively and openly. The former ICNIRP commission chair was a member of an ICES / IEEE committee and thanked ICNIRP president Van Rongen for enhancing the relationship between ICES and ICNIRP and for his willingness *“to discuss harmonization of ICNIRP guidelines and limits of IEEE”* exhibition. In short, **the limits are harmonized with an institution linked to tremendous economic and military interests while the ICNIRP / ICRP criteria are not harmonized as established in the statute of creation of ICNIRP**. CIPRACEM understands that belonging to an institution funded by the telecommunications industry and the military **represents a conflict of interest**. (A regulator cannot establish such close and permanent contact with the industries it is supposed to regulate.)

- b) The IRPA code of ethics (art.9) says: *“Professional reports, statements, publications or advice produced by members should be based on sound radiation protection principles and science”*. ICNIRP does not respect the principles of justification and optimization of Radioprotection that are based precisely on ethical principles.

In short, **ICNIRP members work together with the industry (IES / IEEE) to harmonize regulations and do not respect the Radioprotection principles that are established in the IRPA code of ethics**.

8) IRPA Guiding Principles for Radiation Protection on Stakeholder Engagement

a) The IRPA Guide dictates some general criteria **to establish a constructive dialogue and exchange of information** with those people or organizations that may be affected or exposed to radiation and therefore have interests that may be in conflict with the established regulations.

Some criteria are:

- Enable an open, inclusive and transparent stakeholder engagement process.
- Find and involve relevant stakeholders and experts.
- Respect and value the expression of different perspectives.
- Ensure that there is a regular feedback mechanism in place to inform and improve current and future stakeholder engagement processes.

In the case of Non-ionizing Radiations, **an open dialogue and exchange of information with interested parties is not established**, which generates conflicts with the scientific community and with some particularly affected groups, such as hypersensitive people.

b) These conflicts due to lack of communication and open dialogue generate, in some cases, extremely worrying situations that lead to attacks on antenna installations.

In summary, **it is recommended that ICNIRP develop a constructive dialogue and exchange of information with the scientific community and with those people or organizations that may be affected or exposed to radiation**.

9) Compliance with the Statute of creation of ICNIRP

On May 20, 1992, ICNIRP was created in Montreal, Canada, during the development of the IRPA General Assembly, for which an ICNIRP Statute was approved "whose effective compliance in some points will be analyzed below:

- a) ***“The Commission will present its formal recommendations on protection against NIRs for the IRPA Executive Council and IRPA Associated Societies to comment, prior to publication. The period for comments will be 90 days”***

This criterion has not been met.

- b) ***“The Commission will seek to establish relations with international and national organizations. It will collaborate where possible and mutually advantageous with international non-governmental organizations, including the ICRU and ICRP”.***

This criterion has not been met.

- c) ***“The election of members will be made taking into account an appropriate balance of expertise and the scientific independence of the members. Attention will also be paid to geographic representation”.*** (This has not been fulfilled and it must be considered **that there have not been in the composition of the ICNIRP representatives of Russia, China and India, countries that have made great scientific contributions and possess, and especially Russia, a tremendous and unique experience, has its own regulatory body (RNCNIRP)** and applies with precision and intelligence the principles of ICRP and the Principle of optimization of practices, having established Restriction values **100 times lower than those recommended by ICNIRP...!**

This criterion has not been met.

10) ICNIRP, climate change and global warming, (Paris Summit).

- a) Among the objectives of the creation of ICNIRP is the benefit of the environment and it is closely related to the unrestricted use of Wireless Communication that ICNIRP must regulate.
- b) CIPRACEM has consulted the information provided by some specialized organizations such as:
- The United States National Institute of Public Science and Policy (NISLAPP),
 - The German Federal Environment Agency (UBA) and
 - The Australian Telecommunications Energy Efficiency Research Center (CEET).

These 3 organizations coincide in affirming that "the pure wireless alternative" implies some damages and risks for the society in which we live that include:

- Greater complexity and therefore less reliability.
- Higher costs and lower transmission speed than a fiber optic line.
- Longer latency period than a fiber optic line.
- Insecurity, vulnerability and less resistance to storms, floods and fires.
- Vulnerability to radio-electric interference or obstacles (groves, walls, etc.)
- Sensitivity to cyber attacks and information theft.
- Lower efficiency and the consequent waste of unnecessary energy.
- Delays and loss of information due to congestion and blockages.
- Dependence on periodic updates due to obsolescence.
- Battery dependency and battery charging.
- Greater possibility of addictive dependence.
- Public health risks of carcinogenicity, neurotoxicity, sterility and deterioration of the immune system, among others.
- Increased risks to the environment, global warming, climate change, and wildlife.

- Greater possibility of military uses for weapons and guided missiles and increased risk of their inappropriate use by terrorist groups.

It is given as an example that **from 2012 to 2015 it went from emitting 6 million tons of CO₂ to 30 million tons. In other words, CO₂ production quintupled in just 3 years, which was equivalent to adding 5 million cars on the roads. Up to 90% of this consumption was attributable to wireless communication network technologies...!**

In summary, according to the opinion of specialized organizations, **damage to the environment is occurring that is not considered by the ICNIRP in its regulations.**

