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| **Radiocommunication Advisory GroupGeneva, 15-17 April 2019** |  |
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| **1 October 2018** |
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| ITU-T Study Group 5 |
| LIAISON STATEMENT FROM ITU-T SG 5 TO RAG on ITU Intersectoral Response to “ICNIRP Public Consultation of the Draft ICNIRP Guidelines on Limiting EMF Exposure (100 kHz to 300 GHz)” |
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| SummaryThe attached document presents the liaison statement from ITU-T to RAG on ITU Intersectoral Response to “ICNIRP Public Consultation of the Draft ICNIRP Guidelines on Limiting EMF Exposure (100 kHz to 300 GHz)”.Action requiredRAG is invited to note the activities of ITU-T SG 5 and provide feedback, as deemed appropriate. |

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| ITU logo | INTERNATIONAL TELECOMMUNICATION UNION**TELECOMMUNICATIONSTANDARDIZATION SECTOR**STUDY PERIOD 2017-2020 | SG5-LS65 |
| **STUDY GROUP 5** |
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| **Source:** | ITU-T Study Group 5 |
| **Title:** | LS on ITU Intersectoral Response to “ICNIRP Public Consultation of the Draft ICNIRP Guidelines on Limiting EMF Exposure (100 kHz to 300 GHz)” |
| **LIAISON STATEMENT** |
| **For action to:** | ICNIRP, ITU-D SG2 (Question 7/2) and ITU-R SG1 (WP 1C) |
| **For comment to:** | - |
| **For information to:** | TSAG, WHO, RAG |
| **Approval:** | ITU-T SG 5 meeting (Geneva, 21 September 2018) |
| **Deadline:** | N/A |
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| **Keywords:** | RF EMF exposure limits, ICNIRP guidelines, public consultation |
| **Abstract:** | The new ICNIRP guidelines are open for comments up to 9 of October 2018. ITU-R, ITU-T and ITU-D experts prepared the comments. The Annex of this LS is the ITU intersectoral response to the new ICNIRP guidelines. ITU-T SG5 has adopted the proposed response and the chairman of ITU-T WP 1/5 has uploaded the official ITU response to the ICNIRP consultation. |

The International Commission on Non-Ionizing Radiation Protection (ICNIRP) proposed changes to the existing ICNIRP 1998 EMF (electromagnetic fields) Guidelines. On 12 July 2018, ICNIRP board officially asked ITU to respond to its public consultation on the new guidelines before 9 October 2018. ITU-R Study Group 1 (SG 1) and specially Working Party 1C (WP 1C) monitoring experts and ITU-D SG2 participants were kindly asked[[1]](#footnote-1) to adjust the proposed comments in:

1. [ICNIRP\_RF\_Guidelines\_PCD\_2018\_07\_11](https://www.icnirp.org/cms/upload/consultation_upload/ICNIRP_RF_Guidelines_PCD_2018_07_11.pdf),
2. [ICNIRP\_RF\_Guidelines\_PCD\_Appendix\_A\_2018\_07\_11](https://www.icnirp.org/cms/upload/consultation_upload/ICNIRP_RF_Guidelines_PCD_Appendix_A_2018_07_11.pdf),
3. [ICNIRP\_RF\_Guidelines\_PCD\_Appendix\_B\_2018\_07\_11](https://www.icnirp.org/cms/upload/consultation_upload/ICNIRP_RF_Guidelines_PCD_Appendix_B_2018_07_11.pdf).

The Attachment to this LS contains detailed comments on how to improve the 2018 Draft ICNIRP Guidelines. After careful review and some changes, ITU-T Study Group 5 approved the response to ICNIRP consultation at its September 2018 meeting. As ITU-D-SG2 Q7/2 meets on 11 October 2018, and ITU-R WP1/C on June 2019, the chair of ITU-T Working Party 1/5 uploaded on-time at <https://www.icnirp.org/en/activities/public-consultation/index.html> the official inter- Sector ITU response to ICNIRP consultation.

Based on early coordination between ITU-T, ITU-D and ITU-R, ITU-T Study Group 5 inserted this phrase to the response: “ITU comments have been prepared by ITU-T Study Group 5 in cooperation with experts from ITU-D SG2 Q7/2 and ITU-R Working Party 1C on EMF measurements. ITU-D SG2 Q7/2 and Working Party 1C would be able to provide additional comments, if any, after their respective next meetings in October 2018 and June 2019”.

**Attachment: ITU comments on Public Consultation – ICNIRP Draft RF Guidelines, Appendix A and Appendix B.**



Dear Contributor,

Thank you for participating in the public consultation of the ICNIRP draft guidelines.

Please note that it is important that ICNIRP understands exactly the points that you are making. To facilitate our task and avoid misunderstandings, please:

* be concise
* be precise
* provide supporting evidence (reference to publication, etc.) if available and helpful.

**Please provide your details below as per the online form and the provision of the privacy policy**

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| Last name, first name: ITU | Email address: h.mazar@atdi.com, Fryderyk.Lewicki@orange.com | Affiliation (if relevant): Dr. Mazar- ITU intersectoral activities on RF-EMF; Dr. Fryderyk Lewicki- chair ITU-T WP 1/5  |
| If you are providing these comments officially **on behalf** of an organization/company, please name this here: ITU comments have been prepared by ITU-T Study Group 5 in cooperation with experts from ITU-D SG2 Q7/2 and ITU-R Working Party 1C on EMF measurements. ITU-D SG2 Q7/2 and Working Party 1C would be able to provide additional comments, if any, after their respective next meetings in October 2018 and June 2019  |

**Please complete the comments table:** Please use 1 row per comment. If required, please add extra rows to the table.

|  | **Document****(Guidelines, App A,****App B)** | **Line Number****#** | **Type of comment (General/ Technical/ Editorial)** | **Comment** | **Proposed change** | **Context** |
| --- | --- | --- | --- | --- | --- | --- |
| **1** | Guidelines | Line number | Technical |   |  | Explain the context of your comment. |
| **2** | Guidelines | Line number | Technical | Insert your comment. | Insert your proposed change. | Explain the context of your comment. |
| **3** | Guidelines | Line number | Technical | Insert your comment. | Insert your proposed change. | Explain the context of your comment. |
| **4** | Guidelines | Line number | Technical | Insert your comment. | Insert your proposed change. | Explain the context of your comment. |
| **5** | Guidelines | Line number | Technical | Insert your comment. |    |   |
| **6** | Guidelines | Line number | General | Insert your comment.  |   |   |
| **7** | Guidelines |   | Technical | Insert your comment. |   | Explain the context of your comment. |

|  | **Document****(Guidelines, App A,****App B)** | **Line Number****#** | **Type of comment (General/ Technical/ Editorial)** | **Comment** | **Proposed change** | **Context** |
| --- | --- | --- | --- | --- | --- | --- |
| **1** | Guidelines | 15–17, 430 | Technical | Nerve stimulation induces electric fields within the body, for frequencies up to 10MHz. ICNIRP 2010 provides also reference exposure levels in the frequency range from 100 kHz up to 10 MHz. It is unaccpteble that two ICNIRP 2010 and 2018 Guidelines provide different reference exposure levels for the same RF 100 kHz to 10 MHz. See specific comparison ICNIRP 2018 Table 4, (line 681) vs. ICNIRP 2010 Tables 3 and 4.   | ICNIRP should improve guidance and linkages between the two guidelines including title, frequency range, rationale and limits.  | It is not always clear which limits apply when the frequency is covered by both the ICNIRP (2010) and ICNIRP (2018) guidelines. ICNIRP should improve guidance and linkages between the two guidelines |
| **2** | Guidelines | 35–38 | Technical | Inserting ‘potential benefits and harms within the context of cultural norms‘ invites national guidelines, opposite to the global interest, to use worldwide guidelines.  | Change: ‘ICNIRP treats people exposed to radiofrequency EMF as a result of cosmetic treatments as subject to these guidelines, with ~~any~~ no decisions as topotential exemptions ~~the role of national regulatory bodies, which are better suited to weigh potential benefits and harms within the context of cultural norms~~.‘. | There is no scientific risk-difference from RF-EMF among diverse countries or cultures. The role of the ICNIRP 2018 is to provide international guidelines and not to enable every national regulator to invent its national limits. |
| **3** | Guidelines | 118 | Technical | It is not clear that the ‘EMF source‘ itself (cellular, broadcasting...) influences the complex patterns of fields inside the body.  | Change: ‘This results in complex patterns of fields inside the body that are heavily dependent on the EMF ~~source~~ transmitter and frequency‘ | RF signal is characterised by power, frequency, polarisation, modulation... The word source may mislead. ICNIRP 2018 should focus on EMF exposure, and not the source. See next 2 comments.  |
| **4** | Guidelines | 138 | Editorial | ICNIRP 2018 should refer to ‘absorbed power density (Sab) and not to ‘transmitted power density (Str)’. For example In line # 243 we read ‘absorbed radiofrequency power’ on Str context. | Change ‘~~transmitted~~ absorbed power density (S~~tr~~ab)‘ throughout the 2018 Guidelines.  | The basic ICNIRP restrictions should not refer to the transmitter power, but to the incident power or power absorbed by the human body. In line 373 ‘(Str) provides a measure of the power absorbed in tissue...’.  |
| **5** | Guidelines | 146 | Editorial | ICNIRP 2018 should refer to ‚‘absorbed energy density (Hab, in J m-2), and not to ‘transmitted energy density (Htr, in J m-2)‘. As the character H refers to magnetic field, it is proposed to use **J**ab for energy density. |  Change the definitions of ‘transmitted energy density (Htr, in J m-2) ‘ to ‘absorbed energy density (Jab, in J m-2)‘ throughout the 2018 Guidelines.  |  For clarity, the basic ICNIRP restrictions should not refer to the transmitted energy, but to the incident energy absorbed by the human body.  |
| **6** | Guidelines | 156 (Table 1) | Technical | The 2018 Guidelines include new quantity relative to ICNIRP 1998, ‘incident plane wave energy density (Hinc) (kJ m-2)’. Table 1 should define it. Some of the units are bolded (e.g., **Sinc**, **Htr** and **Str**),while others are not bolded (e.g.,SAand SAR). Morevore, the same page line line 152 we read ‘Sinc’.  |  Add a row in Table 1:‘Incident plane wave energy density‘‚‘Hinc ‘, ‘(kJ m-2)‘. Throughout the 2018 Guidlines and Appendixes, be consistent with **bold** characters.  |  **Consistency**. Why the unit of the energy density is once Hinc (kJ m-2) and then Htr radiant exposure (J m-2)? In addition it is not clear how to measure Hinc and Htr.  |
| **7** | Guidelines | 289 | General | ICNIRP 1998 basic restrictions include power density. Tables 5 and 6 in ICNIRP 1998 do provide power densities for frequencies above 10 MHz, till 300 GHz  |  Delete ‘ basic restrictions ...have traditionally been limited to frequencies below 10 GHz ~~(e.g. ICNIRP 1998)~~‘.  |  Even the title of ICNIRP 1998 details ‘up to 300 GHz. |
| **8** | Guidelines | 406–408, 510–511, 543–544, 730–731 | Technical |  ‘...exposure from any pulse, group of pulses, or subgroup of pulses in a train, delivered in t seconds, must not exceed the formulae/ threshold/ limits...‘ is problematic, as the sum of pulse, group of pulses, or subgroup of pulses may excceed the formulae/ threshold/ limits, even each pulse doesn’t exceed and is compliant. |  Add in all these lines ‘ ...exposure from any pulse, group of pulses, or subgroup of pulses in a train, as well as for thetotal (sum) of exposures, delivered in t seconds, must not exceed the formulae/ threshold/ limits‘.  | See Appendix A lines 467–469 clarifying the difference between any and total: ‘For example, if two, 1-second pulses are separated by 1 second, the limits provided by Eqns. 3.5-3.6 must be satisfied for each of the pulses, as well as for the total 3-second pulse-pattern interval‘.  |
| 9 | Guidelines | Sections 4.3.3.2 starting line 396, 5.1.5 line 533, 590 (Table 2), 601 (Table 3) | Technical | The formulas of Specific Absorption (SA) and local transmitted energy density (**Htr**) and the relation 1/100 (e.g. 354 and 3.54) are not clear, below and above 6 GHz: SA 500+354(t-1)0.5 J kg-1 vs **Htr** 5+3.54(t-1)0.5 kJ m-2. Difficult to compare the SA at 6 GHz – ΔF (e.g. 5.9 GHz) and  **Htr** at 6 GHz + ΔF (e.g. 6.1 GHz).  | Add: clarification examples to calculate SA and **H**tr, to show continuity at 6 GHz. Thus, as in Table 2, below 6 GHz SAR limits are used for head/torso and limb, but above 6 GHz Str limits are used.Table 3, below 6 GHz SA limits are used, but above 6 GHz **S**tr limits are used.  |  ICNIRP 1998 provides continuous exposure limits. ICNIRP 2018 is in general also continuous across frequencies. Continuity of exposures along frequency (around 6 GHz) is important to reduce confusion. Readers should understand parameters clearly. See next comment. |
| **10** | Guidelines | 590 (Table 2), and 601 (Table 3) | Technical | Table 2 uses SAR and **S**tr (≥ 6 minutes), but Table 3 uses SA and **H**tr (< 6 minutes); both refer to the same frequency range 400 MHz–300 GHz. How to check continuity at 6 minutes using the different Tables at 359 and 361 seconds? |  Add: Provide application examples to calculate for 360 seconds **S**tr in Table 2, and to calculate SA and **H**tr in Table 3.  | Continuity of exposures along time (around 6 minutes) is important to reduce confusion. The same examples may be used for this comment and the last comment on similar issue, continuity around 6 GHz. |
|   **11** | Guidelines |  601 (Table 3) | Editorial | ‘electric, magnetic and electromagnetic field‘ appears in the title, so no need to repeat it in the Tables. The Table‘s title ‘Basic restrictions for electric, magnetic and electromagnetic field exposure ...‘ doesn’t fit (Table 3) parameters and units of ‘SA (J kg-1)‘ and (kJ m-2) **Htr**‘.  | Change the title ‘Basic restrictions for ~~electric, magnetic and electromagnetic~~ ~~field~~ energy exposure‘. Or use throughout the Tables 3, 5 and 6 ‘EMF exposure‘ instead of ‘ electric, magnetic and electromagnetic field ‘. |  To differentiate among Tables. See similar comment in Table 5 and 6. The Tables‘ titles should be precise, or use a general concise term ‘EMF exposure‘.  |
| **12** | Guidelines | 643-649 | Technical | ‘...input from the compliance community is required to determine which of these fieldtypes is most appropriate for a given exposure‘. We find the present definitions of near and far-field exposure conditions appropriate. Therefore, a Reference, showing the applicability, provides the evidence for deletion. See next comment. | Add and Delete: line 646, „ ... to antennadiameter and wavelength respectively, in meters“ (Mazar, 2016, pp 206-207, ITU-T K.61). ~~However, due to a range of factors that impact on the degree to which these definitions are appropriate for application to the reference levels, input from the compliance community is required to determine which of these field~~~~types is most appropriate for a given exposure.~~ | The final version of ICNIRP Guidelines should not include such a sentence. No need of additional inputs from the compliance community. If there are additional inputs from the compliance community, add their appropriate text.  |
| **13** | Appendix A | 545-548 | Technical | ‘...input from the compliance community is required to determine which of these fieldtypes is most appropriate for a given exposure‘. We find the definitions appropriate. See last comment.  | Delete: A guide to potential definition of near- and far-field exposure conditions is provided in the main document~~, but it is expected that determination of such conditions for the application of~~~~reference levels would need to be guided by compliance standards organizations~~.  | The final version of ICNIRP Appendix A should not inlude such text. No need of additional inputs from the compliance community. If there are additional inputs from the compliance community, add their appropriate text.  |
| **14** | Guidelines | 646 | Technical | D is correct not only for circular/dish antennas; therefore, the definition should be improved. See (Mazar, 2016, p 206). | Change: antenna ~~diameter~~ maximum dimension and wavelength respectively (ITU-T K.61)...  | Diameter refers only to circles, and dish antennnas. |
| **15** | Guidelines | 649 | Technical | In the far-field the electric **E** and **H** magnetic field-strengths are related by **E=** **H**/*z*0 where *z*0 ≈120 π ≈ 377 (ohms). Moreover, the correct definition of ‘incident power density (Sinc)’ (W m-2) over a surface S is the projection of the real part of the Poynting vector on the normal to the surface, i.e. $ Sinc=Re(E×H^{\*})∙\hat{n}$ (see IEC TR 63170). | Add: in the end of line 649 or another place. In the far-field the electric **E** and **H** magnetic field-strengths are related by **E=** **H**/*z*0 where *z*0 ≈ 120 π ≈ 377 (ohms). Moreover, the correct definition of ‘incident power density (Sinc)’ (W m-2) over a surface S is the projection of the real part of the Poynting vector on the normal to the surface, i.e. $ Sinc=Re(E×H^{\*})∙\hat{n}$.(Mazar, 2016, pp 200–201, ITU-T K.61, IEC TR 63170 ).  | To exemplify, see Table 4 at f > 30–400 MHz for occupational  **E** = 61,  **H** =0.16 and for general public **E** = 28 and **H** 0.073. The relations between **E** and **H** are 377 and the ‘incident plane wave power density (Sinc) (W m-2) equals the product of **E** and **H**: 61 x 0.16≈ 10 and 28 x 0.073= 2, respectively.  |
| **16** | Guidelines | 675 | Editorial | Editorial mistake: one redundant parenthesis. | Correct: ~~(~~(Hirata et al., 2013).  |  *Errare humanum est* (Seneca).  |
| **17** | Guidelines | 681 (Table 4)  | Technical | Comparing reference exposure levels at 100 kHz: ICNIRP 2010, 3 kHz−10 MHz, **occupational** 170 V/m and 80 A/m (Table 3); **general public** 83 V/m and 21 A/m (Table 4).ICNIRP 2018, 100 kHz−20 MHz, **occupational** 1220/f(MHz) V/m and 4.9/f A/m; **general public** 560/f V/m and 2.2/f A/m (Table 4).To indicate the difference at 100 kHz: ICNIRP 2010, **occupational** 170 V/m and 80 A/m; **general public** 83 V/m and 21 A/m. ICNIRP 2018, **occupational** 1220/0.1(MHz) =12,200 V/m and 4.9/f=49 A/m; **general public** 560/f= 5600 V/m and 2.2/f= 22 A/m.  | ICNIRP should improve guidance and linkages between the two 2010 and 2018 guidelines including title, frequency range, rationale and limits.  | It is not always clear which limits apply when the frequency is covered by both the ICNIRP (2010) and ICNIRP (2018) guidelines. ICNIRP should improve guidance and linkages between the two guidelines |
| **18** | Guidelines | 681 (Table 4)  | Technical | Comparing reference exposure levels at 10 MHz: ICNIRP 2010, 3 kHz−10 MHz, **occupational** 170V/m and 80 A/m (Table 3); **general public** 83 V/m and 21 A/m (Table 4).ICNIRP 2018, 100 kHz−20 MHz, **occupational** 1220/f(MHz) V/m and 4.9/f A/m; **general public** 560/f V/m and 2.2/f A/m (Table 4). To indicate the difference at *10 MHz*: ICNIRP 2010, **occupational** 170 V/m and 80 A/m; **general public** 83 V/m and 21 A/m. ICNIRP 2018, **occupational** 1220/10(MHz)=122 V/m and 4.9/f=0.49 A/m; **general public** 560/f= 56 V/m and 2.2/f= 0.22 A/m.  | ICNIRP should improve guidance and linkages between the two guidelines including title, frequency range, rationale and limits.  | It is not always clear which limits apply when the frequency is covered by both the ICNIRP (2010) and ICNIRP (2018) guidelines. ICNIRP should improve guidance and linkages between the two guidelines , ICNIRP 2018 may indicate that ICNIRP 2010 rerference levels are not applicable above 100 kHz. |
| **19** | Appendix A | 588–591 | Technical | Nerve Stimulation induces electric fields within the body, for frequencies up to 10MHz. As ICNIRP 2010 provides also reference exposure levels in the frequency range from 100 kHz up to approximately 10 MHz, it is unacceptable that two ICNIRP 2010 and 2018 Guidelines provide different values for the same RF. Even that ICNIRP 2010 reference levels are set to protect against stimulation effects up to 10 MHz, and a reduction factor of 3 was applied to account for uncertainty associated with the numerical simulation, the proposed text should be added.   | ICNIRP should improve guidance and linkages between the two guidelines including title, frequency range, rationale and limits.  | It is not always clear which limits apply when the frequency is covered by both the ICNIRP (2010) and ICNIRP (2018) guidelines. ICNIRP should improve guidance and linkages between the two guidelines  |
| **20** | Guidelines | 681 (Table 4) | Technical | The values of electric **E** and **H** magnetic strengths below 30 MHz are not clear. At 20–30 MHz, for occupational  **E** = 61 V/m  **H** =4.9/*f* and for general public **E** = 28 V/m  **H** =2.2/*f* . Why **E** exposures are not function of *f*,similarly to **H**? Or inversly, why **H**  exposures are function of *f*? | Add: An explanation is missing.Maybe there is a mistake: at 20-30 MHz E=1220/*f* or H: 0.16? |  Even in the near-field  **E** and **H** are connected; see Maxwell equations (Mazar, 2016, pp 198–199). At ICNIRP 1998, between 10–400 MHz E and H are not dependent on *f*. However, at 1–10 MHz, E=87/*f*1/2 while H=0.73/*f1*. So, maybe no-change is needed, only some clarification. |
| **21** | Guidelines |  697 (Table 5) | Editorial | The Table‘s title ‘Reference levels for local exposure to time varying far-field electric, magnetic and electromagnetic fields, from 100 kHz to 300 GHz...‘ doesn’t fit parameters and units of ‘Incident plane wave power density (Sinc) (W m-2)‘  | Change the title ‘Reference levels for local exposure to time varying far-field ~~electric, magnetic and electromagnetic fields~~  incident plane wave power density exposure, from 100 kHz to 300 GHz...‘. Or use throughout the Tables 3, 5 and 6 ‘EMF exposure‘.  | To differentiate among Tables. See similar comment in Tables 3 and 6. |
| 22 | Guidelines | 707–708  | Technical | Table 5 (**S**inc≥ 6 minutes) ‘Note 3. For frequencies >400 MHz to 6 GHz, Table 6 reference levels averaged over 6 minutes are to be used (i.e. t = 360 seconds)‘. It is not clear how to compare at 6 minutes the **S**inc ≥ 6 minutes of Table 5 and the  **H**inc ≤ 6 minutes; by SAR (=SA/360)?  | Add: clarification examples for  **S**inc ≥ 6 minutes and **H**inc≤ 6 minutes to show continuity at 6 minutes in Tables 5 and 6; and for SAR, at t=360 seconds.  |  Continuity of exposures along time (around 6 minutes) is important to reduce confusion at t = 360 seconds. |
| **23** | Guidelines | 709 | Editorial |  Editorial mistake. |  Correct: (6~~6~~-30 GHz)  | *Errare humanum est* (Seneca). |
| **24** | Guidelines | 718 (Table 6) | Editorial | The Table‘s title ‘Reference levels for local exposure to time varying far-field electric, magnetic and electromagnetic fields, from 100 kHz to 300 GHz...‘doesn’t fit parameters and units of ‘incident plane wave power density (Sinc) (W m-2)‘ .  | Change the title ‘ Reference levels for local exposure to time varying far-field ~~electric, magnetic and electromagnetic fields~~  incident plane wave power density exposure, from 100 kHz to 300 GHz ...‘. Or use throughout the Tables 3, 5 and 6 ‘EMF exposure‘. |  To differentiate among Tables. See similar comment in Tables 3 and 5.  |
| **25** | Guidelines | 718 (Table 6)  | Editorial |  Editorial mistake: missing one parenthesis  |  Correct: 2.75f-0.177[2.5+1.77(t-1)0.5]  | *Errare humanum est* (Seneca). |
| **26** | GuidelinesAppendix A | 740 (Table 7)771 |  | The limb current reference levels at 100 mA and 45 mA, for occupational and general public exposures respectively‘the limb current reference levels at 100 mA and 20 mA, for occupational and general public exposures respectively’There is an inconsistency between the Guidelines Table 7 and Appendix A line 771. The reference level for the general public should be unified in both documents | Correct Appendix A: ‘the limb current reference levels at 100 mA and ~~20~~ 45 mA, for occupational and general public exposures respectively’ | In ICNIRP 2018 Guidelines, the rate between occupational and general public exposure is correct 100/45=√5, as 5 is the rate between powers, SARs and energies. In Appendix A line 771 , the current relation between occupational and general public exposure is incorrect 100/20=5. Moreover, it contradicts Appendix A line 779 ‘As shown in Eqn. 4.2, the local SAR is proportional to the squared value of the limb current‘. Lines 791–792 ‘the squared value of the limb current is proportional to the local SAR, the squared value of the limb current must be used for time averaging‘. |
| 27 | Guidelines | 753 | Technical | There are also large FM broadcasting transmitters at 87.5–108 MHz, the international FM radio broadcasting known as Band II.  | Add: large radiofrequency transmitters, such as are found near high power antennas used for broadcasting below 30 MHz and at 87.5–108 MHz. | Significant information. |
| **28** | Guidelines | 770 | Technical | The text ‘high-power radiofrequency fields as those emitting greater than 100 V m-1 at their source‘ is not clear! At which distance from the main beam is measured this field-strength?! More rational is to define the eirp of the transmitter, or better to define the field-strength 100 V m-1 as the exposure level. | Clarify: ICNIRP here defines high-power radiofrequency exposure fields as those ~~emitting~~ greater than 100 V m-1 ~~at their source~~.  | A general comment: throughout the Guidelines, ICNIRP should refer to the received and not the transmitted signal, as the Guidelines should provide exposure levels and not transmitters’ limits.  |
| **29** | Guidelines | 863 | Technical | The **H**inc is the incident energy density not field strength.  |  Improve: ...reference levels of ~~field strengths~~ incident energy densities should be applied.  |  Even that the ICNIRP 2018 title refers to ‘electric, magnetic and electromagnetic fields‘ the Guidelines should be precise.  |
| **30** | Guidelines | 948 | Technical | Insert three References, providing evidence to deleting and inserting text in the 2018 Guidelines and Appendix A. |  1) ITU-T Recommendation K.61: Guidance on measurement and numerical prediction of electromagnetic fields for compliance with human exposure limits for telecommunication installations’ 2)IEC TR 63170: Measurement procedure for the evaluation of power density related to human exposure to radio frequency fields from wireless communication devices operating between 6 GHz and 100 GHz3)Mazar H. Radio Spectrum Management: Policies, Regulations and Techniques. Wiley, 2016.  | These references explain the deletion of the sentence in Guidelines lines 646–649 and Appendix A lines 545–548. They also explain the antenna diameter (or its maximum dimension) Guidelines line 646. The References relate field-strengths E and H, and their vector product to get the ‘incident plane wave power density (Sinc), in Guidelines p. 649. |
| **31** | Appendix A | 633 | Editorial | The acronym ICRP is not specified | Add in line 633: ... the standard dimensions specified by International Commission on Radiological Protection (ICRP)...  | Consistency is important; acronyms and abbreviations should be specified. |
| **32** | Appendix B | 190 | Editorial | ... ‘specific absorption (SA) value of 4.5 mJ190 kg-1 per pulse to reach the 20 mPa auditory sound pressure threshold...’. The symbol mPa was not defined and is not obvious. | Add in line 190: ... ‘reach the 20 millipascal (mPa) auditory sound pressure threshold...  | Readibility. |

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1. See ITU-R Document [1C/176](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-WP1C-C-0176) 3 August 2018 on Question [239/1](https://www.itu.int/pub/R-QUE-SG01/publications.aspx?lang=en&parent=R-QUE-SG01.239), and ITU-D [SG2RGQ/18](http://www.itu.int/md/D18-SG02.RGQ-C-0018/) 6 August 2018 on Question [Q 7/2](https://www.itu.int/net4/ITU-D/CDS/sg/rgqlist.asp?lg=1&sp=2018&rgq=D18-SG02-RGQ07.2&stg=2). [↑](#footnote-ref-1)