



Reply to the attention of:

JUL 1 2015

Received & Inspected

JUL 13 2015

FCC Mail Room

Mr. Julius Knapp  
Chief  
Office of Engineering and Technology  
Federal Communications Commission  
445 12<sup>th</sup> St SW  
Washington, D.C. 20554

Dear Mr. Knapp:

Thank you for your recent letter requesting comments from the Occupational Safety and Health Administration (OSHA) on the FCC's *Notice of Inquiry*, dated March 29, 2013, regarding exposure limits and policies for radiofrequency (RF) emissions from FCC-regulated sources. We have reviewed the *Notice of Inquiry* and offer the following comments:

- RF emissions are not on OSHA's active regulatory agenda, so we have not conducted a comprehensive literature review or risk assessment on RF hazards. In light of the FCC's request for feedback on its *Notice of Inquiry*, however, we reviewed the FCC's existing RF occupational exposure limits and compared them to the recommended limits in relevant consensus standards. Our review indicated that the FCC's specific absorption rate (SAR) and maximum permissible exposure (MPE) limits for occupational exposures are fairly consistent with the current recommendations of the Institute of Electrical and Electronics Engineers (IEEE), the American Conference of Governmental Industrial Hygienists (ACGIH), and the International Commission on Non-Ionizing Radiation Protection (ICNIRP). We did identify some differences between the FCC's exposure limits and the limits in the consensus standards. For example:
  - The FCC's occupational localized spatial peak SAR of 8 W/kg (averaged over any 1 gram of tissue in the shape of a cube) for parts of the body other than extremities may be more protective, in some cases, than the IEEE's and ACGIH's corresponding SAR of 10 W/kg for frequencies between 100 kHz and 3 GHz (IEEE) or 100 MHz and 3 GHz (ACGIH) (averaged over any 10 g of tissue in the shape of a cube) and the ICNIRP's SAR of 10 W/kg for frequencies between 100 kHz and 10 GHz for the head and trunk (averaged over 10 g of contiguous tissue).
  - The FCC's occupational power density MPE limits are different than the recommended power density limits in the IEEE, ACGIH, and ICNIRP standards, as shown in the following table:

FCC			IEEE / ACGIH			ICNIRP		
Frequency (f, MHz)	Limit (mW/cm <sup>2</sup> )	Averaging time (min)	Frequency (f, MHz)	Limit (mW/cm <sup>2</sup> )	Averaging time (min)	Frequency (f, MHz)	Limit (mW/cm <sup>2</sup> )	Averaging time (min)
30 – 300	1	6	100 – 300	1	6	10 - 400	1	6
300 – 1,500	f/300 (f is frequency in MHz)	6	300 – 3,000	f/300	6	400 – 2,000	f/400	6
1,500 – 100,000	5	6	3,000 – 30,000	10	$33,878.2/f^{1.079}$	2,000 – 10,000	5	6
			30,000 – 300,000	10	$67.62/f^{0.476}$	10,000 – 300,000	5	$68/f_G^{1.05}$ (f <sub>G</sub> is frequency in GHz)

Despite these differences, we do not believe that there are any major deficiencies in the FCC’s current occupational SAR and MPE limits. However, we encourage the FCC to contact the National Institute for Occupational Safety and Health (NIOSH) for additional input. With respect to non-thermal health effects, the FCC might also want to contact the National Toxicology Program (NTP) of the U.S. Department of Health and Human Services, which is currently conducting toxicology and carcinogenicity animal studies on RF emissions from mobile phones (NTP 2014).

- With respect to the issues raised regarding evaluation methods for determining compliance with SAR limits (*Notice of Inquiry*, paragraph 246), we believe that, given the current lack of standard computational procedures, it would be very useful for the FCC to develop a technical supplement to OET Bulletin 65 for fixed evaluation (including SAR). Such a supplement should provide guidance and examples for the common situation in which multiple fixed sources are collocated in the same area (e.g., a rooftop).
- Regarding contact burns (*Notice of Inquiry*, paragraphs 225-228), we encourage the FCC to promote awareness of the potential for burns to occur when construction activities result in a structure being placed in a radiation field emanating from AM broadcast antennas. We believe that it would be beneficial for the FCC to “provide publically available maps showing areas where electric fields exceed 10 V/m from AM broadcast stations” (*Notice of Inquiry*, paragraph 226).

In addition to the *Notice of Inquiry*, we reviewed the *Report and Order* and the *Further Notice of Proposed Rulemaking* that accompanied the *Notice of Inquiry*, and we offer the following comments on those materials:

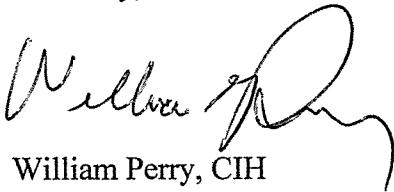
- We noticed that the FCC treats untrained occupational personnel as “transient” individuals in a controlled area (*Further Notice of Proposed Rulemaking*, paragraph 182), but does not include “third-party workers performing maintenance on the site for an extended period” in that same category (*Report and Order*, paragraph 76). We believe it would be helpful for the FCC to provide additional guidance on how to distinguish

between these two groups, as there appears to be considerable overlap. We are concerned about third-party workers (for example, employees of HVAC contractors) who have not received training in RF hazards and who may be unaware of RF exposures, particularly when they are working near RF sources on rooftops and building exteriors. We would like to open a dialog with the FCC on how to best ensure that third-party workers receive RF awareness training.

- Regarding signage, we strongly support the idea of a requirement for signs, maps, or diagrams to show where exposure limits are exceeded (*Further Notice of Proposed Rulemaking*, paragraph 182). However, we are concerned about the following language in proposed 47 CFR §1.1307(b)(2)(iii): “A label or small sign may be attached directly to the surface of an antenna within a controlled environment if it specifies a minimum approach distance where the occupational exposure limit is exceeded. If signs are not used at the occupational exposure limit boundary, controls or indicators (e.g., chains, railings, contrasting paint, diagrams, etc.) must designate the spatial regions where the occupational exposure limit is exceeded.” We do not believe that a small sign attached directly to the antenna would be sufficient to alert workers to the RF exposure hazard, as a worker could be exposed to RF hazards while approaching the RF source to read the sign. And we do not think the proposed language is clear in terms of where the required chains, railings, diagrams, or other indicators must be placed. We think the rule should more clearly state that a sign or other indicator must be posted at the occupational exposure limit boundary or at the access point to the antenna (ladder, roof access, chain, gate, etc). In addition, it is important for the FCC to require signage to be revised, as necessary, when additional RF sources are added to the site. For the case of multiple RF sources at a single site, we encourage the FCC to develop clear guidance on the appropriate procedures that should be used by licensees at that site to ensure compliance with FCC regulations.

We appreciate the opportunity to comment on these important issues that affect workers. If you have any further questions or concerns, please feel free to contact me directly at (202) 693-1950 or [perry.bill@dol.gov](mailto:perry.bill@dol.gov).

Sincerely,



William Perry, CIH  
Director  
Directorate of Standards and Guidance

## References

ACGIH. American Conference of Governmental Industrial Hygienists. Threshold Limit Values for Chemical Substances and Physical Agents. 2015.

ICNIRP. International Commission on Non-Ionizing Radiation Protection. ICNIRP Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields (up to 300 GHz). Health Physics. 74(4):494-522. 1998.

IEEE. Institute of Electrical and Electronics Engineers, Inc. Std C95.1-2005. IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. April 19, 2006.

NTP. National Toxicology Program. Cell Phone Radiofrequency Radiation Studies. Available online at [http://www.niehs.nih.gov/health/assets/docs\\_a\\_e/cell\\_phone\\_radiofrequency\\_radiation\\_studies\\_508.pdf](http://www.niehs.nih.gov/health/assets/docs_a_e/cell_phone_radiofrequency_radiation_studies_508.pdf). November, 2014.