Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Reassessment of Federal Communications Commission Radiofrequency Exposure Limits and Policies	)	ET Docket No. 13-84
	)	
	)	
Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields	)	ET Docket No. 03-137
	)	

COMMENTS OF THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION

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COMMENTS OF THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION

I. INTRODUCTION AND STATEMENT OF INTEREST

The Telecommunications Industry Association ("TIA")[1] hereby submits its comments in response to the Commission's First Report & Order, Further Notice of Proposed Rulemaking, and Notice of Inquiry ("R&O," "FNPRM," or "NOI") in this proceeding.[2] As the leading trade association for the information and communications technology ("ICT") industry, TIA applauds the Commission for initiating this review and reform of its equipment authorization processes and rules. Among other things, TIA members manufacture Wi-Fi, 3G, 4G, P25 wireless

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[1] TIA is a trade association based in the Washington, DC area which represents approximately 500 global information and communications technology ("ICT") manufacturers, vendors, and suppliers. TIA represents the global ICT industry through standards development, advocacy, business opportunities, market intelligence, and networking. TIA's member companies manufacture or supply the products and services used in global communications across all technology platforms. Since 1924, TIA has been enhancing the business environment for broadband, mobile wireless, information technology, networks, cable, satellite and unified communications. Members' products and services empower communications in every industry and market, including healthcare, education, security, public safety, transportation, government, the military, the environment, and entertainment. TIA is accredited by the American National Standards Institute ("ANSI"). TIA represents its members on the full range of public policy issues affecting the ICT industry and forges consensus on industry standards. Please see TIA's 2013 Policy Playbook, which provides an overview of the ICT market, technologies, and policies that drive innovation and investment. *See* http://www.tiaonline.org/policy/tia-2013-playbook.

[2] Reassessment of Federal Communications Commission Radiofrequency Exposure Limits and Policies, Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields, *First Report & Order, Further Notice of Proposed Rulemaking, Notice of Inquiry*, ET Docket Nos. 13-84, 03-137 (rel. Mar. 29, 2013) ("R&O," "FNPRM," or "NOI").

transmitters (small cell), and wireline products such as routers and switches, as well as cable set-top boxes. As a result, TIA's membership consists of manufacturers and vendors of a wide array of equipment regulated by the Commission.

We appreciate the Commission's focus and attention to the important issue of device certification, and its impact on manufacturers' and suppliers' ability to innovate. The FCC's device approval process helps ensure that non-compliant manufacturers and vendors do not gain an unfair competitive advantage over companies that develop compliant products. TIA's existing efforts to streamline the approval of devices are led by our Technical Regulatory Policy Committee ("TRPC"),[3] which meets several times each year with Commission lab staff to address device approval issues and to share information among stakeholders. TIA is also interested in this issue as an American National Standards Institute ("ANSI")-accredited standard developer for the telecommunications industry.

TIA also notes its existing efforts to work directly with the Telecommunications Certification Bodies ("TCBs"). TIA members, representing manufacturers and vendors of ICT, constantly work with TCBs to ensure the quality of submissions to the Commission's OET Labs. In addition, TIA is a liaison between the TCB Council[4] and the ICT manufacturer and vendor community. Each April and October, TIA presents emerging trends and issues to TCB Council members at the TCB Council Workshops.

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[3] TIA's TRPC advocates public policy positions related to the FCC equipment certification procedures through interaction with the Commission's Office of Engineering and Technology (OET) and the OET Laboratory, as well as other governmental bodies, including but not limited to those issues which are affected by related TIA standardization activities. *See* http://www.tiaonline.org/policy/tia-policy-committees-divisions.

[4] The TCB Council is a non-profit entity that provides a forum for periodic dialogue between the FCC and the TCBs and to facilitate on-going activities geared toward the improvement of TCB technical and administrative performance. *See* http://www.tcbcouncil.org/.

II. DISCUSSION

A. THE COMMISSION SHOULD GLOBALLY HARMONIZE ITS EXPOSURE STANDARD

In the NOI, the Commission seeks comment on "the preference, costs, and benefits of adopting any of the present or future standards being developed by IEEE, ICNIRP, or possibly by NCRP, keeping in mind the potential for international harmonization, the adequacy of supporting documentation, the differences in process and openness in development, and the technical completeness of each standard."[5] TIA believes that the Commission should harmonize its exposure standard with the internationally-accepted 2.0 W/kg averaged over 10 grams value. We base this assertion on: (1) the consensus views of expert health and safety organizations that have reviewed the existing scientific evidence, and (2) the economic benefits that result from the global harmonization of standards, as detailed below.

1. EXISTING SCIENTIFIC EVIDENCE SUPPORTS THE ADOPTION OF THE IEEE/ICNIRP EXPOSURE STANDARD

TIA strongly believes that the existing body of scientific evidence supports the adoption of the IEEE's C95.1 (2005)[6] exposure standard. The Commission adopted its present exposure limits in 1996, based on NCRP[7] and the IEEE C95.1 (1991) committee recommendations. In addition, ICNIRP developed its own standards and guidelines in 1998.[8] ICNIRP analyzed the science again in 2009 and concluded that "[r]esults of epidemiological studies to date give no

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5 *See* NOI at ¶ 214.

6 *See* Institute of Electrical and Electronics Engineers, Inc., *IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz*, IEEE Std C95.1-2005, copyright 2006 by the Institute of Electrical and Electronics Engineers, Inc. (IEEE), New York, New York 10016-5997 ("IEEE C95.1-2005").

7 *See* National Council on Radiation Protection and Measurements (NCRP), *Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields*, NCRP Report No. 86, Sections 17.4.1, 17.4.1.1, 17.4.2, 17.4.3 and 17.4.5, copyright 1986 by NCRP, Bethesda, Maryland 20814.

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

consistent or convincing evidence of a causal relation between RF exposure and any adverse health effect."[9] The Commission notes that both the IEEE and ICNIRP localized SAR limits are currently 2.0 W/kg averaged over 10 grams, while the Commission's existing localized SAR limit is 1.6 W/kg averaged over 1 gram.

We note initially that both the highly-regarded ICNIRP and the IEEE C95.1 2005 committees have reviewed the most recently-available scientific data and have found that the localized SAR threshold for an adverse health effect is 100 W/kg averaged over 10 grams of tissue. This is 50 times higher than the ICNIRP or IEEE standard of 2.0 W/kg averaged over 10 grams. As a practical matter, the ICNIRP standard is used almost universally internationally, with the United States remaining an outlier.[10]

The international community agrees that there is no credible evidence of health effects from RF radiation within the ICNIRP guidelines. The World Health Organization ("WHO") has stated as recently as 2011 that "[a] large number of studies have been performed over the last two decades to assess whether mobile phones pose a potential health risk. To date, no adverse health effects have been established as being caused by mobile phone use."[11] Other worldwide health and safety organizations in countries that have adopted the ICNIRP standard are in accord. For example:

- **UK Independent Advisory Group on Non-Ionizing Radiation (AGNIR)** (2012): "In summary, although a substantial amount of research has been conducted in this

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9 *See* International Commission on Non-Ionizing Radiation Protection (ICNIRP), Exposure to high frequency electromagnetic fields, biological effects and health consequences (100 kHz -300 GHz), 2009 (ICNIRP 2009) at 321.

10 *See* NOI at ¶¶ 213-215.

11 *See* WHO, *Electromagnetic Fields and Public Health: Mobile Phones*, Fact Sheet 193 (June 2011), available at http://www.who.int/mediacentre/factsheets/fs193/en.

area, *there is no convincing evidence that RF field exposure below guideline levels causes health effects in adults or children.*"[12]

- **Health Council of the Netherlands** (2013): "Based on the available epidemiological evidence described in this report and taking into account the quality of the different studies and their strengths and weaknesses, *the final conclusion from this systematic analysis is then, that there is no clear and consistent evidence for an increased risk of tumours in the brain and other regions in the head in association with up to approximately 13 years use of a mobile telephone*. For longer term use, for which no data are available, such risk cannot be excluded at present."[13]

- **Swedish Counsel for Working Life and Social Research** (2012): "Extensive research for more than a decade has not detected anything new regarding interaction mechanisms between radiofrequency fields and the human body and has found no evidence for health risks below current exposure guidelines. While absolute certainty can never be achieved, nothing has appeared to suggest that the since long established interaction mechanism of heating would not suffice as basis for health protection."[14]

- **Norwegian Institute for Public Health** (2012): "The studies have been performed on cells and tissues, and in animals and humans. The effects that have been studied apply to changes in organ systems, functions and other effects. There are also a large number of population studies with an emphasis on studies of cancer risk. *The large total number of studies provides no evidence that exposure to weak RF fields causes adverse health effects.*"[15]

- **Latin American Experts Committee on High Frequency Electromagnetic Fields and Human Health** (2010): "As judged from the available literature on oncogenesis-related cell function and exposure to low-level RF, the general conclusion is that there is, so far, inadequate evidence or lack of consistent and validated evidence, that such a cause-effect relationship can be established."[16]

- **European Commission, Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR)** (2009): "It is concluded from three independent lines of

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[12] http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317133826368 (2012) (emphasis added).

[13] http://www.gezondheidsraad.nl/sites/default/files/201311_Mobile_Phones_Cancer_Part1.pdf (emphasis added).

[14] http://www.fas.se/pagefiles/5303/10-y-rf-report.pdf (2011).

[15] http://www.fhi.no/dokumenter/545eea7147.pdf (2012) (emphasis added).

[16] http://www.wireless-health.org.br/downloads/LatinAmericanScienceReviewReport.pdf

> evidence (epidemiological, animal and in vitro studies) that exposure to RF fields *is unlikely to lead to an increase in cancer in humans.*"[17]

Further, as the Commission explains, "cell phones constantly vary their power to operate at the minimum power necessary for communications."[18] Therefore, the actual SAR value of the device in normal use is usually well below the maximum SAR value specified for the phone. Therefore, the consensus view among worldwide health and safety organizations supports the scientific basis for harmonizing the FCC exposure standard with the internationally-accepted value of 2.0 W/kg averaged over 10 grams of tissue. Therefore, TIA urges the FCC to adopt the IEEE C95.1 2005 exposure standard of 2.0 W/kg averaged over 10 grams of tissue.

2. GLOBALLY HARMONIZING THE EXPOSURE STANDARD HAS NUMEROUS SOCIETAL BENEFITS

There are significant societal benefits that the Commission can bring about by harmonizing the standard globally. The benefits of globally-harmonized standards touch all stakeholders: industry, governments, and—most importantly—consumers.

The INCIRP and IEEE standards draw on deep international expertise and experience. They are, therefore, a vital resource for governments developing regulations. International harmonization of the standard would provide societal benefits by facilitating international cooperation and enabling interoperability, which will open up trade.

TIA members are major importers and exporters of RF-emitting equipment. Requiring manufacturers to comply with differing sets of standards around the world creates potential barriers to trade in the ICT equipment market, particularly for small businesses. Harmonization would remove unnecessary trade barriers and open up global markets. A harmonized and

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[17] http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_022.pdf

[18] *See* FCC, *Wireless Devices and Health Concerns*, available at http://www.fcc.gov/guides/wireless-devices-and-health-concerns (last visited Aug. 20, 2013).

consistent approach has benefits in terms of protection and trade. TIA believes that globally harmonizing standards promotes the "build once, test once, sell everywhere" effect, resulting in improved time-to-market and reduced costs to consumers. This policy is also reflected in the National Technology Transfer and Advancement Act ("NTTAA"),[19] in which Congress directed all Federal agencies to use standards developed by voluntary consensus organizations as a means to carry out policy objectives or activities, as long as they are not inconsistent with applicable law or otherwise impractical; and in the Office of Management and Budget ("OMB") Circular A-119, requiring Federal agencies "to use voluntary consensus standards in lieu of government-unique standards except where inconsistent with law or otherwise impractical."[20]

Harmonizing the U.S. standard with the worldwide standard for exposure also avoids the inaccurate message that the U.S. needs a stricter standard than other countries. Such a message creates confusion, undermines public confidence in the safety of the technology, and is unnecessary.

Therefore, TIA supports the Commission harmonizing its exposure standard with the internationally-accepted 2.0 W/kg averaged over 10 grams value.

B. EXPOSURE STANDARDS FULLY PROTECT ALL POPULATIONS

The current FCC, IEEE, and ICNIRP standards all have been determined by the expert groups that developed them and by independent expert panels to provide a substantial margin of safety—up to fifty-fold—for users of consumer RF devices.[21] One reason for this substantial margin is to provide protection for all users, whether young, old or infirm. In essence, this

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19 *See* 15 U.S.C. §3701 et seq. (1996).

20 See OMB Circular A-119, available at http://www.whitehouse.gov/omb/circulars_a119.

21 *See, e.g.*, IEEE Standards Coordinating Committee 28 on Non-Ionizing Radiation Hazards, "IEEE Standard for Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 400 GHz," at 28 (Sept. 26, 1991).

existing margin constitutes a highly conservative operating precaution. The IEEE specifically states that its exposure standards "are intended to apply to all people." And as applied "to members of the general public, the lower tier provides more assurance that continuous, long-term exposure of all individuals in the population, will be without risk of adverse effects."[22] The IEEE's definition of "general public" includes "children, pregnant women, individuals with impaired thermoregulatory systems, individuals equipped with electronic medical devices, and persons using medications that may result in poor thermoregulatory system performance."[23]

Both the U.S. Food and Drug Administration and the World Health Organization have expressed confidence that the FCC and ICNIRP standards provide ample exposure limits for children:

> The scientific evidence does not show a danger to any users of cell phones from RF exposures, including children and teenagers.[24]
>
> Present scientific evidence does not indicate the need for any special precautions for the use of mobile phones. If individuals are concerned, they might choose to limit their own or their children's RF exposure by limiting the length of calls, or by using "hands-free" devices to keep mobile phones away from the head and body.[25]

Although the WHO language does provide some advice about limiting exposure, it first finds that there is no need for special precautions. The FDA is clear that there is no danger requiring special consideration for children.

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[22] IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz at 20 ("IEEE C95.1-2005").

[23] IEEE C95.1-2005 at 7.

[24] Food and Drug Administration, Radiation Emitting Products: Children and Cell Phones, available at http://www.fda.gov/Radiation-EmittingProducts/RadiationEmittingProductsandProcedures/HomeBusinessandEntertainment/CellPhones/ucm116331.htm (last visited Aug. 20, 2013).

[25] World Health Organization, Workshop on guiding public health policy in areas of scientific uncertainty, available at http://www.who.int.peh-emf/meetings/WHO_Final_workshop_report.pdf (last visited Sept. 3, 2013.)

Despite the views of the FDA and the WHO that there is no public health risk from mobile telecommunications, some groups continue to demand that the "precautionary principle" be invoked and that added measures be taken to further protect the young, old, and infirm. Additional precautionary measures are not needed. In the present case, the standards already provide for a substantial margin between the exposure limits and the levels where any health effects have been observed. This substantial margin inarguably constitutes a more than sufficient precaution. It is sufficient to protect all members of the public at large, including seniors and children. Given the current safety margins, there is no scientific rationale for additional safety margin—it simply is not needed.

C. AVERAGE TRANSMIT POWER DISCUSSION WITH RESPECT TO BOTH THE FNPRM AND NOI[26]

The technique of time averaging can provide flexible approaches to SAR compliance and aid in development of innovative products, applications, and services. Accordingly, the FCC should provide as expansive a definition as possible for "sourced-based" time averaging together with a time window consistent with either the ICNIRP[27] or the IEEE[28] standard—that is, either six or thirty minutes. Such a flexible definition would be predicated on current technological capabilities that enable a mobile device to identify its environment and control the power level of its transmitters in order to maintain SAR compliance.

Many applications for smartphones and tablets utilize short bursts of data transmission to support activities such as web browsing, sending emails, and downloading files. These devices

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[26] Because the FCC raised the matter of time averaging both in the NPRM and NOI, TIA urges FCC to address the issue in the NPRM in order to facilitate its use as soon as possible.

[27] ICNIRP 1998.

[28] IEEE C95.1-2005.

are used much less often for voice calls than traditional cell phones. In many instances, smartphone/tablet user experience and network performance is needlessly sacrificed because power is lowered for SAR compliance where average SAR would remain within compliant levels. Consequently, both user experience and product performance can be substantially improved by implementing time-averaging techniques.

A practical example of the effect of power limits in current devices can be seen with devices that use a proximity sensor to detect objects near the antenna. Such devices provide for reduced power close to the user's body in order to maintain compliance with SAR requirements. Power reduction is enforced regardless of the device's required transmission mode: power levels for short data transmissions (e.g., less than 5 seconds), such as for sending an email, is treated the same as power levels for a sustained voice/video call. Time averaging would allow flexibility through varied power levels that could increase connectivity for the short transmissions without a noticeable sacrifice in performance for longer calls.

Modern devices are capable of controlling the maximum transmit power for radios on an as-needed basis in order to maintain compliance with SAR requirements.[29] For example, during the transmission of an email message, a device may transmit at its maximum output power and then dynamically adjust its transmit power level, based on the device transmission requirements associated with user/device activity. It should be noted that, although this dynamic power management mechanism differs from 47 CFR Sec 2.1093 where a TDMA transmitter "on" or "off" duty cycle mechanism results in an average power less than the measured peak burst transmit power, the result is the same with respect to SAR: that is, a compliant average SAR value is achieved.

[29] *See*, *e.g.*, 3rd Generation Partnership Project, Technical Specification Group Radio Access Network, User Equipment radio transmission and reception 25.101 (release 12), 25.102 (release 11) (2013).

Because the reduction in transmit power is independent of user interaction, device integrated power control avoids the FCC concern regarding "behavior-based"[30] time averaging. By allowing manufactures to implement a device-controlled, source-based mechanism to control average power within a defined time window, compliance with the applicable RF exposure limits is demonstrated independent of user activity. Such a device could be used continuously by the user while it dynamically manages transmit power to comply with the SAR limit.

The essential factor for power averaging is the effective time period. The extant standards provide guidance: the IEEE standard calls for a thirty minute period,[31] and the ICNIRP standard calls for a six minute period.[32] Although both standards provide greater flexibility than current FCC requirements, adoption of the IEEE standard would afford manufacturers a wider range of options for development of innovative products. Thus, TIA recommends that the Commission adopt a thirty minute period.

D. THE COMMISSION SHOULD REFER ITS 1 MW BLANKET EXEMPTION TO THE KNOWLEDGE DATABASE (KDB) PROCESS

Regarding the 1 mW blanket exemption covered in paragraphs 121-26 of the NPRM, TIA notes that the exemption falls under the rubric of testing procedures. Indeed, paragraphs 121-26 analyze the exemption in terms of the impact of power levels on the need for testing in order to assure compliance with the standard. Given that the FCC, in its First Report & Order adopted March 27, 2013, expressly determined that testing procedures are more appropriately handled by KDBs, and not by the less flexible approach of a rulemaking, TIA urges the FCC to refer this issue to the KDB process and remove it from the rulemaking.

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30 *See* NOI at ¶ 223.

31 IEEE C95.1-2005 at 111.

32 ICNIRP 1998 at 511.

E. THE FCC SHOULD ADJUST THE MPE/SAR FREQUENCY RANGES AND INCORPORATE INDUCED EFFECT BASIC RESTRICTION REQUIREMENTS CONSISTENT WITH ICNIRP 2010 RECOMMENDATIONS

The FCC should incorporate induced electric field basic restriction requirements consistent with ICNIRP 2010 and lower the frequency ranges applicable to MPE compliance testing. The FCC recognizes that the current frequency ranges for RF exposure do not include all of the bands where wireless charging activities currently operate.[33] As wireless charging for low-power personal electronics devices proliferates and high-power wirelessly-charged electric vehicle systems are further developed, FCC RF exposure regulations should adapt to address these new technologies.

For both personal device and moving vehicle wireless charging systems, many of today's systems are being designed to operate at frequency ranges as low as 10 kHz, and as high as 10 MHz (and beyond). The Commission notes that the MPE and SAR regulations do not explicitly cover the full range of frequencies at which these systems operate, which is necessary to fully assess possible RF exposure events.[34] The FCC also does not require ICNIRP recommended assessment of induced electric field or induced current density specified in ICNIRP 1998.

To address these issues, the FCC should adopt basic restriction requirements for frequencies from 0 to 10 MHz, as defined in ICNIRP 2010. While SAR is defined for frequencies as low as 100 kHz, SAR testing is not mandated at these frequencies for the fixed/mobile device categories that include wireless charging systems. As documented in ICNIRP Recommendations, SAR is the appropriate RF exposure assessment metric above 10 MHz, but it is not the dominant exposure phenomenon below 10 MHz. Also, MPE assessment is

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[33] *See* NOI at ¶ 229.

[34] *See Id*.

not required below 300 kHz. Therefore, there is no assessment requirement for wireless charging systems that operate below 300 kHz in a fixed or mobile application. The FCC should revise the Rule Sections 2.1093 and 1.1310 Table 1 limits to address RF exposure for frequencies from 0 Hz to 10 MHz.

In sum, the FCC should adjust the MPE/SAR frequency ranges, add induced electric field basic restriction requirements consistent with ICNIRP 2010, and address future wireless charging systems that operate below 100 kHz.

F. THERE IS NO SCIENTIFIC JUSTIFICATION FOR MANDATING CONSUMER INFORMATION REGARDING RF EXPOSURE.

The Commission requests comment on several aspects of consumer information provided both by the FCC and by manufacturers: (1) information supplied by the FCC to the general public about RF exposure and to assist consumers in making decisions about reducing RF exposure, (2) information on network exposure, (3) information on how consumers can better access the FCC's website and check their personal device information on file there, and (4) information on what precautionary information device manufacturers should provide to consumers.[35] TIA addresses each specific request below.

1. GENERAL COMMENTS AND CONCERNS

There are several areas where manufacturers provide warnings to consumers, including potential harms from listening to music at high volumes, mishandling batteries, distraction while driving, and, in the case of children, swallowing a broken component. [36] All of these share an important characteristic: an identifiable harm that the consumer should avoid. In the case of RF exposure at the frequencies and power levels emitted from wireless phones, however, there is no

[35] *See* NOI at ¶¶ 231-234.

[36] *See, e.g.,* Motorola Mobility RAZR MAXX, Verizon User's Guide at 65-72; Samsung Galaxy Note II at 183-198; Apple iPhone5 (IOS 6.1) at 146-47.

such identifiable harm.[37] For that reason, careful consideration of the need for, and significance of, both the content of consumer information and the manner of its delivery to the public must be carefully evaluated.

TIA recognizes that the FCC's role includes responding to public concern about the safety of products utilizing the airwaves. However, where the relevant public health and safety and expert standard setting organizations indicate that there is no actual public safety risk from the products, the message needs to be delivered in a way that clearly expresses the level of safety and does not engender additional, and unwarranted public concern. TIA views the FCC's range of inquiry regarding consumer information as being on the verge of giving credence to areas of undue concern, particularly with regard to the questions about information for reducing RF exposure and the precautionary principle. TIA urges the FCC to be cautious about promoting the use of consumer information for reducing RF exposure and the precautionary principle: consumers often respond by believing there is a credible safety concern or else the issue would not be raised.[38]

As a general rule, the type of manufacturer-provided consumer information under discussion is best handled through voluntary action rather than mandates. Indeed, given the state of the science on RF exposure, mandates for such information may infringe on manufacturers'

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[37] *See supra* at II.A.1.

[38] *See* Wiedemann, P. M., Schuetz, H., Boerner, F., Clauberg, M., Croft, R., Shukla, R., Kikkawa, T., Kemp, R., Gutteling, J. M., de Villiers, B., da Silva Medeiros, F. N. and Barnett, J. (2013), *When Precaution Creates Misunderstandings: The Unintended Effects of Precautionary Information on Perceived Risks, the EMF Case. Risk Analysis*. doi: 10.1111/risa.12034 ("[P]ublic health authorities should not expect that the implementation of precautionary measures alone will strengthen trust in risk management and thus reduce risk perception. If the intention is to reassure the general public, simple reliance upon providing information about precautionary policies is likely to fail.").

First Amendment rights as applied to commercial speech, depending, of course, on the specific content of the mandate.[39]

Voluntary action provides manufacturers the flexibility needed to find the most useful mechanism for delivering the information, as well as the content most responsive to consumer demands. For example, the Mobile Manufacturers Forum (MMF) has developed basic SAR information that is provided in a "SAR Tick," which appears as follows:

www.sartick.com

This product meets the applicable FCC SAR guideline of 1.6W/kg when held against the head or at a distance of x.x cm or x/x of an inch from the body. The FCC SAR guideline includes a considerable safety margin designed to assure the safety of all persons, regardless of age and health. The specific maximum SAR values for this product can be found in the xxxx section of this user guide.

When using the product next to your body (other than in your hand or against your head), either use an approved accessory such as a holster or maintain a distance of x.x cm or x/x of an inch from the body to ensure your use is consistent with how the device is tested for compliance with FCC RF exposure requirements. Note that the product may be transmitting even if you are not making a phone call.

The members of the MMF have committed to use the SAR Tick and, therefore, consumers interested in SAR have the benefit of the uniform delivery of this voluntary information.

[39] *See, e.g., CTIA–The Wireless Ass'n*, 494 F. App'x at 753.

2. SPECIFIC COMMENTS

(a) FCC information regarding reducing RF exposure

As noted in the general comments, for the FCC to make public recommendations for how a user can reduce RF exposure carries a substantial messaging risk—that is, consumers are likely to develop the unfounded belief that there is a reason to be concerned about present levels of exposure and that they need to reduce exposure to be safe.[40] Consequently, any statements by the FCC about RF exposure reduction should lead with the clear message—of the type the FCC now provides[41]—that exposures within the current exposure standard pose no known health risk.

The FCC's current website messaging seems to have already incorporated such a point of view:

> The FDA, which has primary jurisdiction for investigating mobile phone safety, has stated that it cannot rule out the possibility of risk, but if such a risk exists, "it is probably small." Further, it has stated that, while there is no proof that cellular telephones can be harmful, concerned individuals can take various precautionary actions, including limiting conversations on hand-held cellular telephones and making greater use of telephones with hands-free kits where there is a greater separation distance between the user and the radiating antenna.[42]

This approach provides a clear message that there is no need for a consumer to take additional action, but, if he or she desires to do so, the FCC identifies specific measures that would be effective in reducing SAR. TIA notes that such messaging is more appropriate from a governmental body than from a manufacturer, since the information can be seen as imputing

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40 Supra at II.A.1.

41 *See* FCC, *Radio Frequency Safety: Frequently asked questions about the safety of radiofrequency (RF) and microwave emissions from transmitters and facilities regulated by the FCC,* available at http://transition.fcc.gov/oet/rfsafety/rf-faqs.html (last visited Aug. 20, 2013).

42 *Id.*

knowledge of an issue to the manufacturer.[43] For this reason, as well as the reasons set out in Section (d) below, TIA recommends that information regarding precautions should be exclusively the purview of the governmental agencies (*i.e.*, FCC and FDA) and manufacturers or other businesses should not be required to deliver it.

The FCC has asked how to ensure information about RF exposure should be made available to people with disabilities. TIA reiterates the point that information about exposure reduction is not appropriate. TIA, however, certainly supports accessible information on the FCC website and encourages providing the message set out above in accessible formats. Accordingly, TIA urges the FCC to stay the course with its messaging and avoid any additional statements or emphasis on either RF reduction or the precautionary principle.

(b) Information on network exposure

The FCC has asked what additional information regarding network exposure should be made available to the public. TIA notes that several websites currently provide such information, including the World Health Organization's site,[44] and the EMF Explained site.[45] In addition to the more comprehensive explanation about network exposure contained in the general information sites, there are specific statements about base station safety on ICNIRP's site[46] and the World Health Organization's site.[47]

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[43] *See, e.g.*, D. Davis, Disconnect, 217-18 (2010) where the author implies that the compliance information for body-worn measurements is a hidden safety warning.

[44] See WHO, Electromagnetic fields: Electromagnetic fields and public health, available at http://www.who.int/peh-emf/publications/facts/fs304/en/index.html (last visited Aug. 20, 2013) ("WHO EMF website").

[45] "EMF Explained" is a website developed and administered by the Australian Mobile Telecommunications Association, the Mobile Manufacturers Forum and the GSM Association. *See* http://www.emfexplained.info/. The information regarding network exposure may be found at http://www.emfexplained.info/?Page=24794.

[46] ICNIRP Statement on the "Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz)" (2009), at http://www.icnirp.de/documents/StatementEMF.pdf ("Epidemiological data on possible health effects of chronic, low-level, whole-body exposure in the far-field of radiofrequency (RF) transmitters are poor, especially because of lack of satisfactory individual exposure

The information on these sites provides substantial consumer information. TIA recommends that the FCC summarize the content for consumers and then provide links to those sites.

(c) Access to the FCC website

The FCC's website containing SAR values and testing information is a direct reflection of the FCC's procedures for product grant authorization. For that reason, the website information is organized around product platforms and is accessed through FCC ID information rather than the names of products in the consumer marketplace. Consumers will therefore, find the website difficult to navigate. TIA agrees in principle with the FCC that it would be helpful to consumers if they could more easily access the website's information. However, TIA cautions against steps that would either undermine the website's core purpose of capturing grant authorization information or would create additional burdens on manufacturers in order to receive product grants.

The main issue with the website seems to be that consumers need a convenient method of either converting a product name to an FCC ID or otherwise finding a means to search for their desired product. Rather than recommend a redesign of the website, TIA instead would prefer that the FCC work with the manufacturers to develop a system whereby the FCC's site could be cross-referenced using information from the manufacturers' sites. For example, most manufacturers currently provide SAR information for each product on their company sites. A consumer who seeks to verify that information on the FCC's site would need only to obtain the FCC ID from the manufacturer's site and then go to the FCC's site.

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assessment. The few studies with adequate exposure assessment did not reveal any health-related effects. Exposure levels due to cell phone base stations are generally around one-ten-thousandth of the guideline levels.").

[47] *See* WHO EMF website.

The above approach has the merit of the FCC avoiding the need to develop a means of determining all possible consumer product names that could fall under a specific FCC ID. Such an effort would not only require considerable ongoing activity, but, no doubt, would create new issues when inevitable errors are made. Refinements to the approach could be made on an ongoing basis, such as voluntary links between individual manufacturers and the FCC's site.

(d) Precautionary information provided to consumers

As stated above, TIA has significant concerns regarding requirements that precautionary information be provided to consumers. With no identified risk of harm to consumers, and with the FCC having adopted the current standard after consultation with the governmental health experts,[48] TIA believes that precautionary information is uncalled for and runs counter to the confidence consumers should properly have in the safety of FCC-approved wireless technology.

There is already sufficient precaution built into the standard. The U.S. government confirmed this precaution in the recent Government Accounting Office ("GAO") Report that found that the FCC guideline is "a fiftieth" of this SAR threshold for an adverse health effect and therefore no additional margin for precaution is needed.[49] Significantly, similar levels of protection are provided under the ICNIRP standard, so there is no need for added precaution under ICNIRP any more than under the current FCC standard.[50]

Moreover, as a practical matter, recent analyses of actual exposure conditions demonstrate that the systems currently operate to provide exposures well below that expected by

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[48] The Commission notes that it will continue to work with the federal Radiofrequency Interagency Work Group (RFIAWG) on these issues moving forward. *See* R&O at ¶ 50.

[49] *See* GAO, Telecommunications: Exposure and Testing Requirements for Mobile Phones Should Be Reassessed, GAO-12-771 (Washington, D.C.: July 24, 2012) at 16-19.

[50] *See* IEEE C95.1-2005, Annex C.6 Safety factors and uncertainty factors; ICNIRP's 2009 Statement On The "Guidelines For Limiting Exposure To Time-Varying Electric, Magnetic, And Electromagnetic Fields (Up To 300 GHz) at http://www.icnirp.de/documents/StatementEMF.pdf.

users who refer to reported SAR levels. A recent Swedish study found that after assessing output power from more than 800,000 hours of voice calls, the average level for 3G or smartphone voice calls was below 1mW across all environments, including rural, urban, and dedicated indoor networks.[51] Similarly, an earlier French study found that a phone used in an urban environment typically operates at less than one percent of its maximum power[52]—which equates to 100 times less emissions than maximum reported SAR levels.

Given the lack of sound scientific evidence of harm to consumers from RF exposure conditions that are within the standard, under basic principles of freedom of commercial speech the FCC would have no basis for compelling companies to provide precautionary information.[53] This point is fully covered in the CTIA comments on commercial speech, which TIA fully adopts.

G. FURTHER COMMISSION ACTION IN THE AREA OF GENERAL TECHNICAL REQUIREMENTS TO ADDRESS EXPOSURE REDUCTION IS UNNEEDED

The NOI seeks comment on whether any general technical approach to reduce exposure further is appropriate or feasible.[54] TIA does not believe that any further technical approaches toward reducing further exposure is appropriate because: (1) the standards are threshold-based, (2) the standards are based on conservative assumptions, and (3) due to market effects that result from manufacturers striving for further battery life than their competitors, exposure reduction is occurring as newer RF-emitting ICT products evolve to meet consumer needs.

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51 Persson, T., Törnevik, C., Larsson, L.-E. and Lovén, J. (2012), Output power distributions of terminals in a 3G mobile communication network. Bioelectromagnetics, 33: 320–325. doi: 10.1002/bem.20710 ("Swedish Study").

52 Gati et.al., *Exposure induced by WCDMA Mobile Phones in Operating Networks*, IEEE Transactions on Wireless Communications Vol. 8, No. 12 (Dec. 2009).

53 *CTIA-Wireless Ass'n v. City & Cnty. of San Francisco, Cal.*, 494 F. App'x 752 (9th Cir. 2012).

54 *See* NOI at ¶¶236-38.

First, as the Commission recognizes in the NOI, the Commission's exposure limit is a "bright line" rule that is threshold-based.[55] In other words, if a device satisfies the FCC's standard, it is safe for consumer use, regardless of how close or far away it is from the "bright line." To introduce any sort of tier to this would muddle the straightforward value of the "bright line" standard and would unnecessarily create general confusion as to whether a device is "safe" for use.

Second, both the IEEE and ICNIRP exposure standards have been developed over many years and are based on very conservative assumptions. For example, the IEEE standard's safety margin is set at a range of 10 to 50 in power for the upper tier basic restrictions ("BRs") or maximum permissible exposures ("MPEs").[56] In addition, each feature of the Specific Anthropomorphic Mannequin ("SAM") is designed to reflect conservative assumptions in testing and evaluation. Such features include the head size, the phantom shape, the properties of the head tissue-equivalent liquid, and the pinna shape, orientation, and thickness.[57] Furthermore, the actual SAR value of the device while in normal use is usually well below the maximum SAR value specified for the phone.[58] For these reasons, no legitimate safety-based justification exists for further Commission action to further reduce exposure.

Third, because manufacturers compete to provide the longest battery life, there is a competitive impetus to reduce RF exposure. Mobile phones operate most efficiently when the

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55 *See* NOI at ¶ 236.

56 *See* IEEE C95.1-2005.

57 *See* Beard, B.B., Kainz, W., Onishi, T., Iyama, T., Watanabe, S., Fujiwara, O., et al., "Comparisons of computed mobile phone induced SAR in the SAM phantom to that in anatomically correct models of the human head," *IEEE Trans. Electromagn. Compat*., vol. 48, no. 2, at 397–407 (May 2006); Christ, A., Gosselin, M.C., Christopoulou, M., Kuhn, S., and Kuster, N., "Age-dependent tissue-specific exposure of cell phone users," *Phys. Med. Biol.*, vol. 55, at 1767–1783 (Mar. 2010); Hadjem, A., Conil, E., Gati, A., Wong, M.F., and Wiart, J., "Analysis of power absorbed by children's head as a result of new usages of mobile phones," *IEEE Trans. Electromagn. Compat*., Vol. 52, No. 4, at 812–819 (Nov. 2010).

58 *See, e.g.*, Swedish Study.

user absorbs no RF. Because users demand increased battery efficiency, competitive factors have and will continue to result in reduced exposure. Improved efficiency to form factors, antenna design and performance, and other aspects of technology in RF-emitting equipment translate to increased consumer preferences and reduced RF exposure. Industry members have long been working together to standardize some of these aspects; for example, for both 1x and high rate packet data ("HRPD"), TIA has developed standards which address design requirements to control the output power level to be just enough to achieve the required data rate through, while avoiding unnecessary interference.[59]

H. THE COMMISSION SHOULD RELY ON STANDARDIZED METHODS OF COMPUTATIONAL EXPOSURE EVALUATION

In the NOI, the Commission requests input on computational versus measurement evaluation, related standardization, and whether a related technical supplement to OET Bulletin 65 should be developed.[60] With respect to computational evaluation of exposure, TIA supports the approach of using the numerical techniques to reduce the complexity and cost of evaluation, while recognizing the importance of standardization of such methods. The computational methods are particularly helpful where the realistic exposure conditions are difficult—if not impossible—to replicate in measurements, especially for SAR evaluations. TIA supports the development of the related numerical assessment standards currently underway within the IEEE and IEC.

Besides the numerical methodologies, the development of these standards includes definition of the realistic anatomically correct human body models suitable for SAR evaluations

[59] *See* TIA-2000.1-F to TIA-2000.5-F; *see also* TIA-856.100-C-1 to TIA-856.500-C-1.

[60] *See* NOI at ¶¶ 244-247.

when used according to the standardized procedures therefore addressing FCC comments regarding the conservativeness and reliability of the results.

While a technical supplement to OET Bulletin 65 may be appropriate, TIA does not believe that OET Bulletin 65 (or its Supplements) should be mandated as proposed in the NOI.[61] Such an approach would undercut the nature of OET bulletins, which is to provide non-binding policy statements on the procedures available for demonstrating compliance, while allowing for the flexibility of other approaches. Additionally, this could potentially implicate technology neutrality issues in compliance.

I. FURTHER CHANGES TO PROXIMITY RESTRICTIONS ARE NOT NEEDED

The FCC has asked for comment regarding the need for decreasing the current body-worn spacing distance to some lesser distance, or perhaps to zero.[62] This inquiry stems from the empirical observation that consumers use mobile phones in various positions, including close to the body, together with an apparent impulse to have testing procedures mimic certain types of consumer use.[63] Therefore, the inquiry raises two concerns: (1) whether the substance of the inquiry itself is reasonable given the extant science; and (2) whether the inquiry is inappropriate given the clear direction in the R&O where the FCC Lab was granted the flexibility to address testing procedures that were previously covered by Supplement C. It is certainly an anomaly, if not a contradiction, for the FCC to grant the Lab flexibility under the R&O and then issue an NOI asking whether inflexible testing rules should be enacted.

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61 *See* NOI at ¶ 246.

62 *See* NOI at ¶ 251.

63 *Id.*

In posing the question in the NOI, the FCC has made the significant observation that current testing conditions, including body-worn spacing, pose no safety risk during actual consumer use of products:

> [E]xceeding the SAR limit does not necessarily imply unsafe operation, nor do lower SAR quantities imply "safer" operation. The limits were set with a large safety factor, to be well below a threshold for unacceptable rises in tissue temperature. As a result, exposure well above the specified SAR limit should not create an unsafe condition. . . . We also realize that SAR measurements are performed while the device is operating at its maximum capable power, so that given typical operating conditions, the SAR of the device during normal use would be less than tested. . . . [A] use that possibly results in non-compliance with the SAR limit should not be viewed with significantly greater concern than compliant use.[64]

In short, the FCC has noted that current testing procedures do not precisely mimic consumer use, but—given the ample safety factor in the standard—those current procedures are sufficient for assuring consumer safety.

Significantly, the FCC has not asked whether there is a need for testing to accurately mimic all possible consumer use conditions. Rather, the FCC has asked the more salient question of whether there are conditions that should be tested due to a possible safety issue:

> Given the considerable safety margin in our requirements, would the potential number of occurrences resulting from inattention to manual instruction and the extent of resulting exposure constitute a health hazard?[65]

Presumably, changes in testing should only be required if there were a negative answer to the FCC's question. As discussed below, however, there is no basis for concern from the current procedures, and the cost of changes would be significant.

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[64] *See* NOI at ¶ 251.

[65] *See* NOI at ¶ 252.

In framing the body-worn testing question in the NOI, the FCC has recognized the distinction between compliance testing and safety testing. The FCC notes that devices that have been tested to meet the compliance standard provide the user with an ample safety margin to accommodate the various possible use conditions. Accordingly, the threshold of the standard should be considered a compliance threshold and not a safety level beyond which a consumer is at risk. Moreover, the FCC has explicitly pointed out in the NOI that mobile phones typically operate well below the maximum power level where they are tested even where a consumer is "using a device without a spacer."[66]

Nevertheless, the FCC has asked for comment on the pros and cons of reducing the body-worn distance. At the outset, it must be noted that reducing spacing to zero would present testing and design issues for mobile phones. A phone's antennas perform best when the antennas are not directly adjacent to a body, due to dielectric loading from the body. For this reason, performance is compromised as a phone approaches zero separation. Thus, testing procedures that are revised and reoriented toward decreased spacing will compel redesigned products that either: (1) have shorter ranges for optimum performance, or (2) have features that limit performance capabilities by limiting power and/or transmissions when the product is being carried on the body. Neither approach leads to products that provide a desirable consumer experience. Given that there is no basis for concern about a health risk from the current allowable spacing, there is no need for the consumer to make such performance sacrifices.

Elsewhere in the FCC's NPRM and NOI, the FCC set out the importance of moving away from the regulatory inflexibility embodied in Supplement C to OET Bulletin 65.[67] The rationale turns on the importance of permitting the FCC Lab discretion to review testing

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66 *See* NOI at ¶ 251.

67 *See, e.g.*, R&O at ¶¶ 37-41.

requirements and adapt them to changing circumstances. The present inquiry directly conflicts with the principle of discretion adopted by the FCC in its Report and Order abolishing Supplement C by selecting a testing procedure for additional treatment through the NOI and, potentially, a subsequent rulemaking. Such a departure from the path of using the KDB process to maintain current testing procedures is both arbitrary and ill-advised. There is no scientific basis for special concern about spacing requirements, and, therefore, no reason to single such requirements out for treatment under a rulemaking.

Given that there is no health or safety rationale for reducing the allowable spacing for body-worn testing, and given that significant policy considerations favor the use of adequate spacing, TIA urges the FCC to avoid imposing additional regulatory testing procedures through a rulemaking. TIA further urges the FCC to continue to follow its chosen path of keeping testing procedures within the purview of the FCC Lab.

Finally, regarding the Commission's invitation for comment as to what steps, if any, the Commission should take relative to policies for device testing on the basis of an expectation of some separation from the body, including whether it is appropriate to consider "zero" spacing, or actual contact with the body when testing,[68] TIA believes that, as part of future discussion, the FCC should also publish the basis and qualify the rationale for any required evaluation separation distances for both portable (*e.g.* smartphone or tablet) and mobile (e.g. wireless charging pads) devices.

[68] *See* NOI at ¶ 252.

III. CONCLUSION

We thank the Commission for its public consultation and urge the careful consideration of the positions of the ICT manufacturer and vendor community offered herein as the agency proceeds in its efforts to improve the device approval process.

Respectfully submitted,

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