COMMENTS OF THE INFORMATION TECHNOLOGY INDUSTRY COUNCIL (ITI)

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Request for Information on Electromagnetic Fields (EMFs), Radiofrequency (RF) Radiation, and Wireless Radiation Exposure

Docket No. HHS-OASH-2026-0397

I. INTRODUCTION

The Information Technology Industry Council (ITI) appreciates the opportunity to provide comments to the U.S. Department of Health and Human Services (HHS) in response to its Request for Information (RFI) on electromagnetic fields (EMFs), radiofrequency (RF) radiation, and wireless radiation exposure.

The Information Technology Industry Council (ITI) is the premier global advocate for technology, representing the world's most innovative companies. Founded in 1916, ITI is an international trade association with a team of professionals on four continents. We promote public policies and industry standards that advance competition and innovation worldwide. Our diverse membership and expert staff provide policymakers the broadest perspective and thought leadership from technology, hardware, software, services, and related industries. Our members develop and manufacture a broad range of products and technologies that use RF energy, including mobile and wireless devices, computers, networking equipment, Internet of Things (IoT) devices, wearable technologies, wireless medical technologies, and other connected products and infrastructure. These connected technologies and multi purpose wearables play an increasingly vital role in public health by enabling continuous physiological monitoring, early detection and management of chronic conditions, telehealth access in underserved communities, and preventive wellness. Any evaluation of practical strategies to reduce exposure must weigh these substantial clinical and public health benefits alongside the established safety of low power RF emissions.

ITI supports HHS's objective of ensuring that federal health policy concerning RF/EMF exposure is based on rigorous scientific evidence, transparent risk assessment, and appropriate consideration of real-world exposure conditions. We also support continued research into areas where scientific uncertainty remains. At the same time, it is important that federal agencies distinguish between:

1. a biological effect and an adverse health effect;
2. hazard identification and risk assessment;
3. theoretical or maximum exposure and representative real-world exposure;
4. individual experimental findings and conclusions supported by the totality of scientific evidence; and
5. scientifically justified exposure requirements and precautionary measures that may not be supported by evidence of a corresponding health risk.

ITI encourages HHS to consider established national and international scientific and regulatory frameworks, including the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines, Institute of Electrical and Electronics Engineers (IEEE) standards, and the existing U.S. federal framework administered by the Federal Communications Commission (FCC) and informed by other federal agencies. ICNIRP's 2020 RF Guidelines address human exposure to RF electromagnetic fields from 100 kHz to 300 GHz and expressly encompass technologies including 5G, Wi-Fi, Bluetooth, mobile phones, and base stations.[1] IEEE C95.1-2019 establishes exposure limits for electric, magnetic, and electromagnetic fields from 0 Hz to 300 GHz, with limits intended to protect against established adverse health effects.[2]

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[1] ICNIRP RF EMF Guidelines 2020 at https://www.icnirp.org/en/publications/article/rf-guidelines-2020.html
[2] IEEE C95.1-2019: IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz at https://standards.ieee.org/ieee/C95.1/4940/

ITI recommends that HHS use the RFI process to promote a scientifically rigorous, internationally consistent, and technology-neutral framework that protects public health while supporting innovation, deployment of advanced wireless technologies, and predictable regulatory requirements.

II. RESPONSES TO QUESTIONS

Question 2: Perspective Represented

ITI submits these comments as an industry group representing technology manufacturers and related companies, including companies involved in the design, manufacture, development, deployment, and use of products and technologies that incorporate RF communications. ITI's comments primarily reflect the perspectives of equipment and product manufacturers and the broader technology industry. They are informed by technical standards, regulatory frameworks, scientific assessments, and the practical experience of companies that design and manufacture products subject to RF exposure requirements in the United States and international markets.

Question 3: Public Experiences and Reported Potential Adverse Health Effects

ITI does not represent individual consumers or patients and therefore does not have a body of clinical or individual health-experience data to submit in response to this question. ITI nevertheless recognizes the importance of appropriately considering reports of potential adverse health effects associated with RF/EMF exposure. Such reports can be useful for identifying questions for further scientific investigation. At the same time, individual reports should be evaluated using appropriate scientific methods before conclusions are drawn concerning causation. In particular, assessments should consider:

- the characteristics and magnitude of the reported exposure;
- the frequency and duration of exposure;
- distance from the source;
- relevant RF frequencies and field characteristics;
- other simultaneous sources of exposure;
- temporal relationships;
- potential confounding factors;
- objective exposure measurements, where available; and
- whether the reported association has been replicated through appropriately designed epidemiological or experimental studies.

ITI encourages HHS to distinguish reports of symptoms or other health outcomes that occur following an exposure from evidence demonstrating that the exposure caused those outcomes. Where individual or community reports identify potentially important questions, those observations can appropriately inform research priorities without being treated as establishing causality in the absence of supporting evidence.

Question 4: Clinical, Occupational, or Research Observations

ITI does not maintain a clinical surveillance system and therefore does not have clinical observations to report. ITI recommends, however, that HHS give appropriate consideration to standardized exposure assessment methodologies when evaluating reported health effects. Where exposure is an important component of an epidemiological or clinical investigation, reliable characterization of the exposure is essential to interpreting the resulting evidence. Studies should, where practicable, provide sufficient information concerning:

- frequency;
- power density;
- electric- and magnetic-field strength;
- specific absorption rate (SAR) or other appropriate dosimetric measures;
- exposure duration;
- duty cycle;
- distance from the source;
- proximity to the body;
- modulation and pulse characteristics; and
- simultaneous exposure to multiple RF sources.

Improved exposure characterization would help address an important methodological challenge: distinguishing associations with wireless technology use from associations with actual RF exposure.

Question 5: Exposure Standards, Guidelines, and Risk Assessment

A. National and international frameworks

ITI recommends that HHS consider, at a minimum, the following frameworks that provide important reference points for a science-based federal assessment.

- FCC RF exposure requirements: The FCC's current rules establish RF exposure limits and specify SAR and maximum permissible exposure methodologies for evaluating RF exposure. For example, 47 CFR § 1.1310 establishes general-population and occupational/controlled exposure limits and specifies SAR-based evaluation for relevant frequency ranges.[3]
- ICNIRP's 2020 Guidelines for limiting exposure to RF electromagnetic fields from 100 kHz to 300 GHz: ICNIRP's 2020 Guidelines were developed specifically to protect humans from RF exposure from 100 kHz to 300 GHz and incorporate updated dosimetry and evaluation of biological and health effects.
- IEEE C95.1-2019 and associated corrigenda: IEEE C95.1-2019 likewise establishes exposure limits over a broad frequency range, including both general-public and occupational environments.

B. Importance of harmonization

ITI strongly encourages HHS to consider the benefits of international regulatory harmonization. Technology products are developed and manufactured for global markets. Divergent exposure requirements, testing procedures, measurement methodologies, labeling requirements, or product-specific restrictions can result in unnecessary duplication of testing, additional compliance costs, delayed product introduction, reduced consumer access to and affordability of innovative technologies, and inconsistent treatment of technically equivalent products. Where scientific evidence supports a common approach, HHS should encourage consistency among U.S. federal agencies and with internationally recognized standards.

C. Risk assessment

ITI recommends that HHS use a weight-of-evidence approach that considers the totality of reliable scientific evidence. The assessment should distinguish the following steps:

> hazard identification → exposure characterization → dose/dosimetry →
> dose-response relationship → real-world exposure → risk characterization.

[3] 47 CFR § 1.1310 at https://www.ecfr.gov/current/title-47/chapter-I/subchapter-A/part-1/subpart-I/section-1.1310

Evidence that an effect can occur under an experimental condition should not automatically be interpreted as evidence that a corresponding adverse health risk exists under ordinary human exposure conditions.

D. Scientific, technical, or regulatory improvements

ITI supports continued improvements in:

- exposure measurement;
- dosimetry;
- computational modeling;
- characterization of near-field and far-field exposure;
- evaluation of higher-frequency technologies;
- multi-source exposure assessment;
- standardized testing procedures;
- and real-world exposure characterization.

HHS should coordinate closely with agencies that have regulatory authority and technical expertise concerning RF-emitting products, including the FCC and FDA.

E. Research needed to evaluate exposure standards

ITI supports additional research where meaningful scientific gaps exist. Research priorities should include:

- improved population exposure characterization;
- long-term epidemiological studies;
- occupational exposure;
- exposure from emerging technologies;
- higher-frequency RF;
- improved dosimetry;
- simultaneous or multiple-source exposures;
- reproducibility of experimental findings; and
- improved methods for translating experimental exposure conditions into realistic human exposure scenarios.

Research should be designed to inform exposure standards using measurable and reproducible endpoints.

F. Exposure classification

ITI agrees that RF exposure cannot appropriately be characterized using a single parameter. Relevant characteristics can include operating frequency, power density, SAR, electric- and magnetic-field strength, modulation, pulse characteristics, duty cycle, simultaneous exposure, duration, distance, proximity to the body; and cumulative exposure. However, these factors should be incorporated based on their scientific relevance rather than simply aggregated. For example, a cumulative exposure assessment should not assume that all RF sources operate simultaneously at their maximum permitted output or that exposure from different frequencies has identical biological significance. Exposure classifications should therefore be grounded in validated dosimetric relationships and actual exposure conditions.

Question 6: Evidence Regarding Adverse Health Effects at Current Exposure Limits

ITI recommends that HHS assess scientific literature using a comprehensive weight-of-evidence methodology. The assessment should include epidemiological studies, experimental animal studies, in vitro research, dosimetric

research, systematic reviews, and other relevant evidence, while appropriately considering study quality, reproducibility, exposure characterization, statistical significance, biological plausibility, and consistency across studies.

HHS should also distinguish between established adverse health effects at sufficiently high exposure levels and hypotheses concerning possible effects at substantially lower exposure levels. The World Health Organization (WHO) has noted that heating is the main established biological effect of RF fields and that current exposure guidelines are based on preventing adverse effects associated with excessive exposure. WHO has also stated that no adverse health effects from low-level, long-term exposure had been confirmed in its referenced assessment, while noting that research continues.[4] The FDA likewise states that the weight of scientific evidence has not linked cell-phone RF exposure with health problems and continues to monitor scientific and public-health information.[5] ITI recommends that HHS consider these and other authoritative assessments rather than relying on isolated studies.

Question 7: Methods for Characterizing Individual and Population Exposure

Several well-established methodologies are available for characterizing RF exposure. These include:

- SAR measurement;
- incident power-density measurement;
- electric- and magnetic-field measurements;
- computational dosimetry;
- near-field and far-field measurements;
- personal exposure monitors;
- environmental monitoring;
- network and device operating data;
- and statistical exposure modeling.

For consumer wireless devices, SAR measurement and computational methods are established components of regulatory compliance. IEEE and IEC have also developed measurement methodologies for wireless devices, including standards addressing SAR and power-density assessment at higher frequencies. IEEE's standards portfolio includes IEC/IEEE 62209-1528 for SAR assessment of hand-held and body-worn wireless devices and IEEE/IEC 63195 for power-density assessment from 6 GHz to 300 GHz.[6]

Population exposure assessment may require combining measurements with information concerning device usage, network characteristics, environmental conditions, and other sources. No single measurement methodology is likely to capture every relevant exposure scenario.

Question 8: Improvements to Exposure Assessment

ITI supports continued improvement of exposure assessment methodologies so that they better represent real-world conditions. In particular, research should address:

- Time variability: RF exposure can vary significantly over time depending on device use, network conditions, data transmission, and proximity.

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[4] Radiation: Electromagnetic fields**,** 4 August 2016 | Questions and answers at https://www.who.int/news-room/questions-and-answers/item/radiation-electromagnetic-fields

[5] US FDA "Cell phones" at https://www.fda.gov/radiation-emitting-products/home-business-and-entertainment-products/cell-phones

[6] See portfolio of IEEE International Committee on Electromagnetic Safety (ICES) standards at https://sagroups.ieee.org/ices/standards/

- Distance from the source: Exposure should be assessed using appropriate near-field and far-field methodologies. As noted in our answer to Question 5(a) above, FCC rules establish RF exposure limits and specify SAR and maximum permissible exposure methodologies for evaluating RF exposure.[7]
- Device power control: Consumer wireless devices do not necessarily operate continuously at maximum transmit power.
- Multiple sources: Assessments should account for multiple sources where scientifically warranted, while avoiding assumptions that all sources operate simultaneously at maximum output.
- Emerging technologies: Methods should be developed to accommodate higher frequencies, new antenna architectures, and other technologies.
- Wearables and body-worn devices: Wearables are already evaluated under established close proximity SAR standards and reflect intermittent, ultra low power operation in real world use.
  Population-level assessment: Environmental measurements and modeling should be combined where appropriate to characterize representative exposures rather than relying exclusively on theoretical maximum exposure.

Improved real-world exposure characterization would strengthen both scientific research and regulatory decision-making.

Question 9: Technical and Exposure Information for Public Disclosure

ITI supports providing consumers and other stakeholders with accurate, meaningful, and appropriately standardized information concerning RF exposure. Information requirements should, however, be scientifically justified, technically accurate, understandable, comparable across products, based on standardized measurement methodologies, and designed to communicate meaningful information about exposure rather than simply providing technical values without context.

For consumer products, relevant information could include, where appropriate, applicable exposure limits; applicable compliance methodology; SAR or other relevant exposure metrics; operating frequency ranges; and information concerning safe installation or operation where specific conditions are necessary.

ITI does not recommend product labeling or disclosure requirements that imply the existence of a health risk that has not been established by the scientific evidence. Where disclosure is required, HHS should coordinate with other federal agencies to promote consistent terminology and avoid duplicative or contradictory requirements.

Question 10: Surveillance Systems

ITI supports continued evaluation of available surveillance systems and additional data collection where it can address meaningful scientific questions.

- Disease registries: Disease registries can be valuable for identifying population-level trends but generally cannot establish RF exposure as a causal factor without reliable exposure characterization and appropriate epidemiological controls.
- Occupational monitoring: Occupational monitoring can be particularly valuable for populations with potentially elevated exposures, provided that measurements are standardized and representative.
- Environmental monitoring: Environmental monitoring can help characterize RF exposure in particular locations and identify changes over time. Measurements should be conducted using validated equipment and methodologies.

[7] IEC/IEEE 62209-1528 describes in detail the SAR measurement methodology for handheld and body-worn wireless devices: https://webstore.iec.ch/en/publication/62753

- Longitudinal cohort studies: Longitudinal studies may be valuable for evaluating long-term health outcomes, particularly where exposure can be reliably characterized over time.
- Biomonitoring: Biomonitoring should be pursued only where scientifically validated biomarkers relevant to RF exposure and health outcomes have been identified.
- Adverse-event reporting: Adverse-event systems can provide useful signals for research but should not, by themselves, be treated as evidence of causation.
- Disease or illness clusters: Reports of clusters may appropriately trigger investigation, but assessment should include rigorous exposure characterization and consideration of alternative explanations.

ITI encourages HHS to prioritize surveillance approaches that combine reliable exposure data with appropriate health-outcome data.

Question 12: Evidence Below Current Federal Exposure Limits

ITI recognizes that research continues concerning possible biological and health effects at exposure levels below current federal limits. This research should be evaluated using the same rigorous principles described above, including exposure verification, dosimetry, appropriate controls, sham exposures, reproducibility, statistical validity, biological plausibility, consistency across studies, and relevance to realistic human exposures.

A finding of a biological response does not necessarily establish an adverse health effect. HHS should also distinguish between studies conducted at exposure levels below a regulatory limit and studies that demonstrate that the existing limit is insufficiently protective. The latter requires a substantially broader evidentiary assessment, including consideration of the exposure-response relationship, consistency of findings, and the adequacy of the scientific basis underlying the existing limit.

Question 13: Technologies and Cumulative Exposure

ITI recommends that HHS evaluate technologies according to their actual RF exposure characteristics rather than by technology-generation labels. "5G," "6G," "Wi-Fi," "IoT," and other categories encompass diverse frequencies, power levels, antenna configurations, operating modes, timing, and use cases.

- **13(a) 5G:** 5G networks can use a range of frequencies and network architectures. Exposure therefore depends on factors such as frequency, transmitted power, antenna configuration, beamforming, duty cycle, network loading, time, and distance. ICNIRP's 2020 RF Guidelines expressly cover 5G technologies. HHS should therefore evaluate 5G based on measurable exposure parameters rather than treating 5G as a unique health-risk category.
- **13(b) 6G:** Because 6G technology and deployment architectures continue to evolve, HHS should avoid making assumptions about future exposure characteristics based solely on the term "6G." Research should focus on actual technologies, frequencies, exposure levels, and operating conditions as they are developed and deployed.
- **13(c) Wi-Fi:** Wi-Fi devices generally operate at relatively low transmit powers and may operate across multiple frequency bands. Exposure should be characterized over time based on actual device operation, distance, duty cycle, and relevant frequency.
- **13(e) IoT:** IoT encompasses a very broad range of technologies, including devices using Bluetooth, Wi-Fi, cellular, and other protocols. The appropriate exposure assessment therefore depends on the individual technology and operating characteristics.
- **13(f) Wearable technologies:** Wearables may be positioned close to or directly against the body, making appropriate near-field and localized exposure methodologies particularly relevant. The Centers for

Disease Control (CDC) currently describes most wearables as using low-powered RF transmitters and states that wearable devices expose users to RF levels below applicable exposure limits.[8]

- **13(g) Smart homes and appliances:** Smart-home devices should be assessed based on their individual transmission characteristics and actual use patterns.
- **Overall cumulative exposure:** ITI supports research into cumulative exposure where scientifically warranted. However, cumulative exposure should be calculated using appropriate exposure metrics and scientifically justified aggregation methods. Simply adding the nominal maximum output of multiple technologies would not necessarily provide a meaningful measure of human exposure. Additionally, ITI notes that cumulative exposure has a temporal dimension and that aggregating different sources of RF exposure should be based on reliable and accurate temporal data of different technologies. Merely assuming that all devices and technologies cause RF exposure concurrently is an overestimation of the real-world exposure.

Question 16: Federal Research Priorities

ITI recommends that federal research prioritize areas where additional evidence could materially improve health-risk assessment and regulatory decision-making. Priority areas should include:

- Real-world exposure characterization.
- Long-term epidemiological studies with reliable exposure data.
- Improved dosimetry and computational modeling.
- Higher-frequency RF exposure.
- Emerging wireless technologies and architectures.
- Simultaneous and multiple-source exposure.
- Occupational exposure.
- Reproductive and developmental outcomes.
- Reproducibility of experimental findings.
- Standardized measurement methodologies.
- Improved translation between experimental exposure conditions and human exposure scenarios.
- Environmental exposure and ecological effects where credible evidence indicates a research gap.

Federal research should emphasize rigorous study design, transparent methodologies, preregistration where appropriate, data sharing, reproducibility, and independent scientific review. Research priorities should also be periodically updated as technologies and scientific knowledge evolve.

Question 17: Federal Coordination

ITI strongly supports improved coordination among federal agencies:

- The FCC has regulated RF emissions since 1985 and adopted its comprehensive framework in 1996. For nearly 30 years, the FCC has served as the primary federal regulator of RF exposure, and it has done so effectively. The FCC's regime is grounded in science, informed by the input of federal health and safety agencies.
- FDA should continue to provide scientific and health expertise concerning radiation-emitting electronic products and medical devices and should coordinate with the FCC concerning RF exposure and device-related health questions. FDA already identifies its role in consulting with other federal agencies on

[8] CDC Radiation and Your Health "Facts about Wearable Technology" at https://www.cdc.gov/radiation-health/data-research/facts-stats/wearable-technology.html

testing and evaluation of electronic product radiation and in collecting and evaluating scientific information concerning electronic product radiation.
- NIH should support independent, peer-reviewed research addressing identified scientific gaps, particularly long-term epidemiology, dosimetry, emerging technologies, and reproducibility.
- CDC can contribute to public-health surveillance, risk communication, population-level exposure information, and interpretation of epidemiological evidence.
- Interagency coordination: ITI recommends that HHS establish or strengthen a formal interagency mechanism for coordinating RF/EMF research and risk assessment. Such coordination could identify research gaps, minimize duplication, develop common terminology, coordinate research priorities, establish common exposure-assessment methodologies, facilitate data sharing, and promote consistent public communications.

HHS should coordinate, as appropriate, with the FCC and other federal agencies outside HHS whose regulatory responsibilities intersect with RF-emitting technologies. A coordinated federal approach would help avoid situations in which different agencies communicate inconsistent interpretations of the same scientific evidence.

Question 18: Additional Scientific, Technical, or Regulatory Information

ITI recommends that HHS consider the following additional principles:

- **Maintain technology neutrality:** Regulatory frameworks should be based on exposure and scientifically demonstrated health effects rather than technology names or generations.
- **Use internationally recognized standards:** HHS should consider internationally developed exposure standards and measurement methodologies, particularly ICNIRP and IEEE/IEC standards, when evaluating the scientific and technical basis of RF exposure requirements.
- **Promote regulatory harmonization:** Where scientifically appropriate, U.S. requirements should align with internationally recognized approaches to minimize unnecessary divergence in testing, certification, labeling, and product design requirements.
- **Distinguish exposure from health risk:** Exposure measurements are necessary for risk assessment but should not be interpreted as evidence of health risk without appropriate scientific context.
- **Improve public communication:** Federal agencies should provide clear explanations distinguishing ionizing and non-ionizing radiation, biological effects and adverse health effects, hazard and risk, exposure limits and actual exposure, and scientific uncertainty versus evidence of harm.
- **Avoid unnecessary or duplicative product requirements:** Where existing federal equipment authorization and exposure requirements adequately address a particular risk, additional product-specific federal requirements should be supported by a demonstrated regulatory need and scientific evidence.
- **Preserve flexibility for emerging technologies:** Regulatory frameworks should be sufficiently technology-neutral and adaptable to accommodate future wireless technologies without requiring entirely new regulatory regimes for each generation of technology.
- **Encourage standards development:** HHS should engage with appropriate standards-development organizations to ensure that scientific advances are translated into practical, consensus-based measurement and assessment methodologies.

III. CONCLUSION

ITI appreciates HHS's effort to gather scientific, technical, and stakeholder information concerning RF/EMF exposure and human health. The technology industry recognizes the importance of protecting public health and supports continued rigorous scientific research concerning RF/EMF exposure. At the same time, regulatory decisions should be grounded in the totality of reliable scientific evidence, appropriately characterized human exposure, validated dosimetric methodologies, and internationally recognized risk-assessment principles.

Existing frameworks, including the FCC's RF exposure requirements, ICNIRP's 2020 RF Guidelines, and IEEE standards, provide important scientific and technical foundations for this work. ICNIRP's guidelines specifically address RF exposure from 100 kHz to 300 GHz and encompass technologies including 5G, Wi-Fi, Bluetooth, mobile phones, and base stations. IEEE C95.1-2019 similarly establishes exposure limits across 0 Hz to 300 GHz.[9] ITI encourages HHS to focus future research on meaningful gaps in exposure characterization, long-term health outcomes, emerging technologies, multiple-source exposure, higher-frequency RF, occupational exposure, and improved dosimetry.

Finally, ITI encourages HHS to coordinate closely with FDA, NIH, CDC, FCC, and other relevant agencies and to promote international regulatory harmonization wherever scientifically appropriate. A coordinated, science-based, technology-neutral framework will help ensure that public-health protections remain effective while supporting continued innovation and deployment of wireless and connected technologies.

ITI appreciates the opportunity to provide these comments and looks forward to continued engagement with HHS and other federal agencies on these important issues.

[9] IEEE C95.1-2019 IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz at https://standards.ieee.org/ieee/C95.1/4940/