



ITU-T Study Group 5

Environment, climate action, circular economy and electromagnetic fields

Updates from ITU-T SG5

2026



International Telecommunication Union (ITU)



The International Telecommunication Union (ITU) is the United Nations specialized agency for information and communication technologies (ICTs)



194 Member States

+700 Companies/organizations

+160 Academia members



ITU Resolutions on Environment, EMF, Climate Change and Circular Economy



ITU Resolution 182 – “Role of telecommunications/information and communication technologies in regard to climate change and the protection of the environment”

ITU Resolution 176 – “Measurement and assessment concerns related to human exposure to electromagnetic fields”

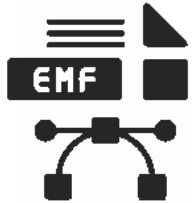


ITU-T Resolution 79 – “Role of telecommunications/information and communication technologies in handling and controlling e-waste from telecommunication and information technology equipment and methods of treating it”

ITU-T Resolution 72 – “Measurement and assessment concerns related to human exposure to electromagnetic fields”

ITU-T Resolution 73 – “Information and communication technologies, environment, climate change and circular economy”

Resolution 72 on “Measurement and assessment concerns related to human exposure to electromagnetic fields” (Rev. New Delhi, 2024)



Urgent need on
standardized
measurements on human
exposure to EMF



AI and other emerging
technologies as a facilitator
on EMF modeling and
assessment



Key highlights

Considering:

- that the considerable increase in the use of telecommunications/ICT equipment has resulted in an increase in the sources of EMF emission, including simultaneous exposure from multiple sources, with a potential impact on exposure levels;
- that there is a need to inform the public of the levels of EMF from different radio-frequency (RF) sources in a scientific and objective manner through measurements and other standardized methodologies, as well as of the potential effects of EMF exposure;
- that AI and other emerging technologies can facilitate modelling and assessment of human exposure to EMF.

Resolves:

- to develop, publish and disseminate technical reports and Recommendations to **support countries in formulating guidelines regarding EMF exposure**;
- to encourage **collaboration with SDOs in field of simplifying the testing process for measuring and assessing exposure to EMF to make it more accessible and cost-effective for developing countries.**



How ITU supports Environment, EMF and Circular Economy

ITU-T Study Group 5 lead roles: EMF, environment, climate action, sustainable digitalization and circular economy, develops standards on:

- Electromagnetic compatibility (EMC), resistibility and lightning protection
- Soft error caused by particle radiations
- Human exposure to electromagnetic fields (EMF)
- Circular economy and e-waste management
- ICTs related to the environment, energy efficiency, clean energy and sustainable digitalization for climate actions



SG5 Structure (Study Period 2025-2028)

PLEN



8/5

Guidance and
terminology on
environment

WP1/5



1/5

Electrical
protection,
reliability, safety,
and security of
telecommunication/
ICT systems



2/5

Equipment
specification and
component/device for
protection against
lightning and other
phenomena



3/5

Assessment of
human exposure to
electromagnetic
fields (EMFs)



4/5

Electromagnetic
compatibility (EMC)
aspects in
telecommunications
/ICTs



6/5

Environmental
efficiency of
telecommunica
tions/ICTs



7/5

E-waste, circular
economy, and
sustainable supply
chain management



9/5

Assessing the impact
of telecommunications
/ICTs on climate
change, biodiversity
and the environment -
including the influence
on other sectors



11/5

Climate change
mitigation and smart
energy solutions



12/5

Climate actions and
adaptation to climate
change through
sustainable and
resilient
telecommunications/I
CTs (including new
and emerging)

WP2/5

WP3/5



Study Group 5 Key Topics

EMC, lightning protection, EMF



Classification of the K.series Recommendation

Key Recommendations

ITU-T K.91, “Guidance for assessment, evaluation and monitoring of human exposure to radio frequency electromagnetic fields”

ITU-T K.83, “Monitoring of electromagnetic field levels”

ITU-T K.145, “Assessment and management of compliance with RF EMF exposure limits for workers at radiocommunication sites and facilities”

ITU-T K.160, “Assessment of human exposure to radiofrequency electromagnetic fields from wireless communication devices operating close to the human body”

ITU-T K.Suppl.1 to K.91, “Guide on electromagnetic fields and health”

ITU-T K.Suppl.32, “Case studies of radio frequency- electromagnetic field (RF-EMF) assessment”

Updates on the EMF Guide to include 5G references and updates on WHO and other guidelines.

Under Study

Revision of:

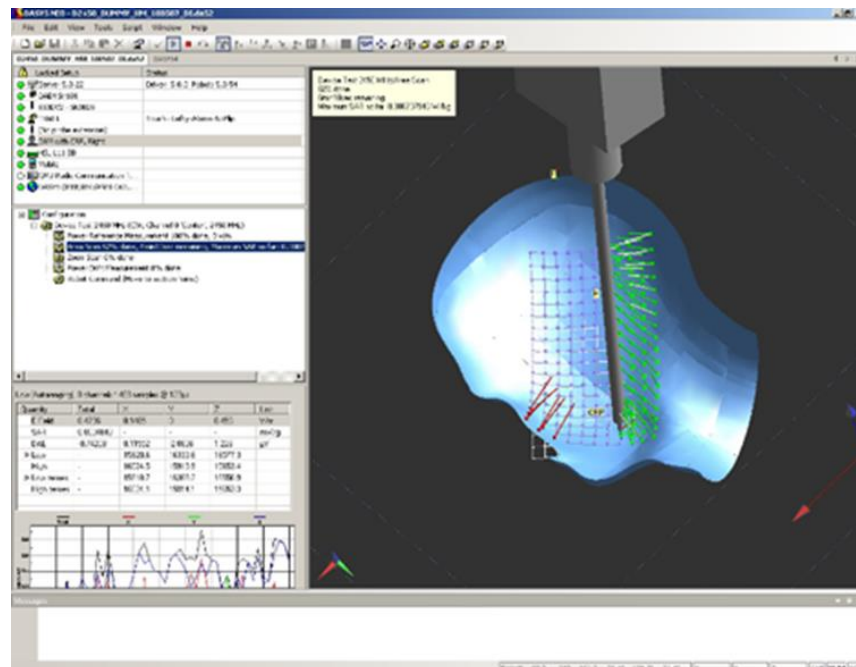
- **K.70**: Mitigation techniques to limit human exposure to EMFs in the vicinity of radiocommunication stations
- **K.83_Revision**: Monitoring of electromagnetic field levels
- **K.91**: Guidance for assessment, evaluation and monitoring of human exposure to radio frequency electromagnetic fields
- **K.Sup.14**: The impact of antenna siting restrictions in the form of RF-EMF exposure limits stricter than the ICNIRP or IEEE guidelines and planning exclusion rules on mobile network deployment
- **K.Sup.32**: Case studies of radio frequency-electromagnetic field (RF-EMF) assessment

New work under study

- **K.calibr**: Calibration for equipment for the EMF assessment
- **K.actual_max**: Guidance on implementation of Actual Maximum Approach for assessment, evaluation, compliance and monitoring of RF EMF
- **K.Sup.Reflection**: Impact of the metallic structures for the EMF exposure level
- **K.Suppl.MethDataEMF**: Guidance on Methodologies for RF-EMF Assessments and Responding to Public Concerns regarding human exposure to RF-EMF from Telecommunication Installations
- **KSTR-AIEMF**: RF-EMF evaluation method using AI (artificial intelligence) in the vicinity of IMT-2020 (5G) NR BS
- **KSTR-SafetyZones**: Impact of public safety zones and compliance distances on telecommunication network development and deployment

Recommendation ITU-T K.160: RF EMF exposure assessment of the wireless radiocommunication devices operating close to the human body.

This Recommendation gives guidance on the means to assess and monitor human exposure to radiofrequency (RF) electromagnetic fields (EMFs) from wireless communication devices operating in proximity to the human body.



Recommendation ITU-T K.160 (12/2025)

SERIES K: Protection against interference

Assessment of human exposure to
radiofrequency electromagnetic fields from
wireless communication devices operating
close to the human body



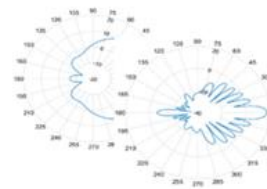
Technical report ITU-T KSTR-AIEMF: RF-EMF evaluation method using AI (artificial intelligence) in the vicinity of IMT-2020 (5G) NR BS

Some 5G NR BS use beam-forming technology, which has advantages of increasing data transmission-speed and sending more data using wide bandwidths. It also implies an increased complexity in assessing RF-EMF exposure in the vicinity of the Base Station.

This Technical Report will document initial findings and data requirements for an RF-EMF evaluation method to be applied to 5G NR BS using AI.



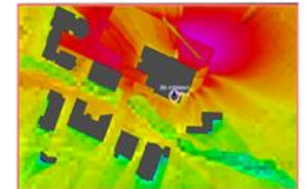
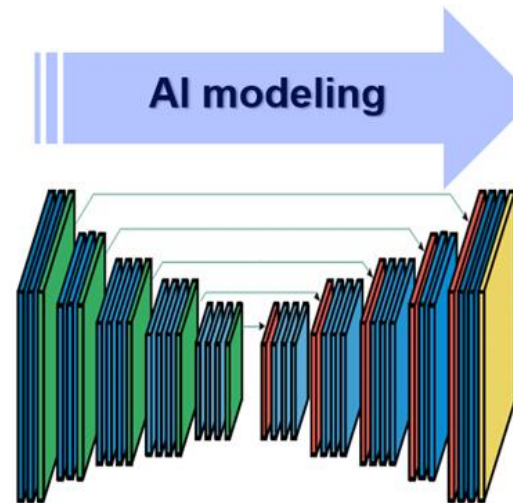
GIS data



Antenna radiation pattern

Longitude	Latitude
Altitude	PCI
Distance	

Numeric data

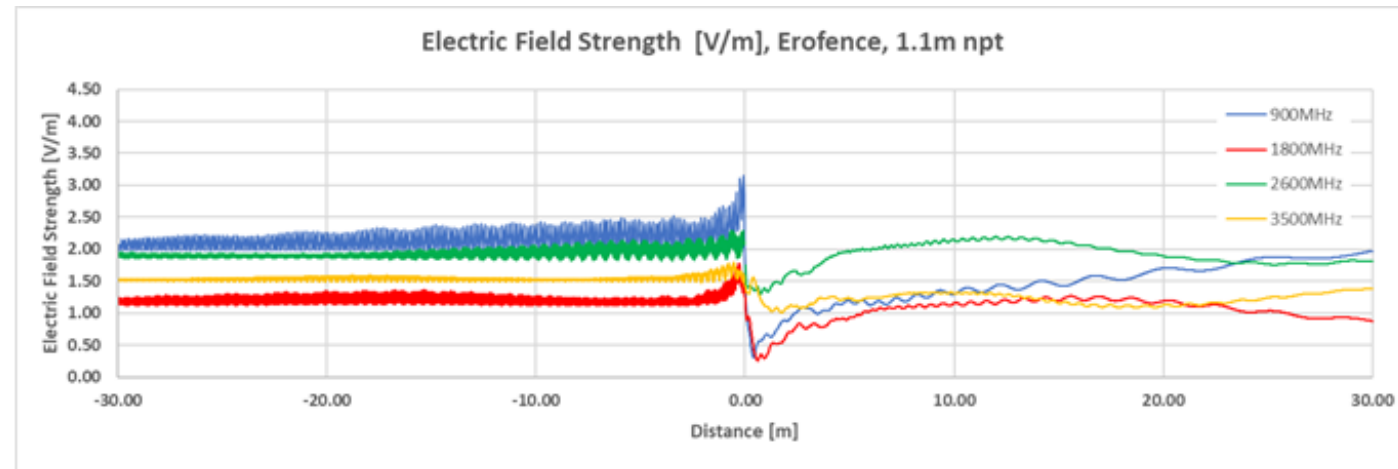
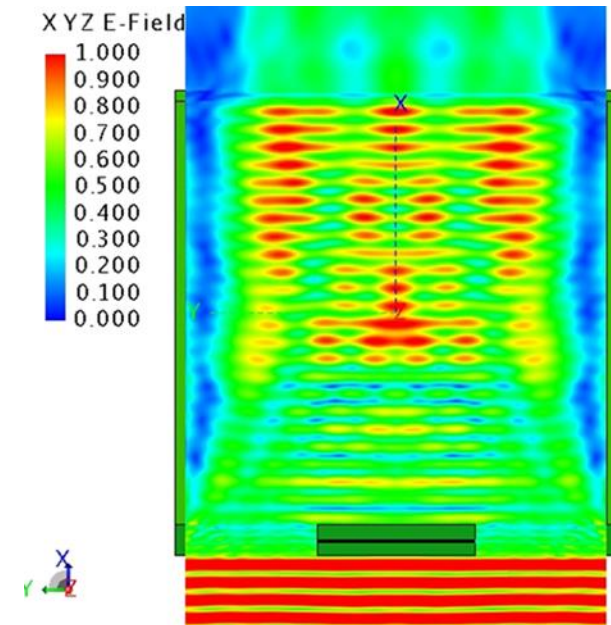


Field strength

Supplement ITU-T K.Sup.Reflection: Impact of the metallic structures for the EMF exposure level

The strength of electromagnetic fields in free space and within the vicinity of metallic objects are different. Calculations on the EMF exposure levels is commonly done under free space conditions. However, it has been suggested that metallic objects and structures may have substantial influence on the results of the measurement of the EMF exposure level. Such influence may alter regulations concerning assessment of the human exposure to RF EMF.

This Supplement will provide a guidance on evaluating the impact of the metallic structures on the assessment of human exposure to EMF.



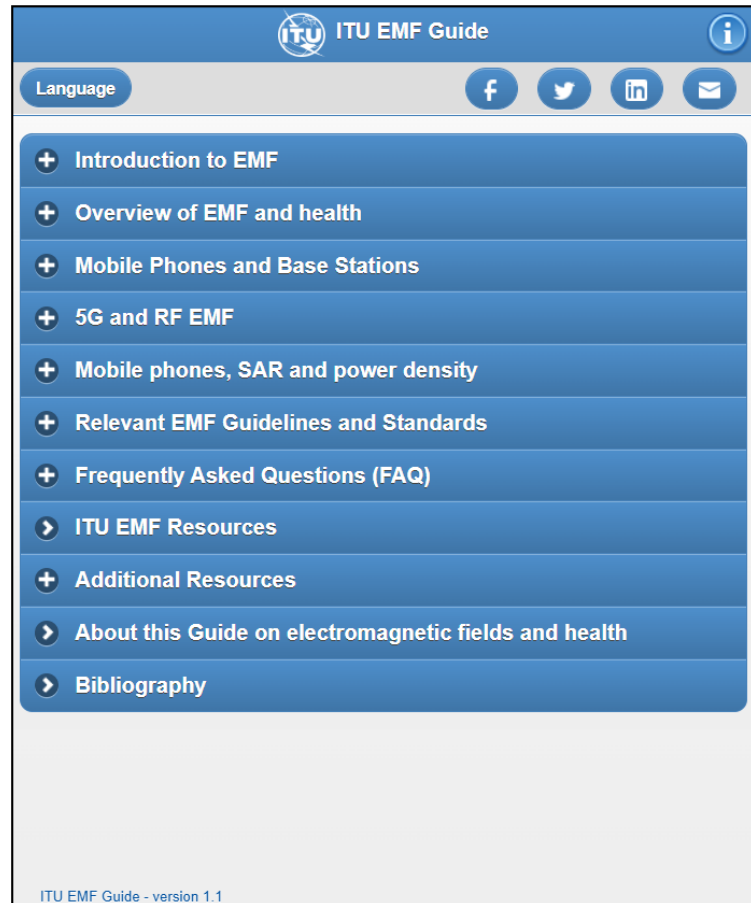
Supplement ITU-T K.Suppl. MethDataEMF: Guidance on Methodologies for RF-EMF Assessments and Responding to Public Concerns regarding human exposure to RF-EMF from Telecommunication Installations.

- ❑ It will provide comprehensive guidance to ITU Member States seeking to conduct RF-EMF assessments with the use of ITU-T Recommendations or Supplements and other international technical standards (e.g., IEC).
- ❑ Development of a framework for harmonized RF-EMF assessment methodologies to EMF measurement and assessments of telecommunication installations (such as cellular and broadcasting).
- ❑ Propose development of a format for data collection and sharing the results of RF-EMF assessments to allow comparability between countries and analysis.
- ❑ Furthermore, it will develop guidance on addressing public concerns and misconceptions related to RF-EMF exposure from telecom installations.

ARE EMFs



A CONCERN?



The EMF Guide provides up-to-date information and education resources on Electromagnetic Fields suitable for all communities and governments stakeholders



ITU-T Recommendations in force

ITU-T Rec. Number	Title	Year
K.52	Guidance on complying with limits for human exposure to electromagnetic fields	2021
K.61	Guidance to measurement and numerical prediction of electromagnetic fields for compliance with human exposure limits for telecommunication installation	2025
K.70	Mitigation techniques to limit human exposure to EMF's within vicinity of radiocommunication stations	2020
K.83	Monitoring of the electromagnetic field levels	2024
K.90	Evaluation techniques and working procedures for compliance with exposure limits of network operator personnel to power-frequency electromagnetic fields	2018
K.91	Guidance for assessment, evaluation and monitoring of the human exposure to radio frequency electromagnetic fields	2024
K.100	Measurement of human exposure levels when a wireless installation is put into service	2024
K.113	Generation of radiofrequency electromagnetic fields (RF-EMF) level maps	2025
K.121	Guidance on the Environmental Management for Electromagnetic Radiation from Radiocommunication Base Stations	2016
K.122	Exposure levels in the close proximity of the radiocommunication antennas	2016
K.145	Assessment and management of compliance with RF EMF exposure limits for workers at radiocommunication sites and facilities	2020
K.153	Guidance on determining the compliance boundaries (exclusion zones) of radio transmitter installations	2023
K.156	Time and spatial averaging in RF-EMF exposure assessment	2024
K.160	Assessment of human exposure to radiofrequency electromagnetic fields from wireless communication devices operating close to the human body	2025

ITU-T Supplements in force

Work item	Title	Year
K Suppl. 1 to K.91	Guide on electromagnetic fields and health	2021
K. Suppl. 4 to K.91	Electromagnetic field considerations in smart sustainable cities	2018
K Suppl. 9	5G technology and human exposure to RF EMF	2019
K Suppl. 13	Radiofrequency electromagnetic field (RF-EMF) exposure levels from mobile and portable devices during different conditions of use	2021
K Suppl. 14	The impact of RF-EMF exposure limits stricter than the ICNIRP or IEEE guidelines on 4G and 5G mobile network deployment	2019
K Suppl. 16	Electromagnetic field (EMF) compliance assessments for 5G wireless networks.	2022
K Suppl. 19	Electromagnetic field (EMF) strength inside underground railway trains	2019
K Suppl. 20	RF Exposure evaluation around base station installed underground	2021
K Suppl. 29	EMF strength inside and outside of electric vehicle using wireless power transfer (WPT) technology	2022
K Suppl. 32	Case studies of radio frequency- electromagnetic field (RF-EMF) assessment	2024

ITU-T documents under development

ITU-T Rec. Number	Title	Year
K.Actual Max	Guidance on implementation of Actual Maximum Approach for assessment, evaluation, compliance and monitoring of RF EMF	2027
K.Sup.Reflection (ex K.reflection)	Impact of the metallic structures for the EMF exposure level	2026
K.AI&EMF	EMF evaluation method using artificial intelligence in vicinity of 5G NR (IMT-2020) base station	2026
K.Suppl. MethDataEMF	Guidance on Methodologies for RF-EMF Assessments and Responding to Public Concerns regarding human exposure to RF-EMF from Telecommunication Installations	2027
K.calibr	Calibration for equipment for the EMF assessment	2027
KSTR-AIEMF	RF-EMF evaluation method using AI (artificial intelligence) in the vicinity of IMT-2020 (5G) NR BS	2026
KSTR-SafetyZones	Impact of public safety zones and compliance distances on telecommunication network development and deployment	2027

Thank you!



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action & circular economy](#)

