Saudi Arabia National Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields

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PUBLIC AWARENESS OF HEALTH & SAFETY FROM MOBILE PHONES AND TELECOMMUNICATION TOWERS

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About CITC

- Established in 2001
- National regulatory authority for the Communications and Information Technology sector in the Kingdom of Saudi Arabia (KSA)
- Management and regulation of radiofrequency (RF) electromagnetic fields (EMF) in accordance with its Statutes
Regulations Related to Mobile Base Stations

- Technical and Municipal Rules for Licensing to Install Commercial Radio Equipment
- Industrial Property Authority Rules
- Technical Specs for Telecom and IT Equipment
- National Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields
Safety Specifications for ICT Equipment (1/2)

- CITC issued General Requirements spec for ICT Equipment (GEN001)
- This specification approved 11/03/2006
- Updated this spec 10/01/2010
- Defines the minimum requirements which must be met by all:
  - Telecommunications Terminal Equipment
Safety Specifications for ICT Equipment (2/2)

- Radio Equipment
- Network Equipment
- IT Equipment

- Includes RF exposure limits standards specification
Preliminary Guidelines for Limiting Exposure to Wireless Base Stations (1/2)

- Published and required all communications service providers to follow Guidelines for Limiting Exposure of Wireless Base Stations, dated 20/02/2007, to ensure compliance of radiation from wireless base stations, including:
  - Conducting measurements at wireless base stations at peak hours
  - Establishing appropriate access restrictions
Preliminary Guidelines for Limiting Exposure to Wireless Base Stations (2/2)

– Reducing the transmitter RF power emitted from the antennas when RF levels exceed ICNIRP limits
National Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields

**Project start**
18/12/2006

**Inception Report**
Detailed work plan including the activities necessary to achieve the project objectives and deliverables

**Initial Review Report**
Review of the projects and studies of key independent international commissions and organizations
National Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields

- Preliminary National Guidelines
- Public Consultation Document
- Analysis of Public Comments
- Final Version of the National Guidelines
National Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields

Besides the principal task of developing the National Guidelines, there were other tasks under the scope as follows:

- Document on-site measurement methods
- Document CITC procedures for assessing site compliance with the National Guidelines
- Test assessment trials
- Recommendations for CITC participation in EMF activities at the international level and for knowledge management
WHO Recommendations to National Authorities on RF

- Adopt international standards (ICNIRP)
- Establish EMF programs to ensure compliance with standards and approve safety of new large installations
- Establish a public information program
- Monitor the WHO International EMF Project website for information on EMF, upcoming meetings, new reports, fact sheets, etc.

These recommendations have formed the basis for the CITC National Guidelines on RF Safety
Legal Status of the National Guidelines

- The Telecommunications Act (2001) provides the legislative basis for developing and regulating the telecommunications and broadcast sectors.

- The Telecommunications Bylaw (2002) provides for the regulation of the telecom sector by CITC in the Kingdom of Saudi Arabia. The National Guidelines provide the regulations under this Bylaw.
National Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields

- CITC approved the National Guidelines (NG) for Human Exposure to Radiofrequency Electromagnetic Fields in Dec 2009
- The NG Replaces the 2007 Guidelines for Limiting Exposure of Wireless Base Stations and are effective from Jan 2010
- Period of two years to regularize the status of fixed RF sources existing before issuance of the National Guidelines
- Compliance documentation submitted for at least 12.5% of fixed RF sources every three months until all fixed sources have been verified as compliant with updated requirements
National Guidelines

**Purpose:** Establish technical regulatory practices for limiting human exposure to radiofrequency (RF) fields to protect against adverse health effects from installations or devices emitting RF fields

**Scope:** Establish minimum requirements for the protection of the public and workers from health risks arising or likely to arise from their exposure to RF in the range 3 kHz to 300 GHz
National Guidelines Application

Applies to RF exposures from fixed RF sources and installations that fall within the scope of the Telecom Act and Bylaw, including radio telecommunications and broadcast technologies

Does not apply to patients in medical care, military uses, radars, computer monitors, microwave ovens, industrial uses
Technical Basis of the National Guidelines

- Exposure limits are the same as the International Commission on Non-Ionizing Radiation Protection (ICNIRP, 1998), adopted by over 40 countries.

- Measurement procedures require the use of the international standards issued by the International Telecommunication Union (ITU), International Electrotechnical Commission (IEC), and the Institute of Electrical and Electronics Engineers (IEEE).

- Compliance procedures follow current best engineering and administrative practices.

- Requirements in the National Guidelines are similar to the standards in most countries that have adopted international best practices.
Exposure Limits

- The National Guidelines protect against established adverse health effects of RF by prescribing safe limits on human RF exposure.
- The exposure limits of the National Guidelines are consistent with the ICNIRP limits.
Public and Occupational Limits

- The public limits apply to:
  a) RF exposure of all children less than 16 years old
  b) RF exposure of all other persons, except RF workers
  c) All mobile or portable radio devices that are certified not to exceed the public limit

- The occupational limits apply to designated trained RF workers who have been formally identified and trained to work in areas where exposures above the public limits could occur
Simultaneous Exposure to Multiple RF Fields

- Formulas to evaluate exposure to multiple simultaneous RF fields are given in the National Guidelines.

- Basic restrictions and reference levels must be measured separately for electro-stimulatory and thermal effects on the body.
Compliance with National Guidelines

Mobile or Portable Radio Devices:

- Manufacturer and/or importer is responsible for compliance assessment of device
- Must comply with public limits of the National Guidelines
- Declaration of conformity to be issued for each type of device

Fixed RF Sources:

- Radio Licensee
  Radio licensees shall be liable to CITC for ensuring and demonstrating compliance
- Property Owners
  Property owners shall comply with requests from CITC and/or radio licensees for verifying or maintaining compliance on their property
Compliance Assessment Standards

The compliance assessment of a fixed RF source shall be conducted according to the test methods described in:

- Annex 6 of the National Guidelines, or
- IEEE Std C95.3, Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100kHz – 300GHz
Site Assessments

Sites should be assessed to ensure compliance with the Guidelines

- Assessment and identification of exclusion zones (red and yellow zones)
- Ensure members of the public are not exposed to fields above public limits
- Ensure trained RF workers are not exposed to fields above occupational limits
Site Compliance

For fixed sites to meet compliance, there should be:

- RF safety documentation that identifies RF exclusion zones
- Access restrictions and site controls in place (fencing, locked doors, etc.)
- RF warning signage on site
- Submission of compliance documentation to CITC
Quality Control

A laboratory conducting compliance assessments for mobile or portable radio devices should be accredited by its national accrediting agency to:

- ISO/IEC 17025:2005 standard, General requirements for the competence of testing and calibration laboratories, or
National Guidelines Annexes

Annexes provide material that will help in interpretation of the National Guidelines, e.g.:

- Development of an RF safety program
- Recommended RF safety signage
- Recommended key learning outcomes for comprehensive RF safety awareness training
- Written RF safety information provided with a mobile or portable radio device
- Technical guidelines and safe vertical and horizontal distances for the installation of base station antennas
RF Safety Signs

- RF safety signs indicate the nature and degree of RF hazard associated with a given fixed RF source or compliance site.
- The nature of the RF hazard is indicated by a symbol, and the degree of the hazard is indicated by a sign bearing words to that effect.

![RF Safety Signs](image-url)
Field Measurements of Electromagnetic Radiation

Technical Cooperation with Academic and Research Organizations

So far the results of all field measurements of RF radiation levels from base stations are much lower than allowable limits in the National Guidelines.
Samples of Audited Sites
Measurements are Made in Different Directions
Measurements are Made at Several Points in the Direction of Max Power
Measurements are Made Inside Buildings if Necessary
Antenna Heights for 113 Audited Base Stations
Number of Measurements Versus Measured Power Density Level Ranges
Power Density Distribution for Wide Band Measurements
Number of Sites Versus Measured Power Density Level Ranges

Power Density for Selective Measurement (mW/m²)

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<th>No. of Sites</th>
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<td>$100 &lt; x$</td>
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- **GSM900**
- **GSM1800**
- **UMTS**
- **Total (All bands)**

25th May 2011
Power Density Distribution for Wide Band Measurements

Wideband Measurement (mW/m²)

![Graph showing power density distribution]

- x < 0.001
- 0.001 < x < 0.01
- 0.01 < X < 0.1
- 0.1 < X < 1
- 1 < X < 10
- 10 < X < 100

No. of Sites

Wideband using Probe EF1891
Public Information Program

CITC seeks to raise public awareness about electromagnetic radiation health effects through:

- Brochures and advertisements through its website and the media
- Workshops
- Participation in local and international ICT exhibitions
- Community meetings
- Response to questions and complaints from the public
- Monitoring and responding to misleading info in the media
والسلام عليكم ورحمة الله وبركاته

Thank You!

Communications and Information Technology Commission

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