


China Mobile Communication Base Station Electromagnetic Radiation Management Policies and Standards

Mr. Guo-qing LI

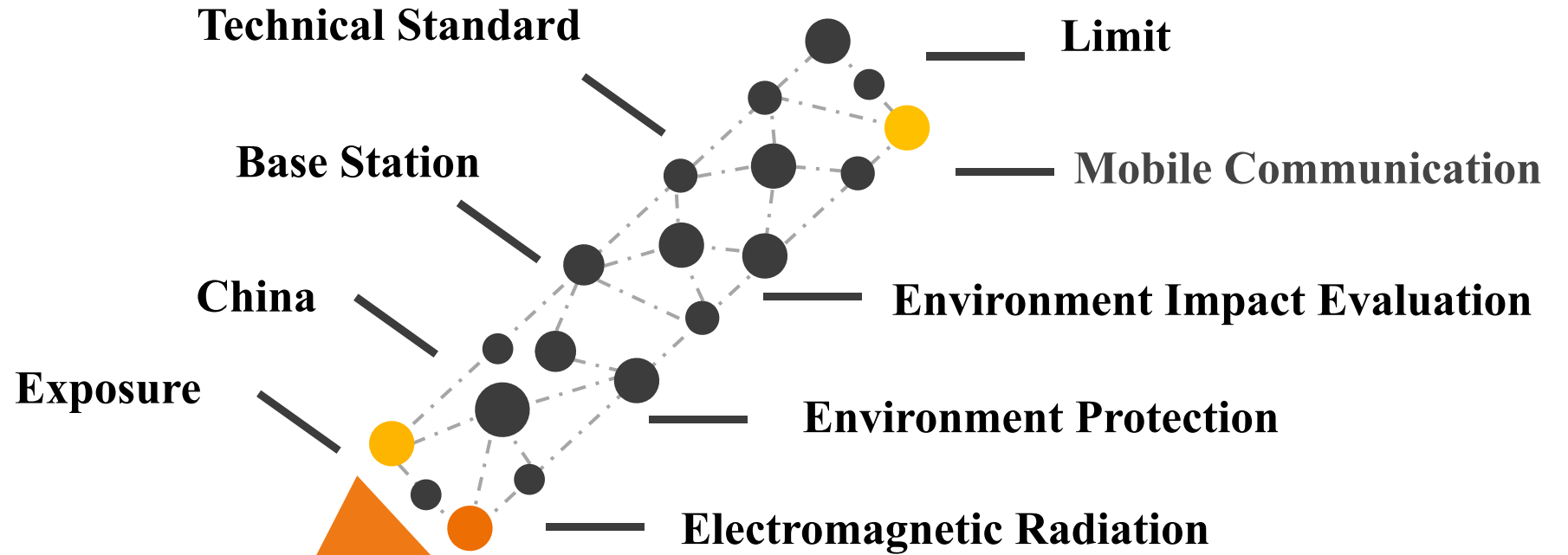
Professor Senior Engineer

China Academy of Information and Communication Technology (CAICT)

www.cqcatr.com



This presentation describes the current national policies and technical requirements related to electromagnetic radiation management of mobile communication base stations in China, including laws and regulations on electromagnetic radiation management, electromagnetic environmental impact assessment system for mobile communication base stations, and technical standards.



01 Laws and Regulations

02 Regulations of the State Administrative Department

03 Technical Standards

A

Environmental Protection Law of China

The new version of the Environmental Protection Law of China (hereinafter referred to the "Environmental Protection Law"), which was implemented on **January 1, 2015**, is the **important law** for the management of electromagnetic radiation in China;

- ◆ The Environmental Protection Law regulates that construction of projects that have an impact on the environment should be subject to environmental impact assessment in accordance with the law, otherwise construction cannot be started; Companies that discharging pollutants shall take measures to prevent and control environmental pollution and hazards, including electromagnetic radiation, generated in production, construction, or other activities.
- ◆ Citizens, companies, and other organizations have the right to obtain environmental information, participation, and supervise environmental protection according to law;
- ◆ If a construction corporation fails to submit the environmental impact assessment documents of a construction project according to law or starts construction without approval, the environmental protection supervision and management department shall order it to stop construction, impose a fine, and may also order it to restore its original state.

B Environmental Impact Assessment Law of China

- ◆ The Environmental Impact Assessment Law of China (hereinafter referred to as the "Environmental Impact Assessment Law") was revised and implemented on December 29, 2018;
- ◆ The term "environmental impact assessment" as used in the Environmental Impact Assessment Law refers to a method and system for analyzing, predicting, and evaluating the environmental impacts that may occur after the implementation of planning and construction projects, proposing countermeasures and measures to prevent or mitigate adverse environmental impacts, and conducting follow-up monitoring;
- ◆ Environmental impact assessment is divided into planning environmental impact assessment and construction project environmental impact assessment.

B Environmental Impact Assessment Law of China

- ◆ According to the Environmental Impact Assessment Law of China, the state implements classified management for the environmental impact assessment of construction projects based on their impact extent on the environment;
- ◆ The construction corporation shall, in accordance with the following provisions, organize the preparation of an environmental impact statement book, environmental impact statement form, or fill in and submit an environmental impact registration form (collectively referred to as the environmental impact assessment document):

01 Where significant environmental impacts may be caused, an environmental impact statement book shall be prepared to comprehensively evaluate the environmental impacts generated;

02 If it may cause slight environmental impact, an environmental impact statement form shall be prepared to analyze or specially evaluate the environmental impact generated;

03 If the environmental impact is small and there is no need to conduct an environmental impact assessment, an environmental impact registration form should be filled in and submitted.

B Environmental Impact Assessment Law of China

- ◆ The classified management directory for environmental impact assessment of construction projects shall be formulated and published by the competent ecology and environment department of the State Council, i.e., Ministry of Ecology and Environment of China (abbreviation as MEE);
- ◆ The content and format of the environmental impact statement form and the environmental impact registration form shall be formulated by the MEE of China. The state implements filing management for environmental impact registration forms.
- ◆ The "Environmental Impact Assessment Law" also regulates that the construction corporation shall not commence construction if the environmental impact assessment documents of a construction project have not been reviewed by the approval department according to law or have not been approved after review;

B Environmental Impact Assessment Law of China

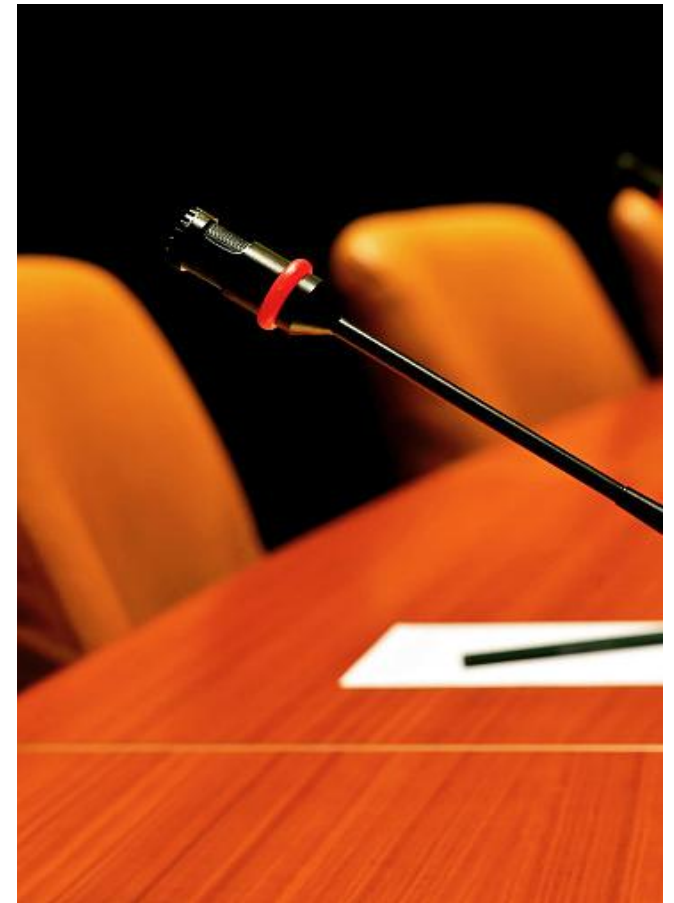
In the event of non-compliance with the approved environmental impact assessment documents during project construction and operation

- ◆ the construction corporation shall organize a post assessment of the environmental impact, take improvement measures, and report to the original environmental impact assessment document approval department and the construction project approval department for filing.
- ◆ The original environmental impact assessment document approval department may also instruct the construction corporation to conduct a post assessment of the environmental impact and take improvement measures;
- ◆ The competent ecology and environment department shall track and inspect the environmental impact of a construction project after it is put into production or use. If serious environmental pollution or ecological damage is caused, it shall identify the causes and responsibilities;
- ◆ If the construction corporation fails to file the environmental impact registration form for the construction project according to law, the competent ecology and environment department at or above the county level shall order the filing and impose a fine.

(1) Decree No. 39 of the State Environmental Protection Administration 2007 on 《Environmental Monitoring Management Measures》



- ◆ The "Environmental Monitoring Management Measures", which came into effect on **September 1, 2007**, mainly regulates the general management system for environmental protection departments to carry out **environmental monitoring activities** such as environmental quality monitoring and pollution source monitoring.

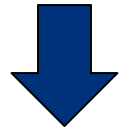


(2) Regulations on Radio Administration of China

The Radio Administration Regulations of China had been revised and implemented in December 2016

- Article 35 of the Regulations stipulates that "for the establishment of large-scale wireless radio stations (stations) and ground public mobile communication base stations, their station layout planning shall comply with the requirements of resource sharing and electromagnetic environmental protection".
- while article 40 of the Regulations stipulates that "units or individuals using radio stations shall obey the national environmental protection regulations and take necessary measures to prevent electromagnetic radiation pollution caused by radio wave emissions.

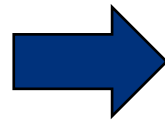
(3) Environmental Protection Memorandum for Communication Base Stations (Environmental Protection Office radiation document [2017] No. 1990)



- The Environmental Protection Office radiation document "Memorandum" had been jointly signed by the formerly **Ministry of Ecological Protection (Now MEE)**, the **Ministry of Industry and Information Technology (MIIT)**, and **four telecommunication operators (China Telecom, China Unicom, China Mobile, and China Broadcast Network)** on **October 26, 2017**, stipulating that the construction of communication base stations in China should be carried out in accordance with the "Memorandum".

Environmental Protection Memorandum for Communication Base Stations (Environmental Protection Office radiation document [2017] No. 1990)

According to the Memorandum, the environmental impact assessment of the construction of mobile communication base stations should be conducted in the form of an environmental impact registration form, in accordance with GB8702-2014.



As soon as possible after putting into operation, monitoring should be carried out by themselves or entrusted organizations which have certified by **China Inspection Body and Laboratory Mandatory Approval (CMA)** according to law in accordance with the "HJ 1151-2020 Mobile Communication Base Station Electromagnetic Radiation Environmental Monitoring Method (Trial)".

Environmental Protection Memorandum for Communication Base Stations (Environmental Protection Office radiation document [2017] No. 1990)

- The Memorandum also reached consensus on information disclosure, popular science promotion, complaints, and cooperation mechanisms.
- The four telecommunication operators must compile internal management documents based on the actual situation of the company and the Memorandum to further implement the electromagnetic radiation environmental monitoring measures for communication base stations.
- The China Tower company is required to build a base station electromagnetic radiation environmental monitoring information disclosure platform.

- statement form --> registration form
- Equivalent radiation power<100W: exempting from management
- operators' main responsibility
- Conduct self-assessment

put on record

- buildings within 50 meters for living, working, and studying
- self assessment or entrusted assessment by a qualified company
- management for monitoring companies

monitoring

- the BS sites of China Tower Company is uniformly disclosed
- disclosure content and time limit
- open channels

Information disclosure

Popular science propaganda

complaints

04 Classified Management Directory for Environmental Impact Assessment of Construction Projects

- The new version of the "Classified Management Directory for Environmental Impact Assessment of Construction Projects (2021 Edition)" came into effect on **January 1, 2021**.

This management directory adjusts the classification of environmental impact assessments of communication base stations into environmental impact registration forms, and implements record management in accordance with the "Management Measures for the Filing of Environmental Impact Registration Forms of Construction Projects".



05

Administrative Measures for the Filing of Environmental Impact Registration Forms for Construction Projects

The "Filing Management Measures" came into effect on **January 1, 2017**, stipulating that the environmental impact registration form of construction projects should be filed **online**, and the Ministry of Ecology and Environment (MEE) should uniformly establish an online filing system for the environmental impact registration form of construction projects;

Before the construction project is completed and put into production and operation, the construction corporation should log into the online filing system, register real information in the online filing system, fill in and submit the environmental impact registration form of the construction project online;

After the construction corporation submits the environmental impact registration form online, the online filing system automatically generates a filing number and receipt. The filing of the environmental impact registration form for the construction project is complete.

05

Administrative Measures for the Filing of Environmental Impact Registration Forms for Construction Projects

The construction corporation can print and retain the completed environmental impact registration form for the construction project and the filing receipt of the environmental impact registration form for the construction project.

The filing receipt of the environmental impact registration form of a construction project is a proof that the competent environmental protection department has confirmed the receipt of the environmental impact registration form of the construction corporation;

After the completion of the filing of the environmental impact registration form for the construction project, the county environmental protection department shall synchronously disclose the filing information to the public through the online filing system on its website and accept public supervision.

The competent environmental protection department or other departments responsible for environmental protection supervision and management may conduct supervision and inspection on the compliance of the construction corporation with the provisions of these Measures by means of spot checks, inspections based on reports, etc.

A template of the environmental impact registration form for the construction project is provided.

A National Standards

◆ GB8702-2014 Controlling limits for electromagnetic environment

GB8702 specifies the control limits for the electromagnetic environment, and the limits for public exposure to the mobile communication frequency band are shown below:

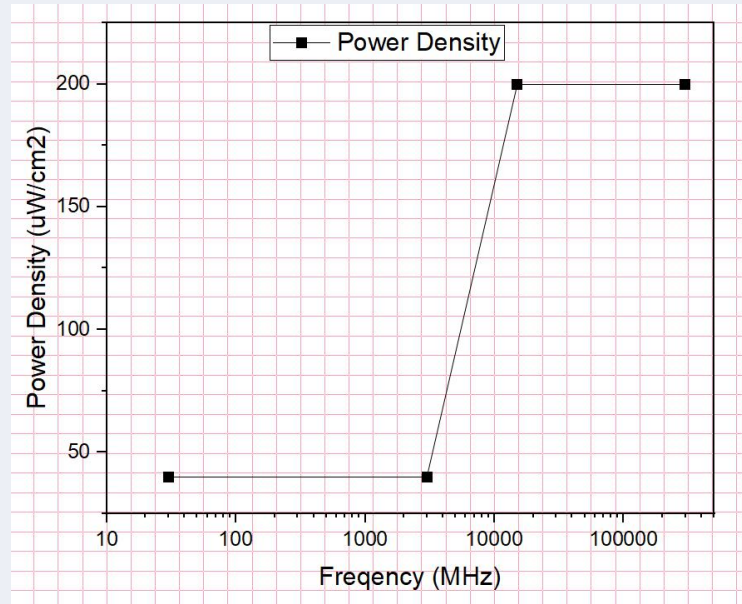
Frequency Range	Electric Intensity E (V/m)	Magnetic Filed Intensity H (A/m)	Magnetic Induction B (μ T)	Plane Ware Equivalent Power Density S_{eq} (W/m^2)
30MHz~3000MHz	12	0.032	0.04	0.4
3000MHz~15000MHz	$0.22 f^{1/2}$	$0.00059 f^{1/2}$	$0.00074 f^{1/2}$	$f/7500$
15GHz~300GHz	27	0.073	0.092	2

Public exposure limits for electromagnetic radiation from China's Mobile Communications

The plane wave equivalent power density limit for the 900 MHz/1800 MHz mobile communication frequency band is $40 \mu W/cm^2$

A National Standards

◆ GB8702-2014 Controlling limits for electromagnetic environment



Public Exposure Limits for Electromagnetic Radiation from China's Mobile Communications

A National Standards

◆ GB8702-2014 Controlling limits for electromagnetic environment

Countries and organizations	900MHz mobile telecommunication ($\mu\text{W}/\text{cm}^2$)	1800MHz mobile telecommunication ($\mu\text{W}/\text{cm}^2$)	2600MHz	3500MHz	4900MHz
China GB8702-2014	40	40	40	46.7	65.3
International Committee on Non-Ionizing Radiation ICNIRP-2020, 30minsRMS average, whole	450	900	1000	1000	1000
America, Canada IEEE C95.1TM-2019, 30mins RMSaverage, whole	450	900	1000	1000	1000

Comparison of Typical Electromagnetic Radiation Limit Standards between China and the World

The comparison between the Chinese national standard GB8702-2014 and other typical electromagnetic radiation limit standards in the world (ICNIRP-2020, IEEE C95.1TM-2019)

The ICNIRP limit standards are adopted by many countries and regions in the world, followed by the standard limits of the IEEE system.

A National Standards

◆ GB21288-2007 Limits for human local exposure to electromagnetic fields emitted by mobile phones

GB21288 stipulates that the average specific absorption rate (SAR) of a mobile phone to any 10 g of biological tissue for any continuous 6 minutes shall not exceed 2.0 W/kg.

B Industry Standards

Currently, various industry standards that have been issued and effective are mainly formulated by the Ministry of Ecology and Environment (MEE) and the Ministry of Industry and Information Technology (MIIT). The detailed list is as follows. These standards specifically describe the technical management requirements and methods for various aspects of electromagnetic radiation from mobile communication base stations.

B Industry Standards

01	HJ1151-2020 Monitoring method for electromagnetic radiation environment of 5G mobile communication base station (Trial)
02	HJ 972-2018 Monitoring method for electromagnetic radiation environment of mobile communication base station (Formerly Document No. 114)
03	HJ/T 10.2-1996 Guidline on Management of Radioactive Environmental Protection - Electromagnetic Radiation Monitoring Instuments and Methods
04	HJ/T 10.3-1996 Guidline on Management of Radioactive Environmental Protection - Environmental Impact Assessment Methods and standards on Electromagnetic Radiation
05	YD/T 3137-2016 Evaluation Method for Compliance with Basic Limits of Electromagnetic Fields (10MHz to 300GHz) Exposure to Human Beings for Low Power Electronic and Electrical Equipment
06	YD/T 2830-2015 Technical Requirements for Electromagnetic Radiation Online Monitoring System
07	YD/T 3026-2016 Technical Requirements for Electromagnetic Radiation Management of Communication Base Stations
08	YD/T 2196-2010 General Requirements for Electromagnetic Protection Safety Management of Communication Systems
09	YD/T 2192-2010 Electromagnetic Radiation Mitigation Technology around Communication Base Stations
10	YD/T 3731-2020 Radio Frequency Electromagnetic Field Measurement and Compliance Determination of Human Exposure Limits for Operating Base Stations

THANKS!

Pro. Senior Guo-qing LI
liguoqing@caict.ac.cn
www.caict.ac.cn
www.cqcatr.com