

# HJ

## INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

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#### Monitoring method for electromagnetic radiation environment of mobile communication base station

移动通信基站电磁辐射环境监测方法

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### Foreword

In order to implement the "Environmental Protection Law of the People's Republic of China", prevent and control electromagnetic radiation environmental pollution, improve environmental quality, and standardize mobile communication base the station monitors the electromagnetic radiation environment and develops this standard.

This standard specifies the technical requirements for the content and method of electromagnetic radiation environment monitoring of mobile communication base stations.

This standard is the first release.

This standard was formulated by the Department of Environmental Protection's Radiation Source Safety Supervision Department.

This standard is mainly drafted by. Radiation Environmental Monitoring Technology Center.

This standard is approved by the Ministry of Ecology and Environment on September 30,

2018.

This standard has been implemented since January 01, 2019.

This standard is explained by the Ministry of Ecology and Environment.

Mobile communication base station electromagnetic radiation environment monitoring method

## **1 Scope of application**

This standard specifies the technical requirements for the content and method of electromagnetic radiation environment monitoring of mobile communication base stations.

This standard applies to the monitoring of electromagnetic radiation environment of mobile communication base stations outside the scope of exemption specified in GB 8702.

Exempted management the electromagnetic radiation environment monitoring of the mobile communication base station can be performed with reference to this standard.

## **2 Normative references**

The contents of this standard refer to the terms in the following documents. For undated references, the valid version applies to this standard.

GB 8702 electromagnetic environment control limit GB/T 2900.1 Basic terminology of electrical terminology HJ/T 10.2 Radiation Environmental Protection Management Guide Electromagnetic Radiation Monitoring Instrument and Method HJ/T 10.3 Radiation Environmental Protection Management Guidelines Electromagnetic Radiation Environmental Impact Assessment Methods and Standards

## **3 Terms and definitions**

The following terms and definitions apply to this standard.

### **3.1 Mobile communication mobile communication**

The two parties to the communication or at least one of them exchange information during the exercise. Such as moving bodies (people, vehicles, ships, airplanes) and fixed Communication between points or between mobile bodies.

### **3.2 Base station base station**

A terrestrial station in the land mobile service, a wireless transceiver device serving a cell or a plurality of cells at the same site. Base station passed the line interface provides a wireless channel to and from the terminal.

### **3.3 Electromagnetic radiation environment sensitive target electromagnetic radiation**

environment-sensitive target Electromagnetic radiation environment monitoring needs to focus on the object. Including residential, school, hospital, office building and factory, etc. Or study buildings.

#### **4.1 Environmental conditions**

The environmental conditions at the time of monitoring should be in accordance with the requirements of the instrument.

##### **4.2.1 Basic requirements**

The working performance of the monitoring instrument should meet the requirements of the electromagnetic field to be tested, and it can cover the transmitting frequency, range, and Resolution, etc. can meet the monitoring requirements.

According to the purpose of monitoring, the monitoring instruments can be divided into non-selective broadband electromagnetic radiation monitors and frequency selective electromagnetic radiation monitors. Moving on when monitoring the electromagnetic radiation environment of a mobile communication base station, a non-frequency selective broadband electromagnetic radiation monitor is used; in the need to understand a plurality of electromagnetic radiation sources, each when the electromagnetic radiation contribution of the radiation source is used, the frequency selective electromagnetic radiation monitor is used.

Monitoring instruments with isotropic response probes (antennas) should be used for monitoring.

The monitoring results of the monitoring instrument should be selected from the rms value reading of the instrument. For the rms value, see GB/T 2900.1.

##### **4.2.2 Non-frequency selective broadband electromagnetic radiation monitor**

It refers to the electromagnetic radiation monitor with the isotropic response value of the comprehensive value of the field strength at all frequency points in the instrument frequency range.

In the case of environmental monitoring using a non-selected broadband electromagnetic radiation monitor, in order to ensure the quality of environmental monitoring, such instruments should comply with HJ/T 10.2, the basic requirements for its electrical performance are shown in Table 1.

Table 1 Basic requirements for electrical performance of non-frequency selective broadband electromagnetic radiation monitor

Project indicator

Frequency response

800MHz~3GHz  $\pm 1.5$  dB

3GHz  $\pm 3$  dB

Dynamic Range

The lower detection limit of the probe is  $\leq 1.1 \times 10^{-4} \text{ W/m}^2$  (0.2 V/m) and the upper detection limit is  $\geq 25 \text{ W/m}^2$  (100 V/m) Isotropic response to the entire monitoring system to assess its isotropy, isotropic  $\leq 1$  dB

#### 4.2.3 Frequency selective electromagnetic radiation monitor

Refers to an electromagnetic radiation monitor capable of receiving and processing portions of the spectral components within the instrument's frequency range.

According to the specific monitoring needs, frequency selective electromagnetic radiation monitors with different ranges and different frequency ranges can be selected. These instruments should meet the requirements.

HJ/T 10.2, the basic requirements for its electrical performance are shown in Table 2.

Table 2 Basic requirements for electrical performance of frequency selective electromagnetic radiation monitor

Project indicator

#### 5.1 Basic requirements

Before conducting monitoring work, collect basic information of the mobile communication base station under test, including. base station name, operating unit, construction site, Longitude and latitude coordinates, network system type, transmission frequency range, antenna ground height, antenna bracket type, number of antennas, and operating status.

Other information may be collected depending on the nature and purpose of the monitoring, including. transmitter model, nominal power, actual transmit power, antenna Parameters such as gain, antenna directivity type, and antenna direction angle.

When monitoring with a non-selected broadband electromagnetic radiation monitor, if the monitoring result exceeds the evaluation criteria for individual items specified in HJ/T 10.3, the selected frequency should be selected and frequency-selected using a frequency selective electromagnetic radiation monitor to determine the work of the point in the range of the transmitting frequency range of the mobile communication base station.

Rate density (or electric field strength) value.