

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

HJ 1151-2020

**5G Mobile Communication Base Station Electromagnetic
Radiation Environmental Monitoring Method (Trial)**

5G移动通信基站电磁辐射环境监测方法（试行）

(English Translation)

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Foreword

In order to implement the "Environmental Protection Law of the People's Republic of China", protect the environment, prevent electromagnetic radiation environmental pollution, and standardize the 5G mobile communication base Environmental monitoring of electromagnetic radiation of the station, the formulation of this standard.

This standard specifies the technical requirements for the content and method of electromagnetic radiation environmental monitoring of 5G mobile communication base stations. This standard replaces Environmental Monitoring Methods for Electromagnetic Radiation of Information Base Stations (HJ 972-2018) as the electromagnetic radiation of 5G and mobile communication base stations co-located with other network standards Implementation standards for radio environmental monitoring.

This standard is issued for the first time.

Appendix A of this standard is an informative appendix.

This standard was formulated by the Department of Radiation Source Safety Supervision and the Department of Regulations and Standards of the Ministry of Ecology and Environment.

1 Scope of application

This standard specifies the technical requirements for the content and method of electromagnetic radiation environmental monitoring of 5G mobile communication base stations with operating frequencies less than 6 GHz.

This standard applies to the environmental monitoring of electromagnetic radiation of 5G mobile communication base stations. There are 5G and other network standards for mobile

communication at the same site Information base station, electromagnetic radiation environmental monitoring is implemented in accordance with the provisions of this standard.

2 Terms and definitions

The following terms and definitions apply to this standard.

2.1 Base station

A land station in the land mobile service is a wireless transceiver equipment that serves a cell or multiple cells on the same site. Base station passes without the wire interface provides a wireless channel with the terminal.

2.2 5G user equipment Terminal equipment that carries 5G mobile communication services.

2.3 Electromagnetic radiation environment-sensitive target

Objects that need to be focused on in the environmental impact assessment and monitoring of electromagnetic radiation. Including houses, schools, hospitals, office buildings, factories, etc.

The building where you live, work or study.

2.4 Application scenario

5G mobile communication application scenarios include. enhanced mobile broadband (eMBB), ultra-high reliability and low latency communication (uRLLC), large Large-scale machine communication (mMTC), such as data transmission, video interaction, game entertainment, virtual shopping, smart medical, industrial applications and vehicles Scenes such as networking.

3.1 Environmental conditions

The environmental conditions during monitoring should meet the requirements for the use of monitoring instruments.

3.2.1 Basic requirements

The working performance of the monitoring instrument should meet the requirements of the electromagnetic field to be measured. The detection method of the monitoring instrument is the root-mean-square detection method.

The reading is the average of any continuous 6 minutes.

When monitoring, a frequency-selective electromagnetic radiation monitor should be used, and the monitoring frequency should be selected when the transmitting antenna of the

mobile communication base station under test is working.

Line frequency band.

When conducting electromagnetic radiation environmental monitoring for mobile communication base stations with 5G and other network standards at the same site, use frequency-selective electromagnetic radiation the list mode of the radio monitor can obtain the electromagnetic radiation field strength data of 5G and other network standard mobile communication base stations.

During monitoring, if the probe (antenna) of the monitoring instrument is an isotropic probe, it should meet the isotropic index requirements in Table 1; if a non-isotropic probe is used, the influence of antenna directivity should be considered, and the antenna factor and other parameters should be synthesized during the result processing.

Adjust the detection direction until the maximum field strength value is measured; the support of the monitoring instrument should be made of a non-conductive material that is not susceptible to moisture.

3.2.2 Basic requirements for electrical performance of frequency selective electromagnetic radiation monitor the frequency-selective electromagnetic radiation monitor refers to the ability to receive and process the spectral components of a specific emission within the response frequency range of the instrument the basic requirements for electrical performance of the field quantity monitoring instrument are shown in Table 1.

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

4.1 Data collection

Before starting the monitoring work, the basic information of the tested 5G mobile communication base station should be collected, including. base station name, operating unit, construction site Point, transmitting frequency range, antenna support type, number of antennas, operating status and height of antenna from the ground, etc.

According to the nature and purpose of monitoring, other information can be collected, including. latitude and longitude coordinates, transmitter model, nominal power, and actual transmission Power, antenna gain, average load, antenna downtilt angle (mechanical downtilt angle electronic downtilt angle), antenna lobe width (horizontal width, vertical Straight width) and antenna pattern and other parameters.

Mobile communication base stations with other network standards at the same site should also collect the same basic information.

4.2 Monitoring factors

The monitoring factor of the electromagnetic radiation environment of the mobile communication base station is the radio frequency electromagnetic field, and the monitoring parameter is the power density.

4.3 Monitoring points

The monitoring points should be arranged at the electromagnetic radiation environment-sensitive targets within the coverage of the antenna of the mobile communication base station, and should be arranged in public residential areas first.

Live, work or study at the closest place to the antenna, but it is not suitable to be deployed where tools (such as ladders) or special methods (such as climbing) are needed to reach s position.

When monitoring in a building, the monitoring point can be placed at the position of the window (balcony) facing the base station antenna, and the probe (antenna) tip of the monitoring instrument the end should be within the window frame (balcony) interface, and it can also be arranged in other indoor locations. Between the monitoring instrument probe (antenna) and household appliances and other equipment the distance is not less than 1m.

4.4 Monitoring height

The probe (antenna) of the monitoring instrument is 1.7m away from the ground (or standing plane). You can also select the monitoring height according to different purposes, and Noted in the report.

4.5 Monitoring working conditions and 5G terminal equipment

During monitoring, the monitored mobile communication base station should be in normal working condition, and the 5G terminal equipment should be built with the monitored 5G mobile communication base station.

It is connected to at least one typical application scenario.

During monitoring, the probe (antenna) of the monitoring instrument is placed on the support of the monitoring instrument, and the distance between the tip of the probe (antenna) and the operator's torso not less than 0.5m, and kept within the range of 1m to 3m with 5G terminal equipment; avoid or minimize other sources of electromagnetic radiation that occasionally occur nearby Interference and monitoring instrument bracket leakage current.