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**General radar station design standards**

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### 1 General

1.0.1 This standard is formulated to standardize the design content and depth of general radar station projects, improve the design level of such projects, achieve advanced technology, save energy, protect the environment, be economically reasonable and ensure quality.

1.0.2 This standard is applicable to the design of new construction, expansion and reconstruction of general radar stations.

1.0.3 In addition to implementing this standard, the general radar station design should also comply with the current relevant national standards.

#### 2.0.1 general radar station

Refers to the general designation of buildings (structures), venues and radar equipment that are built to meet the requirements of various civilian radars and ensure the operation of radars and duty stations.

#### 2.0.2 weather radar weather radar

It is a detection device that detects the spatial distribution of precipitation by using the scattering and absorption characteristics of electromagnetic waves by precipitation particles such as clouds, fog, rain, and snow.

### **2.0.3 wind profile radar**

It is a remote sensing device for high-altitude wind field detection by launching electromagnetic beams in different directions at high altitudes, receiving and processing the information returned by these electromagnetic beams due to the uneven vertical structure of the atmosphere.

### **2.0.4 primary surveillance radar primary surveillance radar**

It is an active surveillance radar that detects by emitting electromagnetic waves, uses the echo signals of air targets to find targets, and performs parameter measurement to obtain distance, azimuth and relative speed information.

### **2.0.5 secondary surveillance radar secondary surveillance radar**

It is a surveillance radar that transmits an inquiry signal through a ground interrogator and receives a response signal from an aircraft equipped with an airborne response device in the air, and then obtains various information about the aircraft.

### **2.0.6 surface movement radar**

It is a radar that detects surface targets by emitting electromagnetic waves and using the echo signals of targets, including airport surveillance radars and port surveillance radars.

### **2.0.7 radome**

With good electromagnetic wave penetration characteristics, the thin shell structure used to protect the radar antenna feed system from the external environment is mostly a truncated sphere.

## **3 Classification and composition of general radar stations**

3.0.1 General radar stations mainly include weather radar stations, air traffic surveillance radar stations and surface surveillance radar stations. The typical radars applicable to each station type should be selected according to Table 3.0.1.

3.0.2 The general radar station shall consist of equipment, buildings (structures) and sites, and shall meet the following requirements.

1 The equipment of a general radar station shall consist of radar equipment and auxiliary facilities. Radar equipment should include outdoor units and indoor equipment. Auxiliary facilities should include radome, power supply and distribution equipment, water supply and drainage fire protection equipment, HVAC equipment, communication network equipment, lightning protection facilities, grounding facilities, security and environmental monitoring and other facilities.

2 The buildings (structures) of general radar stations should be composed of radar antenna platform, radar room, auxiliary room and auxiliary room. The zoning of radar station buildings (structures) should be uniformly planned in conjunction with the overall layout of the radar station. The arrangement of equipment in the partition shall meet the requirements of Table 3.0.2.

3 The site of the general radar station should be composed of roads in the station, parking spaces, green spaces, etc.

**4.0.2 The radar antenna can be erected on a high platform or on a flat ground (Figure 4.0.2-1 and Figure 4.0.2-2).**

4.0.3 The climatic environment of the general radar station shall meet the requirements for detection and operation of radar equipment. When the climate environment such as temperature, humidity, wind speed and salt fog concentration does not meet the requirements, it is advisable to add a radome. When the average maximum wind speed in the area where the general radar station is located exceeds the requirements in Table 4.0.3, a radome should be installed.

4.0.4 When the ambient maximum gust speed is greater than 65m/s, special design requirements should be put forward to the radome supplier. The wind environment conditions of the radar station should be determined according to the meteorological data of the area.

**4.0.5 When installing a radome, the center of the radome should coincide with the rotation center of the antenna.**

4.0.6 When the outdoor cabinet needs to be installed with a foundation, it should be designed according to its technical requirements.

4.0.7 The working areas of radar antenna tower, radar machine room and power distribution room must be equipped with access control. The antenna working area in the radar antenna tower should be equipped with an emergency brake linkage device.

4.0.8 The layout of the radar machine room cabinets of the general radar station shall comply with the relevant provisions of the current national standard "Data Center Design Code" GB 50174.

4.0.9 The location of the radar host system cabinet should meet the requirement that the waveguide port be aligned with the waveguide window.

4.0.10 The cables in the computer room of the general radar station shall be laid in the metal shielding bridge, and the strong and weak currents should be laid separately, and shall comply with the relevant provisions of the current national standard "Code for Design of Integrated Wiring System Engineering" GB 50311.

## **5.1 Site selection**

5.1.1 The site of the general radar station should be located in a relatively high-lying area, and should avoid the seismic zone, flood area, and geological disaster-prone area.

5.1.2 The general radar station should choose the surrounding open area. There should be no obstacles that affect the detection effect within the coverage required by the detection.

5.1.3 The newly built general radar station shall not affect the operation of existing legal facilities in the surrounding area.

5.1.4 The electromagnetic environment of the general radar station site should meet the needs of the normal operation of the radar.

5.1.5 The general radar station should keep a safe distance from substations, electrified railways, highways, high-voltage transmission (distribution) lines and other facilities with electrical interference sources.

5.1.6 The general radar station shall comply with the relevant provisions of the current national standard "Electromagnetic Environment Control Limits" GB 8702.

### **5.1.7 General radar stations should be kept away from strong noise sources and strong vibration sources.**

5.1.8 General radar stations should avoid sources of smog, dust and harmful gases, and places where corrosive, flammable and explosive substances are produced or stored.

5.1.9 The site of the general radar station should be selected at a location convenient for power supply, water supply, transportation and communication.

## **5.2 General layout**

5.2.1 The overall layout of the general radar station should be compact and reasonable, saving land. The land area of the radar station shall meet the requirements in Table 5.2.1.

5.2.2 The layout of the built-in (structure) buildings of the general radar station shall make reasonable use of the terrain and shall comply with the relevant provisions of the current national standard "Code for Fire Protection Design of Buildings" GB 50016.

5.2.3 The location of the radar antenna tower should be convenient for antenna hoisting, and the antenna hoisting site should be reserved.

### **5.2.4 The general radar station auxiliary room, auxiliary room and radar room can be built together.**

5.2.5 The access road to the general radar station should be concrete or asphalt pavement, and the road width should not be less than 3.5m. When the length of the access road