



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

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Code for design of city gas engineering

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1 General

1.0.1 In order to promote the high-quality development of urban and rural gas, prevent and reduce gas safety accidents, ensure continuous and stable gas supply, and protect personal, property and public safety, this specification is formulated.

1.0.2 Gas engineering projects in cities, towns and villages must implement this specification. This specification does not apply to the following engineering projects.

- 1 The long-distance gas transmission pipeline project before the town gas gate station;
- 2 Gas engineering projects for internal production of industrial enterprises;
- 3 Biogas and straw gas production and utilization projects;
- 4 Gas application projects on ocean and river ships, railway vehicles, automobiles and other means of transportation.

1.0.3 Gas engineering should realize continuous and stable gas supply and complete operation, and should follow the following principles.

- 1 Comply with national energy, ecological environment, land use, disaster prevention and reduction, emergency management and other policies;
- 2 to protect personal, property and public safety;
- 3 Encourage engineering technology innovation;
- 4 Actively adopt modern information technology;
- 5 Improve the quality of project construction and the level of operation and maintenance.

1.0.4 Whether the technical methods and measures adopted in the project construction

meet the requirements of this specification shall be judged by the relevant responsible parties. Among them, innovative technical methods and measures should be demonstrated and meet the performance requirements in this specification.

2.1 Scale and layout

2.1.1 The scale of gas consumption for gas projects should be determined based on conditions such as urban and rural development, population size, user demand, and gas supply resources, through market surveys, scientific forecasts, and comprehensive analysis combined with gas consumption indicators and gas consumption laws.

2.1.2 The selection of gas source shall be based on the national energy policy, following the principle of energy conservation, environmental protection, stability and reliability, considering the available resource conditions, and shall be determined by technical and economical demonstration.

2.1.3 The gas supply system shall have a gas supply capacity reserve to meet peak shaving supply and emergency supply. The gas supply capacity reserve should be determined according to the requirements of gas source conditions, supply and demand balance, system scheduling and emergency response.

2.3.5 During the operation process of gas facilities that may leak gas, special personnel should be supervised, and no single operation is allowed. Before the cause of the gas leakage is found out or the leakage is not eliminated, effective safety measures should be taken until the gas leakage is eliminated.

2.3.6 On-site operation of gas facilities shall comply with the following regulations.

1 Operators should be proficient in the knowledge and skills of gas characteristics, related processes and emergency disposal;

2 The operation area should be marked for operation or emergency repair work, and guardrails and warning signs should be set up at the boundary of the area;

3 Operators or emergency repair personnel should wear anti-static work clothes and other protective equipment, and should not put on, take off and take off protective equipment in the work area;

4 Do not carry mobile phones, matches or lighters and other ignition sources in the operation or emergency repair work area, and do not wear clothing that is prone to sparks.

2.3.7 Process wastes that do not meet the emission standards during the normal operation of gas facilities shall not be discharged directly.

3.0.1 The gas quality supplied by the gas project shall meet the following requirements.

- 1 It should meet the gas classification and gas quality standards stipulated by the state;
2. It should meet the needs and conditions of various users and gas consumption;
3. Calorific value (calorific value) should be kept stable;

4 Changes in components should ensure the normal operation of the burner.

3.0.2 The gas supplied by the system shall determine the base calorific value (calorific value), and the variation of the calorific value (calorific value) shall be within $\pm 5\%$ of the reference calorific value (calorific value). Gas parameters such as gas composition and impurity content, dew point temperature, and gas contact point pressure should be determined according to gas source conditions and gas demand.

3.0.3 The quality of natural gas and shale gas, coalbed methane, coal-based natural gas, biomass gas, etc. delivered according to the quality of natural gas shall meet the following requirements.

- 1 The quality of natural gas shall meet the requirements in Table 3.0.3.
- 2 Under the pressure and temperature conditions of the natural gas transfer point, the hydrocarbon dew point of the natural gas should be 5°C lower than the minimum ambient temperature; there should be no solid, liquid or gelatinous substances in the natural gas.

3.0.4 The quality of liquefied petroleum gas shall meet the requirements in Table 3.0.4.

3.0.5 The quality of artificial gas shall meet the requirements in Table 3.0.5.

3.0.6 When the quality of the gas source does not meet the quality requirements specified in Articles 3.0.2 to 3.0.5 of this code, the gas shall be processed.

4.2.15 The power supply of gas plants and stations shall meet the requirements of normal production and fire protection. The electricity used for equipment related to production safety and fire protection in the station shall be powered by two circuits, or single circuits with backup power supply.

4.2.16 The gas station instrument control system should be equipped with an uninterruptible power supply device.

4.2.17 In gas plants and stations where the leakage concentration of combustible gas may reach 20% of the lower explosion limit of gas facilities or buildings (structures), fixed combustible gas concentration alarm devices shall be installed.

4.2.18 The electrical and instrumentation devices installed in the explosion-hazardous environment in the gas station shall have the explosion-proof performance corresponding to the explosion-hazardous level of the area.

4.2.19 In the explosion-hazardous area of the gas plant and station, the storage tanks, equipment and pipelines that may cause static electricity hazards should adopt static electricity dissipation measures.

4.2.20 When entering the gas storage tank area, surge room (box), compressor room, metering room, bottle group gasification room, valve room and other places where gas may leak, the concentration of combustible gas, harmful gas and oxygen should be tested to meet the Access is only possible under safe conditions. The emergency evacuation route diagram shall be marked in a conspicuous position in the gas plant and station.

4.2.21 Except for special gas transport vehicles and emergency vehicles equipped with fire extinguishing devices, other motor vehicles are not allowed to enter the liquid gas storage and filling area.

4.3 Tanks and cylinders

4.3.1 Liquefied natural gas and liquefied petroleum gas storage tanks with a volume greater than 10m³ should not be fixedly installed in buildings. Filled or gas-filled LNG cylinders must not be stored in the building.

4.3.2 Gas storage tanks should be equipped with monitoring devices such as pressure, temperature, tank capacity or liquid level display, and should have an over-limit alarm function. Atmospheric pressure storage tanks for liquefied natural gas should be equipped with density monitoring devices. Gas storage tanks should be equipped with safety relief devices.

4.3.3 The liquid phase inlet and outlet pipes of LNG and LPG storage tanks shall be provided with emergency cut-off valves interlocked with the liquid level control of the storage tanks.

4.3.4 The foundation of low-temperature gas storage tanks and equipment shall be equipped with soil temperature detection devices, and measures to prevent soil frost heaving shall be taken.

4.3.5 When the height of the gas storage tank exceeds the relevant local height limit regulations, flight obstruction lights and signs shall be provided.

4.3.6 Effective anti-settlement and anti-seismic measures shall be taken for the inlet and outlet pipelines of gas storage tanks, and cut-off devices shall be installed.

4.3.7 The safety valve of the gas storage tank shall be selected according to the characteristics of the stored gas and the conditions of use, and shall meet the following requirements.