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

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**Guidelines for the operation and management of industrial
reuse water treatment facilities**

工业回用水处理设施运行管理导则

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1 Scope

The document lays down the general requirements, the management systems, the operation and maintenance, and the safety and emergency response for the operation and management of industrial reuse water treatment facilities.

It applies to the operation and management of reuse water treatment facilities in industrial enterprises and industrial parks whose raw water is the effluent of secondary treatment.

2 Normative references

The normative references listed are GB 2894, GB 3095, GB 16297, GB/T 18920, GB/T 19249, GB/T 19923, GB/T 20103, GB/T 21534, GB/T 37136, GB/T 45001, GB 50013, GB 50014, CJJ 60, CJJ/T 243, DL/T 572 and DL/T 814. For dated references only the edition corresponding to that date applies; for undated references the latest edition, including all amendments, applies.

3 Terms and definitions

The terms and definitions given in GB/T 19249, GB/T 20103, GB/T 21534, GB 50013 and GB 50014 apply to the document. No further term is defined.

4 General requirements

4.1 Industrial enterprises should follow the principle of source control, raise the rate of resource use and reduce the generation and the discharge of wastewater.

4.2 On the basis of the industry type, the water quality, the water quantity, the reuse requirements, the discharge standards and the water-saving targets, industrial enterprises consider wastewater reuse in a systematic way around process recycling and reuse, in the form of cascade water use, quality-matched water use and stepwise use; they select treatment facilities that are technically and economically reasonable and that meet the requirements of the corresponding standards.

4.3 Industrial parks strengthen overall planning and coordination and carry out classified collection, graded treatment and quality-matched reuse of wastewater.

4.4 Industrial enterprises and industrial parks above the designated size should build or upgrade a digital management and control platform, so as to raise the level of digital management, networked coordination and intelligent control of industrial wastewater reuse in monitoring, early warning, emergency response and similar areas.

4.5 The operation and management measures drawn up by industrial enterprises and industrial parks for industrial reuse water treatment facilities follow the document and also meet the requirements of the relevant national standards in force.

5 Management systems

5.1 A systematic and standardized operation management system is set up; its implementation is checked periodically and it is updated in good time.

5.2 Posts are established for management, operation, laboratory testing and maintenance, with defined post duties and division of work. Before taking up a post, personnel receive professional skills training and safety education training, take up the post after passing, and

are then assessed on a rolling basis.

5.3 An inspection and maintenance system for equipment and facilities is set up. The daily operating records include equipment operation records, patrol inspection records, water quality testing records, chemical use records, routine repair and maintenance records, overhaul and replacement records, accident records and shift handover records, as shown in Annex A.

5.4 A records management system is set up, covering the relation between records management and all the procedures of operation management. All the procedures and processes of operation management are recorded, backed up and filed completely and accurately, including the original documentation of the facilities, the daily operating records and the technical documentation. The original documentation of the facilities covers procurement, design, construction, commissioning and acceptance.

6 Operation and maintenance

6.1.1 Industrial enterprises and industrial parks strengthen the monitoring of wastewater quantity and quality and, on the basis of the changes in quantity and quality, guide the stable operation of the facilities.

6.1.2 Key water quality control points and water quality monitoring points are set according to the process flow and to the quality requirements for the reused wastewater.

6.1.3 Reuse water used as make-up water for circulating cooling systems complies with GB/T 19923; reuse water used as process water meets the requirements of the corresponding process; reuse water used for miscellaneous purposes complies with GB/T 18920.

6.1.4 When the reuse water fails the water quality test, supply is stopped at once and switched to the standby water source, corrective action is taken in good time, and operation is resumed only after the water quality passes.

6.2.1 Regulating facilities are adjusted according to the changes in the quantity and the quality of the incoming water, so that quality and quantity are evened out and stay within a reasonable range.

6.2.2 For biological treatment facilities the incoming water is distributed evenly among the tanks and, for aeration tanks with several inlet points, the inflow is distributed reasonably; the dissolved oxygen (DO) is controlled in accordance with the relevant provisions of CJJ 60 according to the different process requirements; pH, dissolved oxygen (DO), water temperature, chemical oxygen demand (COD) and similar indicators are monitored on line in real time and the data are uploaded in good time; the colour, the state and the smell of the activated sludge should be observed and, when something abnormal appears, the mixed liquor suspended solids (MLSS), the sludge settling ratio (SV) and similar indicators

are tested and the operating conditions adjusted; the operation of the aeration device should be observed periodically, the aeration kept even and fouling or clogging repaired in good time; the fault finding and handling methods for biological treatment facilities are given in B.1 of Annex B.

6.2.3 For coagulation clarification (sedimentation) facilities the flow, the operating water level, the pH and the dosing rate are adjusted and the hydraulic surface loading, the sludge level and similar quantities are controlled, so that the operating parameters of the facilities stay within the design range; the suspended solids, the hardness and the alkalinity of the inlet and outlet water are tested periodically so as to secure the quality of the outlet water; the fault finding and handling methods are given in B.2.

6.2.4 For media filtration facilities the filtration rate is kept stable and large fluctuations are prevented; the backwash method, the backwash frequency and the backwash duration are adjusted according to the operating pressure difference or to the change in inlet and outlet water quality; when filter media overflow during backwashing the backwash parameters are adjusted, and when backwashing can no longer restore the performance of the media the media are replaced.

6.2.5 For ozone (catalytic) oxidation facilities the ozone generation system meets the following requirements: the ozone gas transfer pipework and the gas distribution system are checked for clear passage before start-up and the equipment may be started only when the inlet gas requirements are met; after the system is shut down the gas path continues to be purged so that no ozone remains; the current, the voltage, the gas production and the gas supply during operation are observed and recorded daily; the ozone concentration detection and alarm devices are calibrated periodically and the ozone concentration in the off-gas complies with GB 3095; an emergency plan is started in case of ozone leakage; the filter element of the inlet gas filter is replaced at once when it is badly fouled; and when the ozone production falls short of the design value the ozone generation system is checked and repaired according to the fault indications. The ozone (catalytic) oxidation device meets the following requirements: the ozone transfer pipework is inspected periodically to prevent leakage caused by damage or ageing, and the monitoring instruments are calibrated periodically so that the monitoring data are accurate.

6.2.6 For ultrafiltration (microfiltration) facilities the product water and concentrate flow, the inlet and outlet water pressure, the product water turbidity and similar operating parameters are recorded and the changes in transmembrane pressure difference and in product water flow are monitored, so as to secure the quantity and the quality of the product water; the method, the frequency and the duration of backwashing and flushing are adjusted according to the transmembrane pressure difference, the product water flow and the change in water quality; during chemical cleaning the colour and the pH value of the cleaning solution are observed and the dosing is adjusted or the solution replaced; during chemical cleaning the temperature of the cleaning solution is kept below the operating