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NATIONAL ENVIRONMENTAL PROTECTION STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

HJ 355-2019

Replacing HJ/T 355-2007

Technical specification for operation of wastewater on-line monitoring system (COD_{Cr}, NH₃-N et al.)

水污染源在线监测系统（COD_{Cr}、NH₃-N 等）运行技术规范

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Technical specification for operation of wastewater on-line monitoring system (COD_{Cr}, NH₃-N et al.)

1 Scope of application

This Standard specifies the requirements for the operating organization and personnel, parameter management and setting, sampling methods and data reporting, inspection and maintenance, operation technical and quality control, system maintenance and troubleshooting, archive records that the operating organization shall meet, so as to ensure the stable operation of on-line monitoring equipment for wastewater. It also specifies the specific content of operation comparison monitoring.

This Standard is applicable to the operation of wastewater on-line monitoring equipment such as various components of the wastewater on-line monitoring system that has been accepted by HJ 354 and the flow meter, automatic water-quality sampler, chemical oxygen demand (COD_{Cr}) water automatic analyzer, total organic carbon (TOC) water automatic analyzer, ammonia nitrogen (NH₃-N) water automatic analyzer, total phosphorus (TP) water automatic analyzer, total nitrogen (TN) water automatic analyzer, thermometer, pH water automatic analyzer. This Standard is applicable to the daily operation and management of operating organization of wastewater on-line monitoring system.

2 Normative references

The following documents contain the provisions which, through reference in this Standard, become the provisions of this Standard. For undated reference documents, the latest versions apply to this Standard.

GB/T 6920, *Water-quality - Determination of pH Value - Glass Electrode Method*

GB/T 11893, *Water-quality - Determination of total phosphorus - Ammonium molybdate spectrophotometric method*

GB/T 13195, *Water-quality. Determination of water temperature. Thermometer or reversing thermometer method*

GB 18597, *Standard for pollution control on hazardous waste storage*

HJ 15, *Technical specifications and test procedures for ultrasonic open*

emissions.

3.3 instantaneous sample

The water-sample that is collected at one time at a sampling point.

3.4 composite sample

A mixture of water-samples that are collected at a same sampling point continuously or at different times.

3.5 automatic water sampling system

A system in wastewater on-line monitoring system that is used to collect the instantaneous sample and the composite sample, for over-standard sample retention, to parallelly monitor sample retention, to compare monitoring sample retention. It is used for the wastewater on-line monitoring equipment to analyze and test.

3.6 on-line monitoring equipment operating parameters

Relative parameters that are set on the wastewater on-line monitoring equipment installed on site, that can characterize the measurement process and have influence on the measurement results.

3.7 data availability

In a certain period, the ratio of the number of valid data actually obtained by the instrument to the number of valid data that shall be obtained in the period.

3.8 maintenance state

The state of wastewater on-line monitoring system when it is performing maintenance operation during abnormal sampling monitoring period, including instrument maintenance, overhaul, calibration, and maintenance of automatic water sampling system.

3.9 auto-check with standard solution

The accuracy of wastewater on-line monitoring equipment to automatically measure standard solution and automatically determine the measurement results.

4 Operating organization and personnel

4.1 Requirements for operating organization

enabled.

6 Requirements for sampling methods and data reporting

6.1 Sampling methods

6.1.1 Instantaneous sampling

Use pH water automatic analyzer, thermometer and flow meter to monitor the instantaneous sample. During continuous discharging, obtain a monitored data per 10min for pH value, temperature and flow. During intermittent discharge, the amount of data is not less than 6 times the cumulative discharge hours of sewage.

6.1.2 Composite sampling

Use COD_{Cr}, TOC, NH₃-N, TP, TN water automatic analyzer to monitor the composite sample.

During continuous discharging, start timing from 0's clock every day. Every 1h shall be a time period. The automatic water sampling system performs time proportional or flow proportional sampling during this time period (for example, conduct sampling every 15min and collect 4 times of water-samples within 1h to ensure that the number of samples collected during this period meets the requirements). Use water automatic analyzer to test the composite sample of this time period. The test result shall be calculated as the average continuous discharge concentration of wastewater of this time period.

During intermittent discharging, every 1h shall be a time period. The automatic water sampling system performs time proportional or flow proportional sampling during this time period (set according to the actual discharge amount on site to ensure that water-samples can be collected during discharge). After sampling ends, the water automatic analyzer shall test the composite sample of this time period. The test result shall be calculated as the average discharge concentration of wastewater of this time period. If the number of samples collected during a sampling period cannot meet the needs of instrument analysis, no data is processed for this period.

6.2 Data reporting

6.2.1 It shall ensure that the data acquisition and transmission instrument and online monitoring equipment are consistent with the time of monitoring center platform.

electrode filling solution is normal. Clean the electrode probe if necessary.

7.2.5 Check whether the standard solutions and reagents of each wastewater on-line monitoring equipment are within the valid use period, so as to guarantee regular replacement of standard solutions and reagents in accordance with relevant requirements.

7.2.6 Check the operation of the data acquisition and transmission instrument and inspect whether the joints are damaged. Conduct sampling inspection of data. Compare whether the data received by the wastewater on-line monitoring equipment, data acquisition and transmission instrument, and monitoring center platform are consistent.

7.2.7 Check whether the automatic water sampling system pipeline is clean, whether the sampling pump, sampling barrel and sample retention system are working properly, and whether the temperature of the sample retention and storage is normal.

7.2.8 If gas cylinders are used at some stations, check whether the carrier gas system is sealed and whether the air pressure meets the requirements for use.

7.3 Monthly inspection and maintenance

7.3.1 The monthly on-site maintenance shall include the maintenance of the wastewater on-line monitoring equipment and the instrument analysis system. Check the working state of the data storage or control system. Check the grounding of the monitoring equipment. Check the lightning protection measures of the monitoring station-room.

7.3.2 Wastewater on-line monitoring equipment: According to the corresponding instrument operation and maintenance instructions, check and maintain consumable parts; replace if necessary. Check and clean the sampling units, digestion units, detection units and metering units.

7.3.3 Automatic water sampling system: Replace the peristaltic pump tube and clean the mixed sampling bottle according to the situation.

7.3.4 TOC water-quality analyzer: Check if TOC-COD_{Cr} conversion factor is applicable. Correct if necessary. Check the temperature of the pump, tube, and furnace of the TOC water automatic analyzer once. Check the remaining reagent amount (add or replace if necessary). Check the halogen scrubber, condenser water-sealed container, humidifier, and add distilled water if necessary.

7.3.5 pH water automatic analyzer: Use acid liquor to clean the electrode once. Check if pH electrode is passivated. Calibrate or replace if necessary.

x -- Measured value of analyzer, mg/L.

8.2.1.2 If the automatic calibration and verification time of the on-line monitoring equipment exceeds 6h, it shall take manual monitoring method to report data to corresponding environmental protection authority. Data reporting is not less than 4 times per day. The interval must not exceed 6h.

8.2.1.3 The maximum interval of auto-check with standard solution cycle must not exceed 24h. The maximum interval between calibration cycles must not exceed 168h.

8.2.2 Comparison test of actual water-samples

8.2.2.1 For COD_{Cr}, TOC, NH₃-N, TP, TN water automatic analyzer, it shall carry out the comparison test of actual water-samples at least once per month. The test results shall meet the requirements for performance indicators in Table 1. When the results of comparison test of actual water-samples cannot meet the requirements for performance indicators in Table 1, it shall calibrate the instrument and verify the standard solution first before conducting the comparison test of actual water-samples.

8.2.2.2 If the comparison test results of actual water-samples of the second time still fail to comply with the provisions of Table 1, the instrument shall enter the maintenance state. At the same time, during the period from this comparison test of actual water-samples to the previous automatic instrument calibration or auto-check with standard solution (automatic instrument calibration specified in 8.2.1), all data shall be in accordance with the relevant provisions of HJ 356.

8.2.2.3 When the instrument maintenance time exceeds 6h, it shall take manual monitoring method to report data to corresponding environmental protection authority. Data reporting is not less than 4 times per day. The interval must not exceed 6h.

8.2.2.4 According to the water-sample collection port specified in HJ 353, collect actual wastewater discharge samples. Use water automatic analyzer and national environmental monitoring and analysis method standard (see Table 2) to respectively analyze the same water-sample. Two measurement results form a measurement data pair. Obtain at least three measurement data pairs. According to formula (2) or formula (3), calculate the absolute error or relative error of comparison test of actual water-samples. The results shall comply with the provisions of Table 1 in this Standard.

it shall rush to the site to deal with it within a specified time and eliminate the fault. Install a backup instrument if it cannot handle timely.

9.4 After the wastewater on-line monitoring equipment is repaired, before normal use and operation, it shall ensure that all repairs are completed and passed calibration and comparison tests. If the on-line monitoring equipment is replaced, before normal use and operation, it shall ensure that all its performance indicators shall meet the requirements of Table 1 of this Standard. A comparison test report can be issued for repaired and replaced instruments by a third party or operating organization.

9.5 If the data acquisition transmission instrument fails, it shall be repaired or replaced within the time specified by the corresponding environmental protection management department, and it can ensure that the collected data shall not be lost.

9.6 The operating organization shall have sufficient spare parts and spare equipment. Check its usage regularly and make additional purchases according to actual needs.

9.7 When the wastewater on-line monitoring equipment cannot work as normal due to failure or maintenance reasons, it shall report to corresponding environmental protection management department timely. When necessary, use manual monitoring. The interval of monitoring cycle is not more than 6h. Data reporting is not less than 4 times per day. Refer to HJ 91.1 for the monitoring technical requirements.

10 Operational comparison monitoring requirements

10.1 Operation management

The operation management shall be carried out from parameter setting and management, inspection and maintenance, auto-check with standard solution, automatic calibration, comparison test, maintenance and troubleshooting, comparison monitoring, records and archives. See Annex J for the operation checklist.

10.2 Comparison monitoring requirements

10.2.1 Comparison monitoring test device

According to the comparison analysis items and HJ 493 requirements, conduct daily cleaning, maintenance and organization of sampling apparatus required for comparison test.

10.2.2 Sample collection and storage

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