

Discussion on the Application of Monitoring Technology for Fixed Source Air Pollutants in Environmental Monitoring

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ABSTRACT

With the continuous development of our country's social economy, a large number of harmful substances are discharged into the atmosphere which cause great pollution to the environment. At the same time, there are many kinds of harmful substances in the atmosphere, so it is necessary to supervise the air pollutants. This paper will discuss the current situation of air pollution supervision, the development of supervision technology, the effect of environmental monitoring on air pollution control and the methods of strengthening the environmental monitoring.

Keywords: *Environmental monitoring; Supervision technical; Application*

1. INTRODUCTION

The work of air pollution environmental monitoring in China started late and the awareness of the hazards of air pollution is also insufficient. The continuous serious haze weather and the serious excess of pollutants have gradually attracted people's attention to environmental monitoring. In the process of air pollution control, it is also necessary to strengthen the monitoring of air pollutants to facilitate the identification of pollution sources and hazards caused so that better governance can be carried out.

2. OVERVIEW OF AIR POLLUTION

In the long-term of human life and production, a large number of pollutants will be discharged to nature. When the emission of pollutants reaches the scope that the external environment cannot bear, it will lead to the deterioration of the surrounding atmospheric environment quality. For air pollution, there are two main sources of pollution, one is natural pollution and the other is man-made pollution. Natural pollution is mainly the pollution emitted by nature itself, mainly carbon dioxide and other polluting gases emitted by volcanic eruptions; man-made pollution mainly includes automobile exhaust pollution, industrial waste gas pollution and domestic waste gas pollution, etc. and these man-made pollutions are the main causes of air pollution.

3. CURRENT SITUATION OF AIR POLLUTANT SUPERVISION

3.1 Low level of management

From the perspective of environmental monitoring in China, due to different regions, the situation of monitoring also varies greatly. In addition, the foundation of monitoring is weak which limits the development of science and technology to a certain extent and has also led to the lack of rapid development in the field of environmental quality monitoring in China. In actual environmental monitoring work, there is a large gap between the use of equipment and instruments compared with developed countries and the overall technical level is also relatively low. The economic development gap of various regions in China is large which also hinders the development of environmental protection.

3.2 Ineffective operation of the regulatory system

Judging from the actual situation of environmental monitoring quality management in China, although the establishment of the system has achieved certain results, there are still many problems in China's environmental monitoring quality management system that have not been resolved. Some institutions have not realized its importance. Others feel that environmental monitoring has affected their own daily work, and there are also certain losses in human and financial resources which have affected their own development. In addition, there are still many environmental regulatory agencies that lag behind in

their daily work. They just did some superficial writing work, but did not really implement the relevant work.

3.3 Low level of the comprehensive quality of the staff

From the perspective of environmental monitoring managers, most of them are lack of professional quality and there are few high-quality talents which will lead to the neglect of work quality management by many environmental monitoring workers to a certain extent. Therefore, in the face of such a phenomenon, it is necessary to strengthen the quality training of staff, change their working attitude, and make them realize the importance of this work so that the quality of environmental monitoring can be better improved and the environmental quality of our country can be actively improved.

4. OVERVIEW OF NEW REGULATORY TECHNOLOGY DEVELOPMENT

4.1 Common methods for monitoring air pollution

For the monitoring of air pollution, the most common methods are the physical detection methods of instrumental analysis and the methods of using chemical tests. In addition, there are monitoring methods for solid particle and gaseous pollutant.

The solid particle monitoring system mainly uses the laser scattering method, which monitors according to the principle of solid particle scattering light and can accurately record relevant data. However, for the laser scattering method, the equipment is expensive and limited in the scope of use.

The monitoring of gaseous pollutants mainly includes dilution sampling, complete sampling and direct measurement. The dilution sampling is to dilute the dry air to directly measure the dry flue gas which eliminates the influence of moisture on the measurement results. This method is not only highly accurate, but also practical. However the measurement requires additional relevant instruments. Direct measurement means that the testing instrument is placed directly in the tested place for monitoring. The overall maintenance workload is small, but because it needs to be placed on site, the test result is greatly affected by the environment. Complete sampling, as a traditional gas monitoring method, needs to be monitored through a series of processes when measuring the gas. However, as the whole process of this method requires heat preservation and preheating, the system is relatively complex, expensive and limited to be used.

4.2 Development of new technologies for monitoring air pollution

4.2.1 Unmanned aerial vehicle

For unmanned aerial vehicle, it has a high resolution in the process of use which can supervise the abnormal operation of air pollution control facilities, excessive smoke emission and projects under construction. However, application is also required when unmanned aerial vehicle is flying and it is also affected by certain meteorological conditions.

4.2.2 Grid monitoring

Grid monitoring can be used to set points of different grids so that flexible monitoring can be carried out according to the regulatory figures and regions which can effectively carry out the research on pollutant traceability prevention and monitoring and realize the fine management. This method plays an important role in the emission reduction of PM_{2.5} pollutants.

4.2.3 Lidar monitoring

The lidar monitoring system can monitor the characteristics of industrial smoke emission and complete the fixed-point detection according to the monitoring task. Lidar can not only be independently networked, but also organically linked with the monitoring network. However, for lidar monitoring, it will be interfered by weather and visibility which has certain limitations.

4.2.4 Other new technologies

Because of the fast response and strong anti-interference ability, portable instrument detection can well meet the needs of emergency monitoring and on-site inspection. With the development of new technologies, it has been possible to quantitatively monitor many emissions and it also has huge potential in actual operation and use. In addition, there are many diversified fusion methods based on information technology. These methods can help optimize the on-site data, images and videos and send them back in time, promote the implementation of law enforcement standards and carry out all-weather monitoring so as to judge whether there is pollution and abnormal emissions.

5. EFFECT OF ENVIRONMENTAL MONITORING ON AIR POLLUTION CONTROL

5.1 Strengthen scientific management of air pollution

By monitoring the environment, the pollution information and data can be understood in real time which can provide some scientific basis for the prevention and control of air pollution in the future. For the scientific nature of air pollution control, it is necessary not only to improve the efficiency of the work, but also to scientifically manage the large amount of information and data acquired in environmental monitoring. However, due to the different development conditions in different regions in China, the situation of air pollution in each region is also quite different. Therefore, it is necessary for each region to strengthen real-time data monitoring and make scientific analysis of the previous data so as to provide theoretical basis for the control of air pollution.

5.2 Important basis for handling pollution accidents

At present, there are more and more accidents caused by air pollution. With the help of environmental monitoring, it can provide important basis for the treatment of related problems. In the course of air pollution inspection and monitoring by the pollutant discharging unit, if the enterprise has a pollution accident or pollution dispute, the enterprise can be investigated for the corresponding legal responsibility with the help of the existing data and files. Enterprises that discharge air pollution in excess of the emission standards shall be punished in accordance with laws and regulations and the punishment shall be intensified punishment in due course so as to effectively urge the polluters to make rectification to reach the emission standards. Using monitoring data for effective supervision and management is an important means to solve the problem of air pollution.

5.3 Provide a basis for law enforcement supervision

The extensive development of environmental monitoring can not only monitor the air pollution in this area in real time, but also comprehensively understand the causes of air pollution problems and master the main pollutants causing pollution and the distribution areas of pollution problems. By obtaining detailed data through environmental monitoring and conducting scientific analysis can determine the source of air pollution and provide important data support for environmental law enforcement. Therefore, as an important prerequisite of

law enforcement supervision, environmental monitoring is of great significance to ensure the smooth implementation of law enforcement supervision [1].

6. MEASURES TO STRENGTHEN ENVIRONMENTAL MONITORING

6.1 Improve the environmental supervision and management system and improve the quality of environmental supervision

In the management of environmental monitoring quality, in order to effectively improve the level of monitoring, it is also necessary to do a good job in all aspects of the work. For this reason, environmental monitoring stations have been set up in all regions of our country. For the staff of environmental monitoring stations, they should not only actively complete their own work, but also pay attention to the management of environmental monitoring quality. At the same time, the environmental protection departments should also strengthen the management of environmental monitoring and arouse the initiative of environmental monitoring staff. The entire process of environmental monitoring must be conducted in accordance with various monitoring norms and standards. For department leaders, they also need to pay more attention to this work. The various processes of environmental monitoring must not be ignored and environmental monitoring must not only be carried out in terms of policies and forms. Each work should be completed step by step according to the norms and standards.

In the process of environmental monitoring, it is necessary to establish a sound environmental monitoring quality assurance system in combination with actual work in order to effectively improve the management level of environmental monitoring quality. Therefore, corresponding job positions should be set according to national standards and relevant management regulations and job responsibilities and norms should be clarified so that all staff can carry out their own work efficiently and orderly so as to ensure all work can meet the qualified standards. In the process of environmental monitoring, it is also necessary to implement in accordance with the relevant national document standards to ensure the gradual progress of each link and improve the management level of environmental monitoring quality so that the environmental monitoring work can proceed smoothly. And at the same time, organize staff reasonably so as to improve the operating efficiency of the system.

6.2 Enrich the control index of air pollution

Control index mainly includes unit product emission, emission concentration and emission rate, etc. The pollutant discharge index of enterprises reflects the fairness of pollutant discharge among similar enterprises. However,

due to the number of products involved, it is difficult to implement in some industries. But for enterprises with relatively stable production, most of them are feasible. At the same time, the standards for the emission of air pollutants should also be based on the characteristics of the industry and control index and indicators should be used individually or in combination to achieve the best control effect.

6.3 Strengthen regional air pollutant emission standards

For the environment, there are some national standards. In a certain period of time, the national average control level is the most basic control level. However, local environmental standards should be formulated according to the actual needs of local economy, technology and management levels and regional characteristics. The requirements of environmental standards in different places are different, but they can not be lower than the national standards. National standards can only reflect the industry differences in environmental requirements, but not the regional differences of environmental requirements. However local environmental standards can be well reflected. The powerful pertinence and operability of local environmental standards can make up for the deficiency of national environmental standards construction and better promote the improvement of local environmental quality.

6.4 Increase the construction of environmental monitoring data platform

In the era of information big data, China's information technology is also developing rapidly and big data platform has been widely used. Speeding up the construction of big data platforms for environmental monitoring can also provide help in solving the problem of air pollution. However, in the process of actual operation, the degree of information sharing is low, monitoring and supervision are not effectively combined and the quality of monitoring data can not be guaranteed. Therefore, it is necessary for environmental supervision departments to speed up the construction of big data platform for environmental monitoring. They should not only improve the quality of the environment monitoring but also actively expand effective ways of data monitoring.

During the construction of the big data platform, it is necessary to establish a relatively complete atmospheric environment monitoring network nationwide. It not only requires the collection, transmission and collection of atmospheric environment monitoring data in various regions of the country, but also requires the later management and information sharing of the data. At the same time, the monitoring data need to be deeply mined and applied and the integration of various factors in environmental monitoring should be strengthened. In addition, local governments can also vigorously promote

the development of relevant environmental monitoring work and promote the establishment and use of big data platforms through some relevant incentive policies.

6.5 Improve the professional skills and comprehensive quality of the staff

In order to better improve the management level of environmental monitoring quality, it is necessary to increase the training and education of professional and technical personnel and constantly improve their own professional level so as to meet the needs of practical work. In the management of professional and technical personnel, it is necessary to strengthen the training of political theory and professional skills in combination with the actual situation so that all staff can actively learn advanced monitoring and management technology, improve their comprehensive quality and strengthen the awareness of the importance of their own work. Therefore, ideological education should be strengthened in the formal training of staff so that they have a high sense of responsibility and work consciousness. Actively organizing environmental monitoring staff to learn more knowledge, continuously improving their comprehensive capabilities, enhancing their work enthusiasm through the incentive system and continuously improving their own work quality will inevitably promote the development of our country's environmental monitoring.

With the development of the times, in addition to the above methods, it is also necessary to invest in and use more domestic and international advanced, high-level and high-precision instruments, train high-level operation and maintenance staff and fully perform daily management and maintenance work to ensure the normal use of equipment so as to effectively improve the quality of environmental monitoring management.

7. CONCLUSION

In the process of air pollution monitoring, it is also necessary to solve relevant problems according to the local actual conditions and carry out relevant methods according to these problems so as to make environmental pollution monitoring effective. At the same time, there is also a need for coordination among various departments to speed up the construction of relevant monitoring systems and establish and improve a diversified environmental protection system. It is also necessary to carry out some environmental protection publicity work which is also conducive to the smooth progress of environmental testing.

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