

12.2 Atmospheric Environment Monitoring System

12.2.1 Overview

According to Article 22 of the Air Pollution Control Law, continuous monitoring of air pollution conditions is the responsibility of the local government. The local government bodies maintain and operate continuous air pollution monitoring systems with the aim of getting a grasp on the conditions of environmental atmospheric pollution and promoting measures to control air pollution.

The concrete aims in monitoring air pollution are: (1) for the local government bodies to get a grasp on pollution conditions throughout their regions, make the enforcement of the emergency measures provided for in Article 23 of the Air Pollution Control Law run more smoothly, be of more help in judging the suitability of environmental standards and be able to apply this to judging the necessity of strengthening regulation effects and regulation standards, and (2) to promote the environmental impact assessment system, to set regional pollution control plans and total volume emissions reductions and apply knowledge about environmental data.

12.2.2 Information Flow in the Atmospheric Environment Monitoring System

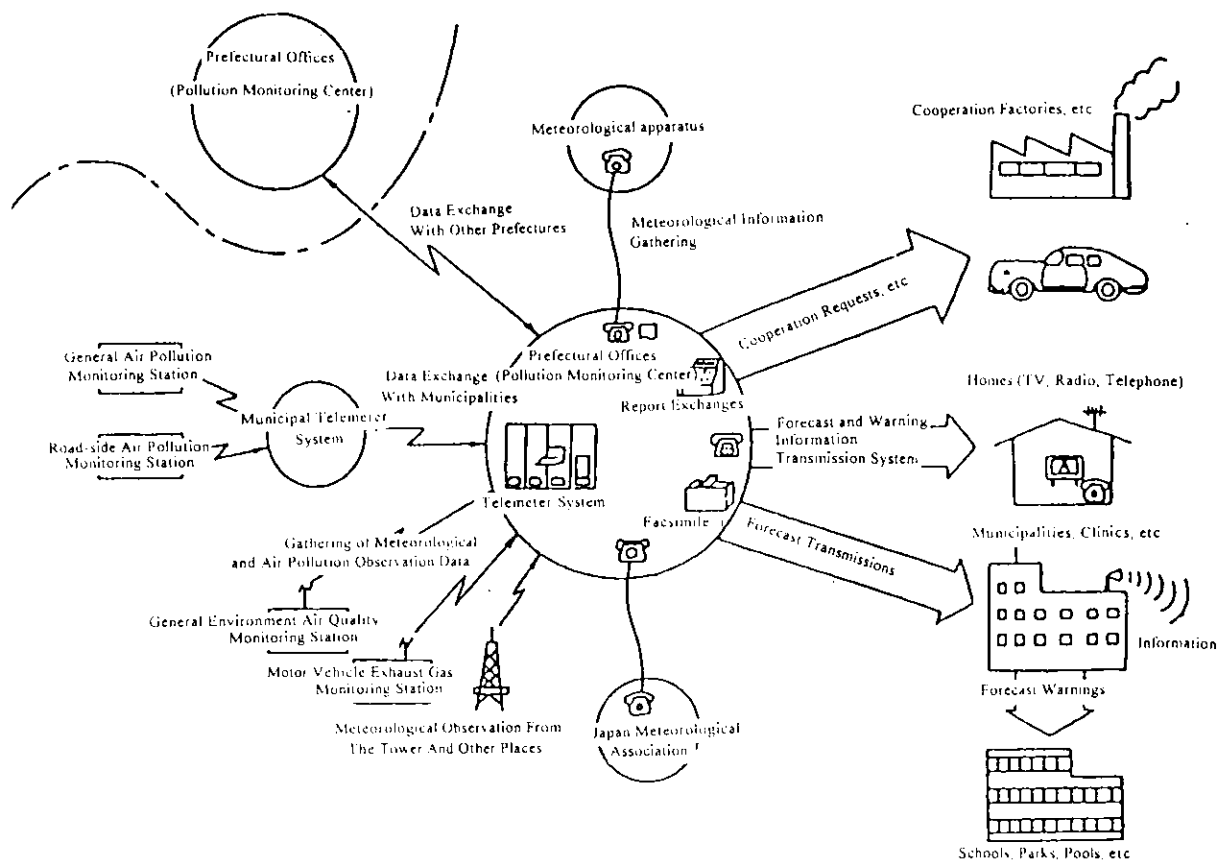
The information flow in the atmospheric environment monitoring system is laid out in Fig.12.2.1.

In this way, with the telemeter system, the measurement result data on the concentrations of air pollutants and meteorological elements is sent in real time to the monitoring centers run and operated by the local government bodies, there managed by computers and then dispatched to the nearby local government bodies where it is used for emergency measures. The telemeter system is also set up to exchange data with the meteorological agency.

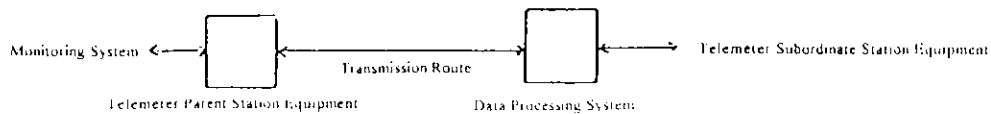
12.2.3 Atmospheric Environment Monitoring System Applications

(1) Environmental Quality Standards and Data Evaluation

Whenever measurement figures which are judged to indicate a condition of abnormality exist after the actual air pollution conditions and hourly fluctuations in concentration levels in the area being monitored are considered, the maintenance and control of the air pollution measuring apparatus, meteorological conditions and the conditions of air pollution sources are examined carefully. In this case, if it is recognized that the abnormal measurement figures exist as a result of a malfunction in the maintenance and operation of the measuring apparatus and that the regional air pollution conditions are not being accurately reflected in the apparatus, then the measurement figures are of course excluded from the figures to be assessed. Further, whenever evaluations are made on a daily basis, the average hourly measurement data are excluded from the figures to be evaluated if they are the lack of a period of over 4 hours in a 24-hour period. Also, in long-term assessments, data from the monitoring stations which do not add up to a 6,000-hour period per year is excluded from the evaluation. Environmental quality standards necessary for both short-term and long-term evaluations are listed in Table 12.2.1.



The Information Flow in the Atmospheric Environment Continuous Monitoring System



The Data Transmission System Diagram

Fig.12.2.1 The Information Flow and the Data Transmission System Diagram in the Atmospheric Environment Continuous Monitoring System

Table 12.2.1 Short-Term and Long-Term Evaluations for Environmental Quality Standards

Substances	Short-Term Evaluation (evaluations compared to the below environmental standards)	Long-Term Assessment
Sulfur Dioxide	One-hour mean value for a day should be 0.04 ppm or less, and one hour value should be 0.1 ppm or less	Evaluated by removing 2% from the highest daily average value However, when there are two days or more when the environmental standard is exceeded consecutively, it will be regarded as non conformity.
Nitrogen Dioxide	One-hour mean value for a day should be within the zone between 0.04 ppm and 0.06 ppm or less	Evaluated by removing 98% from the lowest daily average value However, when there are two days or more when the environmental standard is exceeded consecutively, it will be regarded as non conformity.
Carbon Monoxide	One-hour mean value for a day should be 10 ppm or less, and one-hour mean value for 8-hour should be 20 ppm or less	Same as SO ₂
Suspended Particulate Matter	One-hour mean value for a day should be 0.10 mg/m ³ or less and one hour value should be 0.20 mg/m ³ or less	Same as SO ₂
Photochemical Oxidants	One hour value should be 0.06 ppm or less	None

(2) Measures for Coping with Air Pollution Emergencies

Whenever there is a marked increase in air pollution or any danger that human health or living environment may be adversely affected, or whenever any condition arises that has been provided for by Cabinet Order, Article 23 of the Air Pollution Control Law provides that prefectural governors must inform the general public of the actual conditions and ask for the cooperation of smoke and soot emitting facilities or motor vehicle operators and drivers to reduce smoke and soot emissions and/or exercise independent restraint in operating motor vehicles. Furthermore, whenever pollution worsens and a situation of grave emergency, which is defined in Article 23 of the Air Pollution Control Law, that same law allows the local governments to order necessary measures for the reduction of smoke and soot concentrations in the atmosphere and for the restricted operation of smoke and soot emitting facilities. Penal regulations are also provided for in the case of violations of these orders. Conditions for the official announcement of such states of emergency are set down in Table 12.2.2, and the atmospheric environment monitoring system is also utilized in these official announcements. Furthermore, in such cases of emergency, the technological contents like the scale, reductions, and changes in operation of smoke and soot emitting facilities need to be examined and practical agreements need to be reached.

Table 12.2.2 Air Pollution Emergency Conditions

Substances	General Emergencies	Critical Emergencies
Sulfur Oxides	Over 0.2 ppm for 3 continuous hours Over 0.3 ppm for 2 continuous hours, Over 0.5 ppm, 48-hour average value of over 0.15 ppm	0.5 ppm for 3 continuous hours 0.7 ppm for 2 continuous hours
Suspended Particulate Matter	2 mg/m ³ for 2 continuous hours	3 mg/m ³ for 3 continuous hours
Carbon Monoxide	Over 30 ppm	Over 50 ppm
Nitrogen Dioxide	Over 0.5 ppm	Over 1 ppm
Oxidants	Over 0.12 ppm	Over 0.4 ppm

(All measurement values are based on hourly units)

(3) Other Applications

Data from the air pollution monitoring system is important in judging the effects of reductions in the emissions of pollutants provided for in emission source regulations. In other words, it is an important issue for the administrative judgment to compare air pollution monitoring system data with the environmental quality standards it aims for and apply this to judging the necessity of strengthening regulations on the air pollutant emission levels of emission sources to ascertain the advisability of attaining such standard values.

Also, highly reliable, long-term atmospheric environment data is essential for implementing environmental impact assessment. In other words, the local governments can, based on this principle data, consider the increases in air pollutant emission levels which accompany new development projects and, by estimating their effect on the atmospheric environment, evaluate such new development projects and examine measures to cope with them.

In establishing pollution control programs, based on current air pollution monitoring data, the local governments consider the new factories, development areas, and roads planned for the region and plans necessary measures based on estimates of the air pollution conditions of the area in the future. The diffusion simulation model making is necessary for arriving at such estimates, but air pollution monitoring data is also essential because the calculated values need to compare with actual measurement values.