Chapter 6 Environmental Preservation Plan

6.1 Preface

The JICA Study Team has examined in Article **5.4** the application plan of local emission standards of thermal power plants, and in this Chapter examines and recommends environmental preservation plans. The recommendations given in this Chapter are composed of environmental management and supervision of thermal power plants, fortification of ENRE's Environmental Department and general environmental policies of national and local governments in order to preserve the environment (mainly air quality) of the whole country including the areas surrounding thermal power plants.

6.2 Environmental Management and Supervision of Thermal Power Plants

6.2.1 Basic Conditions

Thermal power plants have to preserve their surrounding environments by legal and voluntary obligations. The legal obligations are to observe the legislation issued by the national and local governments where the power plants are located. The national regulations include those issued by the Secretary of Energy and ENRE.

The basic objectives and issues for the preservation of the environment by thermal power plants, in stages from their planning through construction to operation, are indicated in the Environmental Management Manual attached to the Resolution registered by the Secretary of Energy and Mines (#1) (SE Manual). The regulation is summarized in Table 4.5.1 of Chapter 4.

The Secretary of Energy and ENRE have implemented the SE Manual by preparation of various environmental preservation resolutions. In this Chapter, the JICA Team will investigate the remaining tasks in the environmental supervision and management of power plants during planning, construction, and operation stages.

6.2.2 Environmental Management and Supervision in Planning, Construction, and Operation

1) Planning Stage

Power plant entrepreneurs have to carry out environmental impact assessments and prepare environmental management and monitoring (pollution sources and environments) plans as part of their environmental management tasks. The Secretary of Energy or ENRE has to approve EIA and the plans if they meet the requirements of the laws and resolutions.

2) Construction Stage

Power plant entrepreneurs have to monitor pollution sources and environments during the construction stage. They also have to test performances of the monitoring analyzers for the operational stages. ENRE has to inspect conformance with the laws, confirm installation of pollution countermeasures and monitoring analyzers as planned, and check performances of the analyzers.

3) Operational Stage

Power plant entrepreneurs have to keep the monitoring analyzer operating normally by performing regular maintenance and inspections. ENRE has to supervise environmental management reported by the entrepreneurs following the plans approved by the Secretary of Energy or ENRE during the planning stage.

6.2.3 Recommendations during Planning Stage

1) Methodology of Environment Air Impact Assessment

A Prediction Methods

The JICA Team makes the following recommendations to ENRE on its EIA manual on environment air (#8) (ENRE Manual):

a) Hourly background concentrations should be monitored for one year.
b) Although the ENRE Manual has requested that entrepreneurs report how they have decided the background concentrations and results of diffusion calculation, the JICA Team found many EIA reports did not describe these things. The entrepreneurs should be required to observe the manual strictly.
c) Step II in the EIA manual requests the compilation of 5 years' hourly meteorological data. The JICA Team feels the recent one year of data is enough for the purpose. However, the year should be checked to ensure that it was not an abnormal year with the data at the nearest meteorological observatory.
d) Many models given by US-EPA do not reflect on calm conditions. Where there are high frequency of calm conditions, other appropriate models should be applied.
e) The calculation method of the mixing height given in the manual is not practical. It is better to calculate the height from observation of vertical temperature profiles. If the profiles are not observed or the data are not available, the mixing height should be set at infinity.

B Study on Current Environment

ENRE Manual states that number of monitoring sites shall be three, supposedly having following concentrations:

a) the maximum impact concentration from a power plant to be installed newly or extendedly,
b) the maximum concentration from other sources than the power plant, and
c) the maximum concentration by the combined effect of the power plant and other sources.

The JICA Team recommends to ENRE that power plant entrepreneurs should monitor at least one site with automated continuous analyzers to know the conformity with the ambient air quality standards for EIA, if there is no reliable data in the area.

The monitoring period at the three sites will be for one year if one concentration of three pollutants (SO_2, NOx, SPM) is supposed to exceed 50% of its ambient air quality standard. If it is not, six months (3 for summer and 3 for winter) will be enough for monitoring considering variation of meteorology and emission sources.

Also at least one site should observe meteorology (wind direction, wind velocity and temperature) together with three pollutant concentrations.

Power plant entrepreneurs are expected, prior to monitoring, to consult with the local government and ENRE (or the Secretary of Energy) for the site selection of monitoring, monitoring methods, frequency and period.

C Prediction of Future Background Concentration

ENRE Manual states that future air quality shall be evaluated in comparison with the valid air quality standards and the sum of impact and current background concentrations. The manual also states entrepreneurs should decide future background concentration in discussion with the competent local government.

Entrepreneurs can obtain current background concentrations from air quality monitoring. However, they have difficulty predicting future background concentrations by themselves, because of lack of information on future local development plans, development of other emission sources, etc. The local government should usually possess these kinds of information.

The following is a recommendation of the JICA Team in this matter. Namely, ENRE shall ask the local government to instruct the future background concentration to the said entrepreneur, or have an agreement with the local government about its instruction on the prediction method and its presentation of the local information to the entrepreneur.

D Obligatory Confirmation of EIA Study

When Central Costanera and Nuevo Puerto Power Plants had completed their extended installation in the relatively polluted City of Buenos Aires, both plants carried out confirmation studies of the EIA done in the planning stage. The confirmation study is for the plant entrepreneur to report to ENRE (the Secretary of Energy) and the said local government the results of air quality monitoring and meteorology observation on the same sites with the same methods and frequencies.

The JICA Team recommends that ENRE shall include this confirmation study as one of the entrepreneurs' obligations in order to evaluate the adequacy of the prediction methods and their results of the EIA studies in the planning stage.

2) Procedures of Environmental Impact Assessment

A Public Hearing

Public hearings on EIA are held only for projects of new installation of thermal power plants, and not for extension projects. The JICA Team recommends that ENRE opens the hearings also for the extension projects, because the projects involve expansion and reclamation of land similar to the new installation projects. Also, as 8 provinces do not legalize the assessment system, ENRE has to decide to open the hearing after ascertaining intentions of local governments and the public. People in the 8 provinces should be equal to those in other 15 provinces and the City of Buenos Aires.

Combined cycles with natural gas are environmentally benign generation systems. The public hearings upon requests of local governments (province and municipalities) will propagate understandings on power generation in the public.

B Information to the Public

ENRE does not present information of EIA on extension projects of thermal power plants to the public and entrusts the presentation to provinces and municipalities. The JICA Team recommends that ENRE urge the provinces and municipalities that do not have the assessment system, to open the EIA information to the public.

C Cooperation with Local Governments

Entrepreneurs of newly or extendedly installed thermal power plants have to present EIA reports to the Secretary of Energy (new) or ENRE (extended) for judgment.

Local governments (provinces or municipalities) possess local information on environment, development, industries and socio-economical aspects. Therefore, the JICA Team recommends ENRE to establish a cooperation system between entrepreneurs, ENRE

and the local governments for discussion prior to carry out the EIA study. Accordingly, the entrepreneurs can obtain valuable information from the local governments for smooth and effective EIA studies.

The JICA Team recommends that ENRE (the Secretary of Energy) build up tight cooperation with local governments for EIA of thermal power plants. Presently, ENRE is negotiating with the Province of Buenos Aires for cooperation in the assessment to give consultation and information to entrepreneurs and to evaluate the EIA results. Also ENRE has already judged EIAs on extension projects of thermal power plants in the Province of Mendoza as a sectional evaluator.

D Reports

It is recommendable for an entrepreneur to present the same EIA report to ENRE, the appropriate province and municipality. The entrepreneur has to observe all laws, resolutions and ordinances of the nation, the province and the municipality. And these official organizations have to review on the same basis. In return, this procedure will reduce burdens of the entrepreneur and help him to carry out the assessment study efficiently.

E Obligations of Entrepreneurs

The JICA Team recommends to ENRE that entrepreneurs are obligated to consult with ENRE (the Secretary of Energy), the local province, and the local municipality for items, methods, contents of reports, etc. of the environmental assessment prior to its study commencement. And also ENRE should make entrepreneurs present the same report to each official agency. These obligations are exerted to the EIA confirmation study after commencement of the commercial operation.

6.2.4 Recommendations during Construction

1) Environmental Preservation

The construction stage may be divided into land reclamation, foundation and installation of facilities, and test operation. Large impacts on the surrounding environment may arise by reclamation, transportation of surplus soil, materials and equipment, civil work, etc., although some are only temporary.

The JICA Team recommends that ENRE (the Secretary of Energy) direct the construction work for preservation of the environment positively. This will contribute to revision and improvement of ENRE's future performance on related work with EIA.

2) Environmental Control Unit

The JICA Team recommends that ENRE check whether the planned environmental control units are installed as designed. Stoppage and repair of the plant after the commencement of commercial operation are troublesome socially and economically. ENRE should have a right to order modifications to the control units if the units are not in meeting with the original design.

3) Supervision of Analyzer's Performances

ENRE's supervision is mandatory during the construction and test operation stages in order to secure normal performances of monitoring analyzers during the commercial operation. The JICA Team recommends that ENRE organize an inspection team in its organization for the test operation. The inspection team should have the mandates to confirm the monitoring analyzer's and the plant's performances whether the performances are in meeting with the design. It has to witness the normality of analyzers' and other related equipment's movements, of analytical performance, and of recording during the test operation. This new organization may be able to witness performances of analyzers during commercial operation regularly and will enable ENRE in the future to receive environmental data taken with the analyzers witnessed and approved by ENRE.

It is especially important to check the test results of automated stack gas monitoring analyzer because it is very sensitive. Entrepreneurs will be better off by asking outside capable organizations such as CNEA for calibrations and functional tests of the analyzer for monitoring stack gases and ambient air qualities.

6.2.5 Recommendations during Operational Stage

1) Stack Gas Monitoring

Stack gases emitted from the following generation systems are monitored according to the Resolutions (#36, 174) with manual methods using portable analyzers in Argentina. Those systems are a) all of gas burning steam turbines, b) lower than 75WM of solid and liquid fuel burning steam turbines, and c) all gas turbines, and combined cycles (except bigger than 250 MW with liquid fuel additional burning heat recovery boilers).

Reliable private or official agencies such as CNEA have been calibrating portable analyzers possessed by power plants or outside laboratories every three months. Reportedly, as a result, the accuracy of the monitoring has been greatly improved.

Stack gases from generation systems having more than 75 MW with solid or liquid fuel steam turbines and bigger than 250 MW of combined cycles with liquid fuel additional burning heat recovery boilers are monitored with continuous automated analyzers, according

to the Resolutions (#36, 174). The performances of these continuous analyzers are checked and adjusted by CNEA with its portable analyzers upon request of ENRE. However, the request of ENRE is not frequent.

The JICA Team recommends to ENRE that the continuous automated analyzers have to be maintained, checked and calibrated regularly in consideration of the importance to air quality by emissions from large thermal power plants. Table 6.2.1 is the example of frequency for maintenance of the analyzers.

Table 6.2.1 Example Frequency of Stack Gas Automated Analyzers' Maintenance

Maintenance	Frequency
Automated calibration (Zero and span)	Daily or once in three days
Manual calibration (Zero and span)	Monthly
Indication check with manual analyzers	Once in three months
Checking of movement, flow rate, etc.	Monthly
Overhaul	Yearly
Change of filters	As needed

Thermal power plants have to report to ENRE the periods and reasons of the excess emissions over the emission standards. The JICA Team found many instances of exceeding or abnormal data in the reports of hourly averages presented by the target power plants.

The JICA Team recommends that ENRE establish rules to judge whether the data are exceeding, abnormal, or correct by reviewing the data of the continuous automated analyzers, and also to establish rules to maintain and manage the analyzer to produce accurate data continuously. Power plants having the continuous automated monitoring analyzers should establish appropriate organizations to observe the ENRE's rules. Table 6.2.2 summarizes items for confirmation of stack gas monitored data.

Table 6.2.2 Confirmation of Stack Gas Monitored Data

Item	Description
Daily confirmation	Operators have to judge the data in comparison with emission standards, plant operational conditions, past experiences, etc. When they found the data exceeding or abnormal, they have to record the plant operating conditions, maintenance and performance conditions of the analyzer.
Abnormal data check	If the analyzer is not working correctly even after the maintenance or correction, it shall be treated as "lack of data".
Reasons of Abnormality	Supervisors shall try to find the reasons of the abnormality.
Modification of data	The confirmed abnormal data may be treated as "lack of data" or "revised data". A list of these data shall be prepared to record the reasons.

2) Ambient Air Monitoring

There was no regular ambient air monitoring carried out to confirm environmental management of Central Costanera and Nuevo Puerto power plants, after the one carried out to check the EIA's adequacy upon commencement of the extended installation in the power plants.

Basically, the ambient air monitoring has to be carried out by a local government. The JICA Team recommends to ENRE (the Secretary of Energy) that a power plant should carry out the air quality monitoring if the said local government is not doing it, or is doing it on inappropriate sites for showing the effects of the stack gas from the power plant. The SE Manual has correctly mentioned the importance of the ambient air quality monitoring in its manual (#1) together with the emission monitoring.

Any one concentration of SO_2, NOx, or SPM may show more than 50% of the valid ambient air quality standards (Screening Level of ENRE Manual) at one or more of the 3 sites described in the ENRE Manual (refer to Item 1) B of Article 6.2.3). Or there is no suitable continuous automated monitoring by other agency to know the impact of the thermal power plant on the ambient air. In the cases mentioned above, the JICA Team recommends that ENRE let the power plant monitor at more than one sites (including the site indicating the maximum impact of emissions from the power plant) regularly (for example, once in three years) and report the results to ENRE, the provincial and municipal governments.

Continuous automated analyzers should be mobilized to check the conformity with the air quality standards. Monitored items are SO_2, NOx, and SPM, and wind direction and velocity, and temperature shall be observed at least at one site of those of ambient air monitoring.

The monitoring period will be one year in the cases where one of the pollutant concentrations is 75% or more of the standards, or six months in the case that the concentration is 50 to 75% of the standards.

The entrepreneur, ENRE and the local government have to cooperatively decide the details of the ambient air monitoring.

The JICA team recommends that ENRE and the Secretary of Energy and Mines should persuade local governments to monitor their own air qualities and meteorology.

3) Meteorology Observation

Some power plants are observing meteorology in their own sites. The JICA Team recommends that all power plants to do the same. The observed data is required for trouble-

shooting such as requests from citizens to estimate the direction, diffusion width, and level of pollution, and also for the assessment study of a planned extension project in the future.

4) Analyzer's Accuracy Control

It is mandatory to inspect and maintain monitoring analyzers to obtain reliable measured data of air qualities and meteorology. Reliable agents are needed to do this work.

JICA brought the second set of automated continuous analyzers used in this Study to Argentina. CNEA has become well familiarized with the analyzers. The JICA Team recommends that ENRE establish a system to have reliable agents inspect and maintain analyzers and to prepare a manual for the work of inspection, maintenance and calibration.

5) Presentation of Information by Entrepreneurs

The SE Manual states that the entrepreneur have to cooperate with the said local government to preserve the surrounding environment during operation and to talk with the local citizens by presenting information possessed by the entrepreneur.

It is desirable for power plants to present their information and data to local governments and to answer, without any reservation, questions from local citizens on environmental issues.

6.2.6 Entrepreneurs' Communication with Locals

The manual of the Secretary of Energy (#1) states that entrepreneurs have to cooperate with local governments to preserve environments from the planning to the operation stages, and to present information to and communicate with local citizens. It is desirable that all the entrepreneurs of power plants cooperate with local governments and publicize their information and data without reservation, by observing the manual.

There are tendencies in the power plants of Argentina to obtain ISO 14001 and to establish volunteered environmental preservation plans and open the information and data on the environmental matters to the citizens.

Combined cycle systems with natural gas as fuel are now prevailing in the power generation and are environmentally benign. The presentation of information to local governments and citizens without reservation will spread understanding of the power generation, make new and extended installation easy, and help them trust the power industry.

6.3 Fortification of ENRE's Environmental Department

6.3.1 ENRE's Environmental Department

1) Reinforcement of Technical Staff for Current Work

It has been 8 years since the department was installed in 1994. Two members are in the technical staff. They seem to have difficulty handling the routine work, such as environmental management plans and progress reports, because of the many construction projects of combined cycle systems in these few years.

Many more additional installations of new and extended power plants are scheduled in order to meet the increased demand for electric power. Accordingly, the department has to handle a heavier routine work load. The JICA Team recommends that ENRE add at least one more engineer to the staff. The department may be able to check emission data in the reports presented by power plants and evaluate their conformity with the emission standards.

As major power plants are relatively new facilities in Argentina, reportedly there has not been a serious environmental problem caused by an accident at a power plant fortunately until now. However, there is no guarantee that such accident will not happen in the future. One additional engineering staff would help in dealing with such unexpected problems.

2) Strengthening for Future Work

Power plants will be brought into commercial operation after the stages of construction and test operation. The JICA Team recommends that ENRE have one engineer to occasionally check and inspect the plants in these stages for pollution countermeasure apparatuses and monitoring analyzers. It is quite difficult to revise them as designed and authorized, because of time (to satisfy the demand) and money. Therefore, ENRE's occasional visits during construction, installation and test operation stages are very important to check that the plant and its apparatuses are being fabricated and installed as designed. This engineer can supervise environmental affairs in these stages too.

3) Development of Human Capacity

Currently ENRE's environmental department has two talented engineers: one having long experience with power generation and the other with water pollution.

Argentina will become more polluted with the progress of economy, and people will be more educated and request for more information and better environment.

Power plants are no exception. Environmental management in power plants should be improved according to the requests of people in both quality and quantity. Technologies for power generators, pollution countermeasures, monitoring, and dispersion simulations are

continuously progressing. The qualities and methodologies of ENRE's supervision should be improved to meet the social and industrial changes.

The JICA Team recommends that ENRE's environmental department should plan to develop its human capacities and its organization as a whole by the collection of related information, international cooperation, education and study, exchanges with field engineers, interdisciplinary communications, etc.

6.3.2 Technical Cooperation with CNEA

CNEA has been in charge of stack gas monitoring and calibration of related analyzers from the technical cooperation agreement concluded with ENRE in 1994. In the future, power plants will start ambient air quality monitoring with continuous automated analyzers. The JICA Team expects that CNEA will expand its capability to the continuous automated analyzers, because of its experiences with two sets of the analyzers presented by JICA for this and previous Studies.

CNEA has also developed the environment air impact assessment manual for thermal power plants (ENRE manual) and is giving scientific and technical advice to ENRE in the review process of EIAs of thermal power plants. The JICA Team expects that ENRE will deepen its cooperation with CNEA on scientific and technical fields such as air dispersion simulation and analyses of ambient air monitoring data.

6.4 General in Environmental Management

1) Air Quality Standards

There are national and local standards for air quality in Argentina. The City and the Province of Buenos Aires have their own standards and the Province of Mendoza has adopted the national standards. These national and local standards have different evaluation times that make it difficult to compare and evaluate them with each other. The JICA Team expects that a competent national agency (such as one in the Ministry of Social Development and Environment) coordinate and adjust the system of the standards within the national and local governments.

The national air quality standards appointed NOx (a mixture of NO and NO_2) as a pollutant, instead of the more poisonous NO_2. The JICA Team recommends that ENRE should propose that the Ministry of Social Development and Environment change the standard to be based on NO_2. A clean air law is under deliberation in the assembly of the City of Buenos Aires. The law of the City has selected NO_2 as the pollutant.

2) Emission Standards

Although Argentina has its national emission standards for thermal power plants, it does not have any standards for other stationary sources. In three model areas, the Municipality of Lujan de Cuyo has its own emission standards of air polluting facilities (Section 4.3.4,2) of Chapter 4). Also the City of Buenos Aires is planning to establish the local emission standards after evaluation of results of air monitoring network to be funded by the World Bank.

The JICA Team recommends that ENRE propose that appropriate organizations in the Ministry of Economy and the Ministry of Social Development and Environment establish comprehensive national emission standards of stationary sources in order to control air pollution from the stationary sources. All polluters should be equal in preserving air qualities. The local governments can have their own standards to meet their own local air qualities.

Upon establishment of local emission standards, local governments should order stationary sources to monitor and report emissions from their stacks.

There are the national emission standards of mobile sources that the local governments have adopted in their jurisdiction.

3) Environmental Impact Assessment

There is no comprehensive environmental impact assessment law in Argentina. However, there are several enterprises obligated to observe the assessment stated by the national ministries. Also, 15 provinces and the City of Buenos Aires have the assessment system. However, all these assessment systems have different procedures and contents. The JICA Team recommends that ENRE propose that the Ministry of Social Development and Environment draft the comprehensive environmental assessment law, to arrange the basic procedures and content, and to establish the uniform environmental assessment to be carried out in Argentina.

4) Ambient Air Monitoring

Within the three model areas, only the Province of Mendoza is monitoring air qualities in the greater Mendoza area. The City and the Province of Buenos Aires jointly have a plan to install an ambient air monitoring network in the metropolitan Buenos Aires area with the help of the World Bank.

Generally, air pollution is caused by many sources of social, industrial and economic activities. Therefore, air quality monitoring is the responsibility of local governments and not of individual polluters.

Comparison results of the monitored data with the air quality standards will bring understanding of the local air quality. The monitoring can generate the basic information for

the governmental environment management. From this point, the monitoring should be carried out with automated analyzers that can produce continuous data around the year.

The ambient air monitoring should be carried out with the same methods and rules in the whole area of Argentina. Therefore, standard manuals must be prepared for the selection of monitoring sites, monitoring methods and technologies, maintenance and management of analyzers, data reduction, etc. including meteorology. The JICA Team recommends that ENRE propose an appropriate official agency (one in the Ministry of Social Development and Environment) for drafting a law of monitoring by local governments and a manual on the uniform monitoring methods.

5) Source Inventory

Besides the air quality monitoring, the source inventory is the other basic information required for the governmental environment management. Local governments have to regularly compile and maintain the inventory in their jurisdictions.

The same methods and rules also have to be prepared for the source inventory in the whole of Argentina. Again the JICA Team recommends that ENRE propose an appropriate official agency (one in the Ministry of Social Development and Environment) for the preparation.

6) Initiation of Pollution Control Manager System

The pollution control manager system is an institutional measure to control pollution by a professional organization and to check factories' observance of pollution control laws and regulations. The factories specified by the law are obliged to position the pollution control managers in their pollution control organizations. The managers who have passed a national qualifying examination maintain and manage the polluting facilities and pollution control facilities, and inspect the quality of fuel and raw materials, etc.

The JICA Team recommends that ENRE propose an appropriate official agency (one in the Ministry of Economy or of Social Development and Environment) to initiate the pollution control manager system in designated factories including thermal power plants based on capacities of stack gas, waste water, or others.

7) Compilation of Socio-economic Statistics

The pollution is the product of human activities. Compilation of socio-economic statistics is necessary to know causes, severity and scales of pollution. Especially local governments have to compile local statistics in the uniform style and open them to the public.

8) Efficient Environmental Management

The national, provincial, and municipal governments, private organizations, universities,

institutions, etc. are exerting efforts to preserve environment. However, those efforts seem not to be unified and not to aim the same direction. As resources for the efforts are limited, the JICA Team recommends ENRE to propose an appropriate official agency (one in the Ministry of Social Development and Environment) to unite the efforts as much as possible to effective and efficient air pollution management.

9) Contribution of Secretary of Energy, ENRE and CNEA

Both agencies, ENRE and the Secretary of Energy, have been contributing greatly to preserve the environment cooperatively with power plants by establishing environmental management standards and rules. Both agencies have deep knowledge and many experiences of air quality preservation by establishing emission standards, stack gas monitoring methods, and EIA of power plants.

CNEA has also contributed to ENRE and the Secretary of Energy in monitoring of stack gases and air qualities and preparation of EIA manual.

The JICA Team recommends continuing this cooperation of the three agencies and spreading their knowledge, experiences and technologies for further improvement of environmental management in Argentina.

6.5 Execution of Environmental Preservation Plan

Table 6.5.1 summarizes a total of 35 recommendations described in this Chapter. The recommendations cover not only matters of the Secretary of Energy, ENRE and thermal power plants, but also of other national governments and local governments. Implementation of the recommendations depends on the future trends of air pollution, society, policies and the economy in Argentina. Therefore, the concrete implementation schedules are difficult to propose. The JICA Team has prioritized the recommendations according to their urgency and importance in Table 6.5.1.

Table 6.5.1(1) List of Recommendations for Air Quality Preservation

Note: U: urgency 1>2>3, I: importance 1>2>3

Planning Stage of New or Extended Power Plant Installation (EIA)

Item	Article	Title	Recommended Items	U			I			U	I
				3	2	1	1	2	3		
1	6.2.3, 1) A	Processes in EIA	Background concentrations, Contents of reports, Meteorology data, Consideration on frequent calm conditions, and Mixing height	■				■		3	2
2	6.2.3, 1) B	Air quality monitoring	Sites, methods, periods, and pollutants; by continuous automated analyzers	■				■		3	2
3	6.2.3, 1) C	Future background in EIA	Let local governments instruct entrepreuneurs on future background concentrations.	■			■			3	1
4	6.2.3, 1) D	Confirmation after in operation	Let entrepreneurs confirm the adequacy of their EIAs after in operation.			■	■			1	1
5	6.2.3, 2) A	Public hearings	Public hearings should also be held for the extension projects.		■			■		2	2
6	6.2.3, 2) B	Information to Public	Let local governments open EIA information to the public.		■		■			2	1
7	6.2.3, 2) C	Cooperation with local governments	Establish cooperation with local governments for EIAs of entrepreneurs.		■		■			2	1
8	6.2.3, 2) D	Reports	Let entrepreneurs present the same report to each official agency concerned.		■		■			2	1
9	6.2.3, 2) E	Obligation of entrepreneurs	Let entrepreneurs oblige to consult with ENRE and local governments for EIA before its commencement.		■		■			2	1

Construction Stage including Test Operation

Item	Article	Title	Recommended Items	U			I			U	I
				3	2	1	1	2	3		
10	6.2.4, 1)	Environmental preservation	Direct construction work to preserve environments.	■					■	3	3
11	6.2.4, 2)	Check of control units	Check the environmental control units are being installed as planned.	■				■		3	2
12	6.2.4, 3)	Check of analyzers	Check performances of monitoring analyzers, by a temporal inspection team.	■			■			3	1

Operational Stage

Item	Article	Title	Recommended Items	U			I			U	I
				3	2	1	1	2	3		
13	6.2.5, 1)	Flue gas measurement	Establish rules for inspection and maintenance of continuous automated analyzers.			■				1	1
14	6.2.5, 1)	Flue gas monitored data	Establish rules for screening continuously monitored data.			■				1	1
15	6.2.5, 2)	Air monitoring by local governments	Let local governments monitor air qualities. (see also Item 30 below)			■				1	1
16	6.2.5, 2)	Air monitoring by power plants	Let power plants monitor air qualities, if local governments are not monitoring.	■					■	3	3
17	6.2.5, 3)	Meteorology observation	Let power plants observe meteorology in their properties.		■		■			2	1
18	6.2.5, 4)	Monitoring instruments for air quality and meteorology	Establish rules and a system to control accuracy of analytical and meteorological instruments.		■		■			2	1
19	6.2.5, 5)	Open of data to the public	Let power plants open their environmental data to the public.			■				1	1
20	6.2.6	Communication with the public	Let power plants communicate with the public on environmental issues, for better understanding of power generation business.			■				1	1

Table 6.5.1(2) List of Recommendations for Air Quality Preservation

Note: U: urgency 1>2>3, I: importance 1>2>3

Fortification of ENRE Environmental Department and others

Item	Article	Title	Recommended Items	U			I			U	I
				3	2	1	1	2	3		
21	6.3.1, 1)	More engineers for the current tasks	Add one or more engineers to the department to check reports from power plants.			■	■			1	1
22	6.3.1, 2)	One for the future	Add one engineer to handle future tasks of checking at each stage of power plant installations. See also Item 12 above.			■	■			1	1
23	6.3.1, 3)	Capacity development	Plan to develop the individual and departmental capabilities for the future.			■	■			1	1
24	6.3.2	Cooperation with CNEA	Continue cooperation with CNEA who has enough experiences to check and calibrate analyzers of stack gas and air.	■			■			3	1
25	6.4, 9)	Cooperation with SE and CNEA	Continue cooperation with SE naturally and with CNEA in order to improve the environmental management in the power industry.	■			■			3	1

General in Environmental Management

Item	Article	Title	Recommended Items	U			I			U	I
				3	2	1	1	2	3		
26	6.4, 1)	Air quality standards	Let an official agency adjust the differences in the national and local standards.			■	■			1	1
27	6.4, 1)	NO_2 in the air quality standards	Propose to a competent official agency for changing NOx in the standards to NO_2.			■	■			1	1
28	6.4, 2)	Emission standards of other stationary sources	Propose to a competent official agency for setting comprehensive emission standards of stationary sources and for making entrepreneurs report stack emission analyses.			■	■			1	1
29	6.4, 3)	Comprehensive EIA system for the nation	Propose to a competent official agency for drafting the comprehensive EIA law to establish the uniform EIA system in the nation.			■	■			1	1
30	6.4, 4)	Air monitoring by local governments	A local government should monitor its air qualities. Let a competent official agency draft the law for the purpose and the manual for the uniform monitoring methods.	■			■			3	1
31	6.4, 5)	Source inventories	Propose to a competent official agency for letting local governments prepare source inventories. The agency should prepare the uniform manual for it.		■		■			2	1
32	6.4, 6)	Pollution control management system	Propose to a competent official agency for initiation of the pollution control management system in large factories including thermal power plants.		■		■			2	1
33	6.4, 7)	Socio-economic statistics	Propose to a competent official agency for compilation and publication of local statistics in the uniform style.	■				■		3	3
34	6.4, 8)	Effective environmental management	Let a competent official agency unify efforts done by various agencies to manage effectively the environmental issues by having common knowledge, information etc.		■		■			2	1
35	6.4, 9)	Technology transfer	SE, ENRE and CNEA should utilize their knowledge, technologies, etc. obtained from supervision of power plants for preserving the national environment.		■		■			2	2