

### 6.3.3 Environmental Monitoring

#### (1) Survey of Environmental Impact Assessment

The Mongolian Ministry for Nature & the Environment enacted the execution rule on the Initial Environmental Impact Assessment (IEE) (equivalent to the Japanese preparation document on the Assessment) in 1998. Moreover, “the creation rule for the environmental protection plan and the environmental surveillance plan” and “the rule on managing execution of an environmental influence detailed evaluation report (EIA)” were established at the same time.

When a great impact is expected based on examination of the IEE, a detailed EIA has to be executed in the same way as the Japanese assessment. As a different feature, the Mongolian environmental protection plan and monitoring plan include each measure’s expense documents; moreover, the survey content on the environmental sanitation work, health security and the work safety measures have to be described.

TES4 was instructed not to perform IEE for common enterprises but the EIA to be investigated by the Ministry for Nature & the Environment in 2000. Furthermore, an environment survey consulting company (SATU) was recommended. After TES4 investigated the survey content based on the rule of managing execution of the EIA, the assessment survey was conducted from June until the end of December 2001. The object of the EIA is to grasp the environmental impact of the power station itself.

The survey items carried out by TES4 are shown in Table 6.3-21.

The EIA report is to be created mainly with the following composition based on the Mongolian Environmental Conservation Law and submitted to the Ministry for Nature & the Environment in early 2002.

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| <p>(Composition of EIA report)</p> <ol style="list-style-type: none"><li>1) Substance of the enterprise (Intended clarification)</li><li>2) Survey on the law and regulations</li><li>3) Main parameter on the present condition of the natural environment</li><li>4) Range of negative influence</li><li>5) Evaluation on an accident</li><li>6) Rational plan of the enterprise</li><li>7) Main negative influence of the enterprise. Advice on its mitigation and solution</li><li>8) Protection plan for the natural environment</li><li>9) Monitoring plan for the natural environment</li><li>10) Opinion of local residents</li><li>11) Other problems on the features of the enterprise</li></ol> |
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(2) Automatic Continuous Measurement for SO<sub>2</sub>, NO of Exhaust Gas

With assistance from Germany, Sick AG (a German environmental monitoring firm) installed continuous measuring equipment (Ultraviolet absorption type) for SO<sub>2</sub> & NO at a ground height of 50-60 m in stacks in 1999 and it was in operation for about one year. This equipment has not been used since it broke down through UV lamp damage, etc.

At present, TES4 is examining how to repair the device and monitor the exhaust gas continuously. The actual measurement accuracy is indistinct, since Sick AG took the data home.

It is desirable to install a suitable device for even monitoring NO<sub>2</sub>, because there is no measurement specification for NO<sub>2</sub>.

The specification outline of the existing device is as follows:

- Type: GM31-2 (Ultraviolet adsorption type)

- Measured component:

SO<sub>2</sub>: min. 0~100 mg/m<sup>3</sup>, max. 0~12,000 mg/m<sup>3</sup>

NO: min. 0~150 mg/m<sup>3</sup>, max. 0~4,000 mg/m<sup>3</sup>

- Measuring accuracy: upper limit of  $\pm 2\%$

- Gas Temperature: up to 400°C

Table 6.3-21 Outline of the EIA Survey on TES4

<p>(Related Laws)</p> <ul style="list-style-type: none"> <li>• Investigation on regulation law, rule, manual and standard, etc. of the environmental conservation related to the power plant</li> </ul> <p>(Circumference environment)</p> <ul style="list-style-type: none"> <li>• Investigation on the present condition of weather and air quality</li> <li>• Present condition of surface water environment (the flow of surface water, water quality, flood, contamination, etc.)</li> <li>• Present condition of groundwater</li> <li>• Investigation on geological structure</li> <li>• The kind and habitation situation of animal</li> <li>• Vegetable kind and growth situation. Clarification of the destructive situation of vegetation by the artificial act, and its reproduction situation</li> <li>• Investigation on other elements of natural environment influenced easily by the enterprise of the power station</li> <li>• Investigation on the structure and ingredient of the soil, natural collapse, artificial destruction, contamination, and land use situation</li> <li>• Investigation of the influence on the archaeology, extinct organisms, historical &amp; cultural ruins in surrounding area by the power station</li> </ul> <p>(Labor health environment)</p> <ul style="list-style-type: none"> <li>• Investigation on the lighting, noise and vibration in the work place</li> <li>• Investigation on the rate of coarse particulate generating, air flow speed, humidity, temperature in the work place</li> <li>• Evaporation of chemical substances</li> <li>• Electromagnetic field in the circumference of the work place</li> <li>• Electrostatic field</li> <li>• Disease situation of employees</li> <li>• Investigation on the labor safety and damage accompanied by the accident, and situation of a labor safe protection</li> </ul> <p>(Environmental preservation measures)</p> <ul style="list-style-type: none"> <li>• Investigation on the consumption of resources such as coal and water etc., and supply rate and rational use</li> <li>• Investigation on the amount of chemicals consumption and storage situation</li> <li>• Investigation on the kind, quantity, component, feature and diffusion situation of the exhaust gas, liquid (drainage) and waster generated during operation, and those mitigation measures</li> <li>• Clarification of the economical and social contribution of the power station</li> <li>• Investigation on the local resident opinion about the power station</li> </ul> <p><u>Detailed evaluation of the influence on the natural environment</u></p> <p>After investigating the environmental protection law, rule, regulation, manual, and standard etc. related to the power station, data are collected and considered sharply to evaluation work.</p> <ul style="list-style-type: none"> <li>• Clarification of the bad influence to the natural environment and human health by the enterprise</li> <li>• Clarification of the main bad influences by the enterprise             <ol style="list-style-type: none"> <li>1) Attaching importance to the influence of exhaust gas and ashes and the influence on work place conditions.</li> <li>2) Clarification of main composition of the natural environment as object of bad influence Attaching importance to the air quality, water quality, soil and vegetation, etc.</li> <li>3) The influence area, influence level and term</li> </ol> </li> <li>• Clarification of the influence on business activity (a machine, equipment, material, technology) by the natural environmental composition</li> <li>• The bad influence on the project under operation by the natural dangerous phenomena, such as an earthquake and a thunderbolt, etc.</li> <li>• Accident investigation, damage accompanied by the accident, and clarification of its mitigation measure</li> <li>• Clarification of the rational technical measure of mitigation against influence on the natural environment by business activity</li> </ul>
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### 6.3.4 Effective Utilization

#### (1) Effective Utilization of Coal Ash

- TES4 sent two employees to China in July 2001, to survey the Chinese situation of the effective use of ash. Moreover, the power station has been conducting positive information gathering on related technology, such as taking part in an international symposium on the effective use of ash held in Taiwan, in September 2001.
- However, TES4 judges that the ash pond construction for long-term reclamation is a top priority in order to supply stable energy. Therefore, the power station intends to tackle the effective use of ash, after an optimum ash pond is secured.
- According to the result of marketing research on construction material by the Engineering Department of TES4, road material is assumed to be an object of the effective use of ash. However, since problems remain, such as the problem of the construction budget and establishment of the sales network of the product, the time schedule for the effective use of ash is undecided at present.

Domestic marketing survey by TES4

<i>Object of use</i>	<i>Demand (m<sup>3</sup>)</i>	<i>Unit price (Tug)</i>	<i>Annual consumption Amount of money (Million Tug)</i>	<i>Note</i>
Construction material, keeping warm materials, a block	250,000	22,750	5,687.5	Under investigation
Road material				
1. Road drain, ballast (Macadam, gravel)	1,600,000	5,000	8,000	(Use of natural gravel at present) Under investigation of use on the Millennium road
2. Partition material of a road	800,000	30,000	24,000	(Use of import and domestic materials at present) Under investigation of use on the Millennium road
Fireproof material,				
1. Round fireproof material	--	--	--	Under investigation
2. Light brick of a boiler inner side				
3. Heavy brick of a boiler inner side wall				

## (2) Industrial Waste

TES4 entrusts the treatment of scrapped material generated by daily repair and a scheduled inspection to a subsidiary cleaning company (Erchim Serbes Co.).

The whole amount of the waste generated (about 500 t/year) is mostly sold off to the iron-manufacturing factory in Darhan.

Scrapped materials generated at the time of Phase-I are still kept at the site of this subsidiary company and TES4 is scheduled to process them by Phase-II enforcement.

Fig. 6.3-15 shows the storage situation of the waste materials generated at Phase-I. It is necessary to perform internal treatment including recycling hereafter.

## (3) Coal Leakage

In the work of acceptance of a coal freight car and transportation from coal yard to coal bunker, coal leakage is not generated and accepted coal is used efficiently at TES4.

Therefore, reuse of coal leakage is not performed.

### 6.3.5 Recommendation for Environmental Conservation of TES4

#### (1) Ash Pond Installation for Long-term Ash Reclamation

- At present, TES4 is newly constructing the 4th ash pond, but it has small-scale capacity for urgent reclamation over 2 years.

Should ash reclamation become difficult again in the near future, plant operation should be suspended, even if the equipment for power generation has been repaired in the Phase-II stage.

Therefore, to maintain stable operation of the plant hereafter, an optimum ash pond with reclamation possible on a scale of 5 to 10 years has to be constructed.

- In considering the cost estimate of 4th ash pond (400 million yen for 2 years reclamation), the construction cost is estimated at about 1.15 billion yen for the ash pond with as same capacity as 3rd one (for 6 yearly ash reclamation).
- 4th ash pond under construction is located in distance about 1.3km from the Thor River which flows city east and west, and a vein of water pulse exists in the periphery, many puddles at the ground, respectively. Because of this, a sufficient field survey has to be carried out for site selection.
- There is no standard regarding ash pond in Mongolia at present. Accordingly, it is considered that the construction method and material use have to be based on Russia design like the 3rd ash pond.
- Furthermore, as for this construction proposal TES4 is requesting the support of Japan earnestly.

#### (2) Silencer Installation as Measure against Noise

- As reduction measure against the noise level caused by steam discharge into the air, the installation of silencer is necessary. Moreover, since the noise level in surrounding area exceeds standard value 85dB(A) at the time of steam discharge, it is desirable to install it possibly at early stage.
- As TES4 has eight boilers, detailed investigation on the installation place and number of silencer, etc. is necessary.
- Installation cost of a silencer is estimated at 7 million yen in Japan.

Fig. 6.3-16 shows the structure example of a silencer for safety valve.



Fig. 6.3-15 Storage Status of Waste Material from TES4  
(October, 2001 shooting)