

I) **UNIT PROFILE: -**

National Fertilizers Limited, **Schedule 'A' & a Mini Ratna Category-1 company**, was incorporated on 23rd August 1974 for setting up two fertilizer plants based on partial oxidation of Feed Stock Fuel oil / LSHS at Bhatinda in Punjab and Panipat in Haryana having an installed capacity of 5.11 lac tones of Urea each. When Govt. of India undertook the task of reorganization of fertilizer sector in 1978; the Nangal Unit of Fertilizer Corporation of India was merged with National Fertilizers Limited. The company received first prize for **"Excellence in project management"** from the Ministry of Programme Implementation, Govt. of India for executing the country's first inland gas-based fertilizer project of 7.26 lac tones of Urea at Vijaipur (Madhya Pradesh) on HBJ gas pipeline. Subsequently, expansion of Vijaipur plant for doubling its capacity was completed in March 1997.

Company's annual sales turnover is Rs 3654 crores & %age share of the company towards production of nitrogenous fertilizers is estimated at 17% during 2002-03.

National Fertilizers Limited is the second largest producer of nitrogenous fertilizers in the country, with installed capacity of **32.307 Lac tones** of Urea per annum

National Fertilizers Panipat.

The Government of India approved the Panipat Project on 10th February 1975 for implementation. Prime consultants for design, engineering and erection and commissioning of the

plants were M/s. Toyo Engineering Corporation of Japan and M/s. Engineers India Limited. Starting from the zero date of 30.4.1975, the feed in was achieved on 1.9.78. The unit went in commercial production from 1.9.1979.

ii) **ENERGY CONSUMPTION:**

Panipat unit consumes fuel oil, LSHS/HPS as feedstock for producing Ammonia as intermediate product and Urea as final product. It also consumes coal and furnace oil in auxiliary boilers for producing steam and generating power in captive power plant for meeting own requirement of power. In addition to captive power generation, provision for import of electricity from Haryana State Electricity Board grid has been made in the original set up of the plant. In 2002-2003, NFL Panipat unit consumed 234364.874 MT of fuel oil/LSHS/HPS as feed stock, 564819 MT of coal in captive power plant boiler and steam boilers, 42393.493 MT of fuel oil in Captive Power Plant and steam boilers and 20003 MW of purchased electricity.

The unit has made consistent efforts in reducing the consumption by different ways such as Increase in Capacity Utilization . This could be achieved by innovative management techniques, better maintenance procedures and improved operational methods. This could be achieved even though the plant is 23 years old. In spite of various constraints such as breakdowns, maintenance problems faced due to coal mills, Boiler and more no of equipments in comparison to the latest generation plants, the unit has been able to achieve energy consumption figure of 9.941 Mkal per tonne of urea in 2003- 2004.

iii) **ENERGY CONSERVATION COMMITMENT, POLICY AND SET UP:**

National fertilizers Limited, Panipat is wholly committed to conserve energy to the fullest possible extent. Unit is giving utmost importance to energy conservation by optimization of plant operation and process parameters, regular monitoring of fuel consumption, analyzing the reasons of higher consumption and eliminating bottlenecks. Since inception of the plant, unit has strived to improve the specific energy consumptions by way of devising and implementing energy conservation schemes.

Company has Energy conservation cell under the Department of Technical Services. E.C.Cell is headed by Chief Manager (Technical Services). This cell consists of one Sr. Manager, and

three Dy. Managers and one Sr. Asstt. Mgr who coordinate all matters pertaining to energy conservation. Performance of various energy conservation schemes and specific energy consumption of main product is evaluated and is discussed in fortnightly coordinating meeting where all managers including the Chief General Manager are present. The action plan required if any is prepared and is implemented.

The fertilizer sector is one of the most energy intensive units. About 85% of the total cost of urea is consumed in energy alone. Even a minor reduction in energy consumption results in increasing the profit. Hence, the policy of the organization is to reduce the energy consumption to the minimum. The new schemes are being implemented based on the techno-economic viability.

iv) **ENERGY CONSERVATION ACHIEVEMENTS:**

NFL, Panipat has implemented various energy conservation schemes successfully through in-house discussions, various suggestion schemes during 2003-2004 period. Implementation of these schemes has resulted in reduction in energy consumption as well as better process control and optimization.

- **Hot Oxygen To Gasifiers**

Proposal of supply of Hot Oxygen to Gasifiers was initiated based on Bhatinda & Nangal experience. E-6 after cooler in the discharge of Oxygen Compressor will be by-passed & hot oxygen will go to the Oxygen pre-heaters. Total savings are expected to be 1.5 Te of steam on account of reduction in heat duty & reduced pressure drop in the system. The scheme is expected to cost ~ Rs 3.0 Lac & annual gain is expected to be ~ Rs 60 Lac

- **Changeover of boiler feed water treatment**

Since inception, Boiler feed water treatment for all the boilers at Panipat unit was based on conventional chemicals i.e trisodium phosphate, hydrazine & ammonia. To improve steam quality for silica and to reduce water side corrosion, it was decided to change the boiler feed water treatment from existing inorganic base to All Volatile treatment (AVT) as it was claimed to be superior in performance. After its implementation the unit has been able to reduce amperage of polish water pumps. DM water pumps have also been stopped as DM Tanks have been bypassed after the condensate is being taken directly in polish water tanks because improvement in condensate quality. The total financial gain comes out to be around Rs 75 lacs/year

- **Reduction of hydro vector height in boilers**

The fly ash collected in the ESP hoppers along with bottom ash and ash in Economizer and APH hoppers are disposed off by vacuum through a hydro-vector system into an ash tank through a mixing vessel. There are a total of 6 ash water pumps, 3 each in SGP and CPP. Normally, two pumps in both the units are operated to maintain the desired vacuum in order to evacuate all the ash from these hoppers.

The hydro-vector system in SGP is located at a height of about 35M from the ground level while the same is at a height of about 20M in CPP. The pressure developed by the hydro-vector pumps is about 21 kg/cm²(g), to obtain the desired vacuum. Reducing the height of the hydro-vector platform in SGP by about 15 M will reduce the pressure requirement by about 1.5 kg/cm² resulting in energy savings in the pumps. The total financial gain comes out to be around Rs 21 lacs/year

v) **ENERGY CONSERVATION PLANS AND TARGET:**

Company waits with eagerness for all opportunities coming in the way to conserve the energy to largest possible extent.

Following schemes have been approved & activities are under implementation for improving the energy performance further:

- **Use of Process Gas for Gasifier Pre-Heating**

Proposal of Gasifier Pre-Heating with Process Gas is based on Nangal Experience. Presently, LPG/HSD is used for pre-heating of the gasifiers to 1100-1200 °C before firing. After firing of one gasifier Process gas is flared. Preheating of the other two gasifiers is continued till the gas is lined up to synthesis section, which takes about 10 hours.

Proposal is to use DSG for pre-heating. Scheme is expected to cost max. of Rs 5 lacs. As a result, there will be subsequent reduction in LPG / HSD consumption by 80%.

- **Modified Impellers For CT-1 Pumps**

Originally impellers were designed for High head and less flow as compared to the actual conditions.

Proposal: Provide modified impeller with actual parameters existing in the plant

Estimated investment is Rs. 30 lacs for SS material of construction. This will account for power savings of 184 KW/hr, with Financial Gain of Rs 43.7 Lac cumulative for 4 pumps & Payback of 11 months.

- **Energy Free Dryers for Instrument Air**

Existing Instrument Air system has separate blower & a heater for regeneration of the dryers.

Proposal: Utilize heat of IA compressor discharge air for regeneration.

The scheme is expected to cost ~ Rs 5.0 Lac & annual savings are expected to be Rs 4.6 Lac.

- **Electronic governor for synthesis and CO2 booster compressor**

The turbines of synthesis and booster compressor were equipped with mechanical governor.

The mechanical governors were replaced with electronic governors for fine and fast tuning of HP/LP valves. The saving on account of this comes out to be Rs 47 lacs/yr

FUTURE PLAN:

- **Revamping of ammonia /urea plants based on LNG**

i) **ENVIRONMENT AND SAFETY:**

◆ **ENVIRONMENT QUALITY**

National Fertilizers Limited, Panipat Unit is very conscious of its responsibilities in regard to Environmental control. From the very beginning, adequate steps are being taken in each Section of the Plants to combat pollution. As a result of in-built measures time-to-time up gradation and modifications of the existing system, the Unit meets the latest MINAS standards and getting the consent letters for Air and Water regularly from Haryana State Pollution Control Board.

AIR POLLUTION CONTROL MEASURES.

To control the air emissions, utmost care has been taken so that no harmful gases and dust particles are discharged into atmosphere even in case of emergency or upsets in the Plant. The details of Pollution control Measures provided in the various Sections in the Plant are given below;

1. Control of Urea emissions from Prilling tower :

A Urea Dust Recovery System has been installed at the top of Prilling Tower. The dust evolved by Prilling of Urea in Prilling towers is being scrubbed by spraying water from the spray nozzles in a header provided around the Prilling tower. The remaining dust after scrubbing operation is being retained by the foam Filters provided at the top. There are four induced draft fans provided at the top (each having a capacity of 1,80,000 NM³/hr.) These induced draft fans are sufficient to create draft so as to suck air from the dust chamber and discharge it to atmosphere. The gaseous effluents so discharged contains about 50 ppm of Urea as against standard norms of 150mg/NM³. Automatic washing of the foam filters has been installed to further improve the existing system. The liquid Urea solution so produced contains around 10-15% Urea which is being recycled to the Process for recovery.

2. Flare stack in Ammonia plant.

Proper care has been taken to ensure that no harmful gases are discharged directly into atmosphere. In case of emergency or upsets in the Plants, there is need to release the harmful gases to the atmosphere. These gases are discharged after ignition in a properly designed flare system. The height of the flare stack is kept 80 Mtrs. This height ensures a ground level concentration well within the permissible limits.

3. Stack in Sulphur recovery plant.

A Sulphur Recovery Unit for recovering Sulphur from the Clause Gas containing H₂S, coming out of Rectisol Section has been installed to eliminate the pollution problem that may be caused by Hydrogen Sulphide present in the raw gas. This not only eliminates the pollution problem but also recovers the valuable Sulphur from Claus gas. After recovery of Sulphur, the gases are burnt in an incinerator and are discharged through a 50 Mtrs. height chimney.

4. Ash collection system in steam generation plant.

An elaborate system comprising of Electrostatic Precipitator equipment is installed in the Steam Generation Plant for the removal of fly ash. Six electrostatic precipitators are provided for each of the three steam generation Units along with six rectification Units each of 60 KV. Gas flow rate per precipitator is of the order of 68M³/second having inlet dust concentration of 39.6 gms/M³. The above electrostatic precipitators in each boiler have been further revamped in the year 1992-93 by providing two fields in each of the boiler of similar capacity as stated above at an additional cost of Rs. 7.86 crores. These have been commissioned and the dust separation efficiency has been improved to more than 99.5% as against 98.5% at the specified condition of coal firing. We have also installed instruments on the Steam Generation Stack like smoke density measurement for SPM and carbon monoxide analysis. After recovery of fly ash, flue gases are discharged through a chimney of 80 Mtrs. height.

5. Ash collection system in captive power plant.

An efficient system comprising of electrostatic precipitators equipment is installed in the CPP for the removal of fly ash. Eight ESP's are provided for one boiler of CPP along with eight rectification Units each of 60 KV. Gas flow rate per precipitator is of the order of 90.2 M³/Second having dust concentration of 63.5 gms/NM³. The dust separation efficiency is more than 99.5% at specified conditions of coal firing. The present Level of emissions are below 100 mg/NM³ as against the standard norms of 350 mg/NM³. After recovery of fly ash, the flue gases are discharged through a chimney of 90 Mtrs. height. On line instruments like smoke density measurement, carbon monoxide measurement and oxygen measurement are installed for continuously monitoring of dust particles, CO and Oxygen in the flue gas. Boiler operation on line instruments are all micro process base for efficiently running the boiler.

LIQUID EFFLUENT CONTROL MEASURES.

For the treatment of liquid effluents, the Unit has a modern effluent treatment Plant. The effluents generated in various sections of the plant are conveyed to the effluent treatment plant through segregated sewers. This has been done because some of the effluents need separate specific treatment before common treatment, while others are used to meet the specific chemical requirement for the treatment of effluents in general.

WASTE WATER TREATMENT:

The effluent treatment is based on physico-chemical removal of ammonia through air stripping with subsequent biological treatment for the removal of urea through nitrification and denitrification process. Urea under favorable conditions is hydrolyzed by ureolytic group of micro organisms, which is found in abundance in the sanitary waters.

PROCESS DESCRIPTION:

The system is basically designed to handle 200M³/hr. effluent from plants bearing ammonia and urea at the maximum level of 520 and 340 mg/ltr respectively. On account of certain improvements and modifications in the system, the generated effluent is now at 100 M³/hr, having varying concentration of ammonia and urea.. The quality of treated effluent is maintained to meet the MINAS Standards. The treated effluent is used for the purpose of de-ashing of Steam Generation and Captive Power Plant.

OILY WASTE WATER

The oily waste water is generated from compressor houses in ammonia and urea plants, railway unloading site and tank farm areas. A common API oil separator located at effluent treatment plant is provided for the treatment of oily waste water. The skimmed oil collected from oil separators is collected in the tank and the decanted water is discharged suitably. The separated sludge from the oil separator is discharged by gravity into a common sludge lagoon for disposal after decanting oily waste.

UP GRADATION OF EXISTING TREATMENT PLANT.

Though the standard norms were achieved as per the directives from Pollution Board, time bound schemes were envisaged to meet stringent MINAS Standards. In order to study the performance of existing treatment plant, a contract was awarded to Engineers India Ltd. And PDIL to suggest measures to upgrade the system to meet revised MINAS limits. On the basis of the reports submitted by them and R&D work done by NFL, Panipat, the following schemes were found suitable and were subsequently implemented;

- MINAS had laid down a revised limit of nitrate content s in treated effluents as 10 ppm of nitrogen. For this we had to undertake up gradation of denitrification process, which required additional quantity of methanol. To meet this an additional line was provided from methanol tank.
- A separate RCC delay tank of 500M³ capacity has been provided for taking care of plant surges during upset conditions. The concentrated effluent is collected in the tank and after pretreatment it is fed to the treatment plant under controlled rate. The pretreatment, which involves bio-hydrolysis of urea by the addition of biomass and nutrients is carried out in this tank. This modification was executed after the encouraging results of the experiments conducted by the R&D work in Unit's Laboratory. This has reduced the load on the system significantly.
- The unit has taken care to reduce the effluent at source. A separate stainless steel tank of 180M³ capacity has been provided in urea plant for storing CFD washings, which is recycled into the process after achieving the required concentration. This has not only reduced the load on the treatment plant but also increased the nitrogen efficiency of the Urea Plant.

ENVIRONMENT MONITORING:

To ensure better pollution control, it is essential to monitor the environment regularly and to use the feedback results, timely, for corrective action. Panipat Unit has adopted strict monitoring controls to achieve stringent Pollution Board's Standards.

- **Ambient air monitoring.**
The Unit has set up three permanent Ambient Air monitoring stations near the boundary walls at an angle of 120° each from the source for monitoring the ground level concentration. These stations collect field data round the clock and based on the results corrective measures are taken in case any abnormality is observed.
- **Stack monitoring.**
To keep a close watch on the performance of the pollution control equipments provided in various plants, Iso- Kinetic stack samplers are monitoring stack emissions regularly. This ensures the level of emissions at source as well as the efficiency of the stacks. In addition to this, some of the stacks are equipped with on line analyzers like smoke density, carbon monoxide, oxygen and Sulphur dioxide.
- **Meteorological monitoring.**
For the reference of dispersion of air pollutants, a computerized based Wind Monitoring System has been installed at one of the monitoring station. The system is automatic and computes average wind speed and direction after every ten seconds. In addition to above, maximum - minimum temperature, Relative humidity and rain fall measurement equipments are installed and the data is recorded continuously.
- **Ski ten (lining) for ash ponds**
New ash ponds - 2 Nos. of 165 Acres areas were constructed in the year 1991-92 at a distance of about 7 KMs from the factory for handling boiler ash. To prevent leaching of pollutants in the sub-soil water, these ponds have been provided with ski ten (LDPE lining) at a cost of Rs. 86 lacs. The holding capacity of these ponds is for about 13 years which can be increasing the height of the dyke.
- **Ski ten (lining) for carbon ponds.**
Carbon is generated during the gasification section of the Ammonia Plant. 80% of the total Carbon produced is recycled in the process after processing through carbon recovery Plant. Remaining 20% is led to the carbon pond as carbon slurry. To prevent leaching of slurry water pollutants in the sub soil water ski ten (LDPE lining) has been provided in the ponds at a cost of Rs. 21 lacs approximately. Semi dried carbon containing 50% moisture is sold to the outside parties who are getting authorization letter from the Haryana State Pollution Control Board for safe handling, transportation, storage and uses.
- **Sub soil water monitoring:**
Sub-soil water surrounding the factory and new ash ponds is analyzed periodically to assess sub soil water quality. So far we could not find any objectionable substance in the sub-soil water.
- **Ecological balance:**
Maximum importance is given to maintain ecological balance in and around the Factory area. In order to maintain clean and healthy atmosphere, the Unit has planted more than 2.00 lacs of various types of trees in and around Factory and Township area. A dense thick green belt in the area of 1400 Sq. Mtrs. has also been provided around the Factory premises as required under Environmental Protection Act. These trees act as a natural depollutants by absorbing mild pollution and dust particles from air and helps in maintaining the ecological balance.

➤ **E.I.A study**

An Environmental Impact Assessment study was conducted by a Third Party i.e M/S Shriram Institute for Industrial Research, Delhi in the year 1991-92 and M/S PDIL, Sindri in the year 1996-97. These studies were conducted for assessing the contribution of various pollutants on quality of ambient air and sub soil water within a radius of 10 KMs area. As per the reports submitted by these Parties, no harmful effects on the environment surrounding the Factory are observed.

Our Plant is meeting the latest pollution control standards laid down by the Central and Haryana Pollution Control Boards. Since the inception of the Plant, there is no visible harmful effect of pollutants observed on the greenery surrounding the Plant and in the agricultural fields around our Factory. This was possible only with the harmonious and concerted efforts of our personnel and constant monitoring of the various stacks and effluent discharge outlets etc.

➤ **Environment management**

Management of NFL, Panipat Unit gives due consideration to monitoring the Environment and maintaining the quality of emissions discharged from its premises. The problems related to environment are reviewed in the Weekly Co-ordination meetings chaired by the General Manager and attended by all the Departmental and Sectional Heads for corrective actions besides day to day follow ups by Laboratory who is over all responsible for Environmental Management System. With the joint efforts by all Sectional Heads, the Unit is meeting all the stringent emission standards set by Haryana State Pollution Control Board and we are getting consent letters under Air and Water Acts from Haryana State Pollution Control Board every year.

ISO 14001

NFL Panipat is committed to achieve Pollution free environment and balanced ecology by adopting Environmental Management System. The Unit is conducting regular Environmental Audits and compliance with the statutory and legal requirements. Based on the environment Policy of NFL, Panipat the Unit engaged M/S KPMG Quality Registrar for carrying out audit leading to award of ISO 14001-1996 On successful completion of all the audits and statutory requirements, our Unit was recommended for this prestigious award and the Certificate was received on 1st June 2000.

“THE AWARD OF ISO 14001-1996 CERTIFICATE TO THE UNIT IS COMMITMENT TO POLLUTION FREE ENVIRONMENT IN AND AROUND THE FACTORY AND SOCIETY AS A WHOLE.”

It is a fact that pollution controls have no limits, but our efforts shall never be lacking to achieve lowest emissions. Our R&D work group is also well engaged in developing technology to improve the present treatment system and to utilize services of experts and best technology available in this regard.

It will be a pleasure for us to record here that due to effective participation of Management in the field of environment protection, Panipat Unit has got the following awards;

- Haryana Govt. awarded 1st prize for ENVIRONMENT MANAGEMENT & CONSERVATION on the World Environment Day on 5th June 1994.
- International Greenland Society has adjudged our Unit as one of the best Organization in implementing pollution control measures and awarded the JAWAHARLAL NEHRU MEMORIAL NATIONAL AWARD for the year 1995.

Safety:

Company has always maintained its consciousness towards safety of the employees. Unit has a full-fledged Safety Department, which consists of well-qualified and experienced Safety Engineers. This department ensures that the working conditions are safe, safety procedures are followed and personal protective equipments are used. A number of schemes, exhibitions, bulletins, safety competition and good house keeping contests are conducted by Safety Department for inculcating the feeling of safety amongst the employees. Safety committees at the plant level are encouraged to give suggestions to improve the safety in operation and at work place. On site Emergency Management Plan, has been prepared by the company for handling emergencies by making optional use of resources. The unit has achieved a number of awards at various times which are listed as under.

Following steps have been taken at NFL Panipat, for ensuring safety of all concerned.

1. **Safety, Health & Environment (SHE) Policy**
A clear cut SHE policy has been prepared & made known to all concerned.
2. **Built-in Safety Design**
Fool proof process instrumentation has been designed to ensure safety.
3. **Safety Procedures** have been developed & their religious implementation is ensured.
4. **Safety Training**
Safety Training is provided to all the officers & workers including contractors & their labours both by internal as well as external faculty. Company has formulated a unique Safety training policy , under which no new employee/promotee is confirmed, unless, he or she undergoes safety training organized/conducted by safety department. Contractors and their labours are also imparted safety training from time to time. Also pep talks are delivered to employees as well as contactors & their labours at their worksites during which they are told about hazards in plants, risk involved with the specific jobs executed by them & the precautions required to be taken by them for safe execution of the jobs.
5. **Environment Monitoring :**
Working areas are monitored periodically for gaseous contaminants , noise, lux level & air changes for ventillation etc. & corrective actions are taken accordingly. **Multi point continuous monitoring systems** for Ammonia, Carbon Monoxide, Hydrogen Sulphide, Chlorine & LPG are installed in Plants. Over & above these , the areas are also monitored by using portable gas monitors & Drager Tubes.
6. **Risk Assessment studies**
Risk assessment studies like **HAZOP & HAZAN** are got conducted from experts in the field & measures are taken accordingly to ensure safety of the workers.
 1. **Safety Audit & Inspection**
Third Party Safety Audits & inspections (both internal & External) are conducted periodically & their recommendations are implemented.
 8. **Accident Investigation & Analysis**
All the accident/ fires (minor, major or even near misses) are investigated & analysed thoroughly to find the real cause & the recommendations of the investigation team are implemented , to avoid the re occurrence of similar incidents
 9. **Personal Protective Equipments (PPEs)**
Both respiratory as well as non respiratory PPEs are provided to the workers for safe execution of their jobs.
10. **Safety regulations**

All the Safety regulations under various Acts & Rules are complied with religiously so as to provide safe working conditions & ensuring safety of the workers.

11. Good House Keeping

Recognising Good House Keeping as an important tool for ensuring safety of the workers an inter plant “GOOD HOUSE KEEPING COMPETITION” is organised every year.

12. Safety Suggestion scheme

Under Safety Suggestion scheme, any scheme submitted by employees to improve working condition is implemented at the earliest. The employee giving the safety suggestion is motivated by giving certificates & awards during various celebrations.

13. Safety Committees

To ensure workers participation in Safety Management, Central Safety Health & Environment Committee under the Chairmanship of Unit In charge & other plant level Safety Committees are working smoothly with equal representation from workers & management.

14. Safety motivational programs

To create safety awareness & consciousness among the workers, various Safety Motivational programs are conducted / organized. Safety Week is celebrated every year & various safety promotional activities carried out during the Safety week.

As a result of management’s commitment towards safety of the workers & continuing efforts to further improve it, there had been no reportable accident since 22.03.2002. uous accident free period equivalent to 2.94 million Manhrs. Also NFL Panipat has been accredited as ISO 9002 & ISO 14001 organisation.

Salient features and Action Taken Report of energy audit by NPC

ENERGY SAVING MEASURES

Sl.No	Recommendations	Action Taken	Energy Saving in Mkcal/MT Urea		Financial gain, Rs Lac		Investment, Rs Lacs		Year of completion
			NPC	OUR	NPC	OUR	NPC	OUR	
BOILERS									
1	Reducing Exit Flue Gas Temp.	Continuous job. FG temperature at air heater exit is controlled by optimizing operating parameters, regular soot blowing, deashing of economizer hopper, avoiding passing of soot blowing steam to air preheater. Besides, the heat- transfer elements, both hot & cold end, are opened during annual s/d and damaged elements replaced with new one.	0.022	0.017(as calculated)	59	48.88 (in terms of steam)	40	13.2 (Only for 'C' type elements)	Dec' 04
2	Installing of VFD for ID Fan	Procurement of VFD for ID fans is in progress.	0.0077	0.009(as calculated)	19.17	40.48 in terms of powr	60	36.00	April2005
AMMONIA PLANT									
3	Reducing Discharge Pressure of BFW Pumps	Tried, but further reduction in discharge pressure is not possible.	0.01	NA	41.8	NA	60	NA	NA
STEAM GENERATION PLANT									
4	Lowering Hydro Vector height in SGP	Job carried out	0.0012	0.0008 Actually achieved	2.91	3.6 (in terms of powr)	1	Negligible	complete
COOLING TOWERS									
5(a)	Revamping cooling water pumps	Procurement of high efficiency modified impellers is in progress.	0.05	0.0073(as per M/S M&P, the OEM)	124	32.84 in terms of powr	400	29	April2005
(b)	Coating of cooling water pumps	Not required as the new impellers are of SS make.	0.013	NA	40.08	NA	22	NA	NA
RAW WATER PLANT									

6	Installing high efficiency raw water pumps & revamping filter water pumps	Presently not under consideration as Raw Water consumption is likely to reduce with the revamping of the plant.	0.0045	NA	11.16	NA	18	NA	NA
TOTAL			0.1084	0.0341	298.12	125.4	601	78.2	

AMMONIA / UREA PLANTS BASED ON PARTIAL OXIDATION OF FUEL OIL BY SGP ROUTE

