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|  <p>नशनल फर्टिलाइजर्स लिमिटेड एन. एफ. एल. NATIONAL FERTILIZERS LIMITED VIJAIPUR</p> | <p>NATIONAL FERTILIZERS LIMITED, VIJAIPUR-II, GUNA (M.P.)</p> <p>NATIONAL ENERGY CONSERVATION AWARD-2007 (LARGE SCALE INDUSTRY – FERTILIZERS)</p> | |
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1. COMPANY PROFILE

National Fertilizers Limited, a Govt. of India Undertaking, was incorporated on 23rd August 1974. It is the second largest producer of nitrogenous fertilizer in the country and has four operating fertilizer units located at Nangal, Bhatinda, Panipat and Vijaipur with a total installed capacity of 32.083 lakh tones Urea.

The Vijaipur unit, which is a ISO 9001:2000 & 14001:2004 certified unit, comprises of two streams-Vijaipur-I and Vijaipur-II, which went into commercial production in July, 1988 and March, 1997 respectively. Both the streams are based on “*Steam reforming process*” of Haldor Topsoe (Denmark) for Ammonia plants with Natural gas feed in Vijaipur-I & NG/Naphtha feed in Vijaipur-II. The Urea plants are based on Snam Progetti (Italy) ‘s “*Ammonia stripping process*”

2. ENERGY CONSUMPTION

The details of various energy inputs and specific energy consumption during the last three years are highlighted in the table below. NFL Vijaipur has made a strategic tie up with M/s IOCL & M/s BPCL w.e.f. 01.04.2005 to get Regasified Liquefied Natural Gas (RLNG), which is cheaper than Naphtha. Furthermore, it is cleaner fuel as compared to Naphtha. This has resulted in considerable reduction in the energy cost of Urea as compared to last year. However, availability of RLNG is not sufficient to phase out the use of Naphtha. The % mix of NG, RLNG & Naphtha use depends on the availability of Natural Gas from M/s GAIL & RLNG availability from IOCL & BPCL. The details of various energy inputs and specific energy consumption during the last three years are highlighted in the table below.

| DESCRIPTION | UNIT | 2004-05 | 2005-06 | 2006-07 |
|---|--------------|-----------|----------|-----------|
| Annual Urea Production | Lakh MT | 9.44500 | 9.26203 | 9.74605 |
| Total Electric Energy consumption | Thousand MWH | 1018.39 | 1008.75 | 1063.41 |
| Total Thermal Energy consumption | GCal | 919381.31 | 0.00 | 915310.08 |
| Total Energy consumption (Electrical+Thermal+Raw material) | GCal | 5162637 | 5083002 | 5277486 |
| Total Sp. Energy Cons. (Electrical+Thermal+Raw material) | Gcal/MT | 5.464 | 5.488 | 5.415 |
| Total Manufacturing Cost | Lakhs Rs. | 56355.58 | 46985.64 | 52166.86 |
| Total Energy Cost | Lakhs Rs. | 46589.13 | 37754.00 | 43341.14 |
| Total Energy Cost (Electricity + Thermal) | Lakhs Rs. | 12804.13 | 7618.28 | 7876.13 |
| Total Energy cost as %age of Manufacturing Cost | % | 82.67 | 80.35 | 83.08 |

- Total Energy cost is more in 2004-05 due to use of costlier fuel, Naphtha, on account of limitations in Natural gas availability from M/s. GAIL. Further the Cost of Naphtha has also increased leading to increase in energy cost.

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3. ENERGY CONSERVATION COMMITMENT, POLICY AND SET UP

NFL, Vijaipur is very much committed to Energy Management and for the same has a dedicated Energy management/ Conservation Cell, comprising of members from various Deptt. / Disciplines & headed by DGM (TS). Energy Manager, who is also a Certified Energy Auditor, is coordinator of the cell. Energy conservation Cell is associated with energy monitoring & recommends for energy improvement schemes & day-to-day trimming of plant to improve energy. Based on in-house study / energy audit, a number of energy saving schemes have been implemented / are being implemented / planned to be implemented. For all ENCON measures, the EC Cell is the principal functioning & Coordinating cell. The functioning of Energy Management is from the top. The head of the unit holds regular weekly meetings to discuss the status of energy consumption levels & action taken on ENCON options. The middle management, consisting of departmental in charges, reviews the ENCON options identified by the Energy Cell or the Audit Group for implementation. ENCON options / schemes, requiring higher investment are put up to the top management (Head of unit, CMD, Directors) for approval of budget & implementation. Further, suggestion scheme system for workers is in vogue in the unit. Energy saving suggestions are given utmost priority for implementation & are suitably rewarded. Energy saving modifications from plant are also given top priority for early implementation. Energy conservation awareness programme are held through out the year.

In addition to the monthly energy audit based on inputs, detailed plant wise energy audit is carried out by in-house energy cell or selected technical audit team. Feasibility study for capacity enhancement along with associated Energy savings HAS BEEN CONDUCTED by M/s HTAS & M/s Snamprogetti. The scheme has been approved by the Board of Directors & ITB under approval.

4. ENERGY CONSERVATION ACHIEVEMENTS

The specific energy consumption for the last three years are highlighted below.

| Year | Overall specific energy consumption (Gcal/MT of Urea) | % reduction in energy consumption (base year 2004-2005) | Monetary saving effected (base year 2004-2005) in Rs. Lakhs |
|-------------|--|--|--|
| 2004-2005 | 5.464 | - | - |
| 2005-2006 | 5.488 | -0.44 | -521.27 |
| 2006-2007 | 5.415 | 0.90 | +1345.75 |

All the savings have been shown in terms of Naphtha.

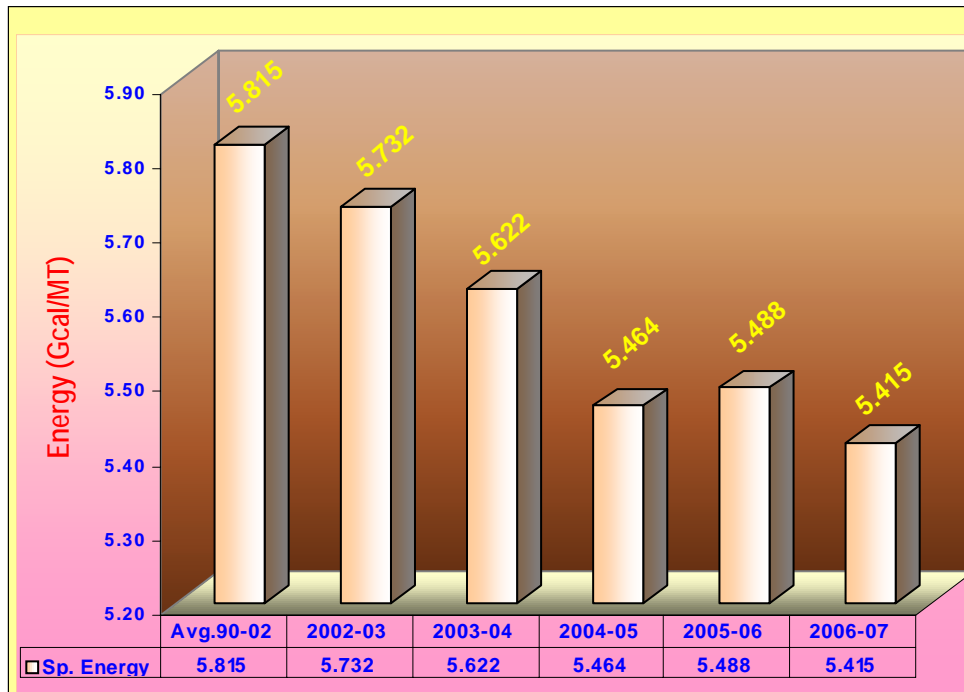


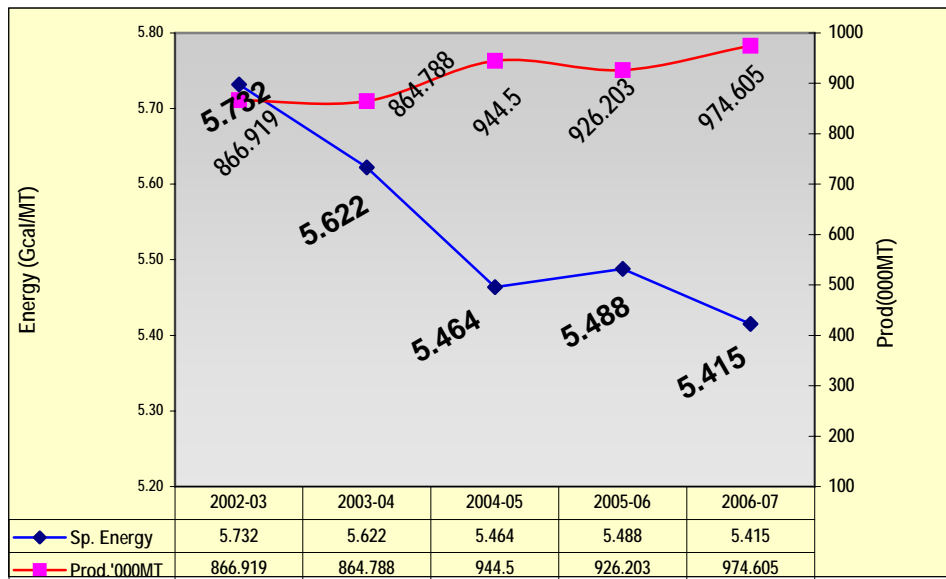
**NATIONAL FERTILIZERS LIMITED, VIJAIPUR-II, GUNA
(M.P.)**

**NATIONAL ENERGY CONSERVATION AWARD-2007
(LARGE SCALE INDUSTRY – FERTILIZERS)**

PERFORMANCE OF VIJAIPUR-II PLANTS AT A GLANCE

| ITEM | UNIT | 2004-05 | 2005-06 | 2006-07 |
|-----------------------|---------|---------|---------|---------|
| AMMONIA | | | | |
| AMMONIA PRODUCTION | MT | 546490 | 535424 | 560779 |
| CAPACITY UTILIZATION | % | 108.95 | 106.74 | 111.80 |
| ON STREAM DAYS | DAYS | 354.19 | 343.49 | 358.78 |
| ONSTREAM EFFICIENCY | % | 97.04 | 94.11 | 98.30 |
| AVG. PLANT LOAD | MTPD | 1543 | 1559 | 1563 |
| NO. OF INTERRUPTIONS | NOS. | 2 | 4 | 2 |
| SPECIFIC ENERGY CONS. | Gcal/MT | 7.627 | 7.629 | 7.497 |
| UREA | | | | |
| UREA PRODUCTION | MT | 944500 | 926203 | 974605 |
| CAPACITY UTILIZATION | % | 109.24 | 107.13 | 112.72 |
| ONSTREAM DAYS | DAYS | 352.39 | 342.86 | 356.93 |
| AVERAGE PLANT LOAD | MTPD | 2680 | 2701 | 2731 |
| ONSTREAM EFFICIENCY | % | 96.55 | 93.93 | 97.79 |
| SPECIFIC ENERGY CONS. | Gcal/MT | 5.464 | 5.488 | 5.415 |





MAJOR ENERGY SAVING SCHEMES IMPLEMENTED DURING 2006-2007 ARE HIGHLIGHTED BELOW.

In its constant endeavour to optimise and improve upon the present systems, besides optimization of process parameters & maintenance practices, energy saving schemes were implemented recently after thorough & extensive study in the related fields.

A) REPLACEMENT OF DEFECTIVE DAMAGED MUFFLE BLOCKS OF PRIMARY REFORMER OF AMMONIA PLANT:

100 Nos. of burner blocks of Primary Reformer furnace were defective & partially damaged, leading to substantial quantity of heat losses from the furnace. The blocks were replaced with new ones resulting in saving of thermal energy.

Photo of damaged muffle blocks of Primary Reformer before repair:



Photo of muffle blocks of Primary Reformer after repair:



Due to damage in muffle blocks of Primary Reformer we were losing the heat of about 199 Mkal/yr. After replacement we can now save this heat loss which is equivalent to 26.54 kl of naphtha.

- **PAYBACK:** Annual savings : Rs. 42.09 lakhs
Investment : Rs. 6.77 lakh
Payback : Around 2month

Besides, we have also replaced the damaged / defective insulations, steam traps, steam leakages through valves / joints which has resulted in significance energy & financial savings.

➤ **Replacement of defective steam traps / valves & attending other steam leakages:**

- **PAYBACK:**
- Annual savings :Rs. 33.92 Lakhs
- Investment : Rs. 2.00 lakh
Payback Around < 1 month

➤ **Replacement of damaged Insulations:**

- **PAYBACK:**
- Annual savings :Rs. 44.9 Lakhs
- Investment : Rs. 3.37 lakh
Payback Around < 1 month

5. ENERGY CONSERVATION PLANS AND TARGETS

The unit has the following future action plan in the pipeline for conservation of energy.

| Sl. No. | Plan | Implementation (Year) | Annual Savings | |
|---------|---|-----------------------|----------------|------------------------------------|
| | | | Energy, GCal | Lakh, Rs. |
| 1. | Capacity enhancement of Ammonia & Urea plants of Vijapur II There shall also be added benefit of Energy saving with better capacity utilisation . | - | 103752 | 2905 (Based on cost of Naphtha) |

6.0 ENVIRONMENTS AND SAFETY

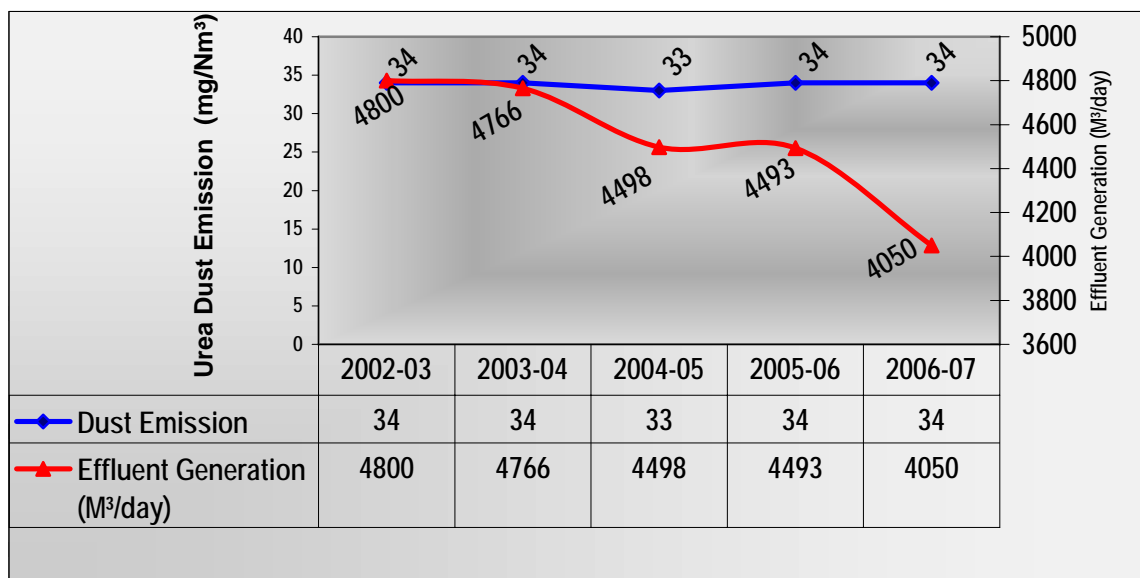
6.1.ENVIRONMENT

National Fertilizers Limited has its own corporate Environment Management Policy, which gives utmost importance to 'Environment Protection' in and around the complex. N.F.L., Vijapur is an ISO-14001: 2004. The unit has been consistently upgrading the concept of conservation, recycle & reuse for optimum utilization of inputs. This has also helped in reducing waste discharges thus preventing pollution. The unit has bagged many prestigious awards for efficient environment control.

A separate Effluent Monitoring Cell (EMC) has been established to keep round the clock vigilance on effluent quality so that the discharges are much lower than Minimal National Standards. In order to inculcate Environment Awareness amongst masses, World environment Day, Earth Day, Ozone Day are observed.

In addition to the Water Pollution Control Measures incorporated since Design, NFL Vijapur in its endeavour to improve upon the systems has indigenously developed A Pilot plant for treatment of Urea Bearing Effluent by BIO-HYDROLYSIS

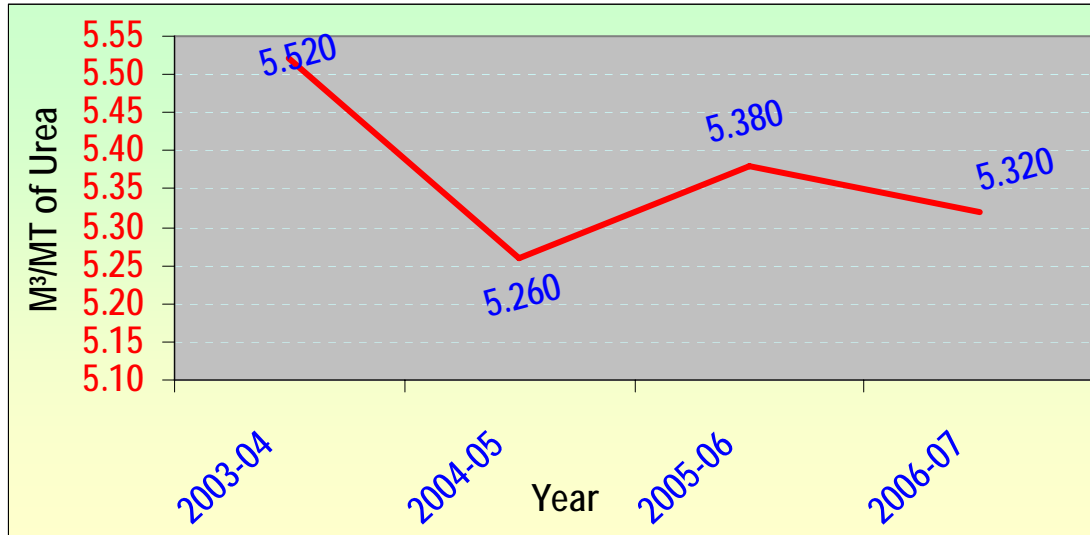
EFFLUENT GENERATION & PRILLING TOWER DUST EMISSION (VP-I & II)





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PROCESS WATER CONSUMPTION (VIJAIPUR-I & II)



6.2 SAFETY

National Fertilizers Limited, Vijapur has its own Safety policy. It aims at creating safe working conditions & habits in order to eliminate Industrial Accidents. National Fertilizers Limited, Vijapur has adopted several measures to achieve this goal.

- Integration of safety with various departments, familiarization of the employees with the general and special safety practices like Safe Work Permit and enforcing them in their work place,
- Deputation of employees in various in house as well as external programme, celebration of National Safety day.
- Safety audit is conducted every year by external agencies..
- Plant level & Central Safety Committees are set up who suggest safe practices for implementation.
- Combined Risk Analysis report of Hazardous Plant i.e. M/s GAIL, IOCL and NFL at Vijapur was carried out by M/s PDIL Sindri. Onsite Emergency plan (Rev.03) and safety report revised accordingly. Based on combined Risk analysis report Offsite emergency plan is being revised by M/s NFL Vijapur on behalf of Collector Guna, Madhya Pradesh.
- Mutual Aid Agreement with M/s GAIL , Vijapur.
- Accident free period: 49,000,00 Hrs (2006-07)