

GlaxoSmithKline Pharmaceuticals Limited, Nashik

A. Company's Profile

GlaxoSmithKline Pharmaceuticals Plc.

- ✚ GlaxoSmithKline (GSK) is a world leading research-based pharmaceutical company with a powerful combination of skills and resources that provides a platform for delivering strong growth in today's rapidly changing healthcare environment.
- ✚ Headquartered in the UK and with operations based in the US, the new company is one of the industry leaders, with an estimated seven per cent of the world's pharmaceutical market.

GlaxoSmithKline Pharmaceuticals Limited - India

- ✚ GlaxoSmithKline Pharmaceuticals Ltd. – India is the Number One Pharmaceutical company with a market share of 5.9 %. GSK commands the number one position in six of the 10 therapeutic categories in which it operates.
- ✚ Other than pharmaceuticals. GSK has two businesses - Agrivet Farm Care (AFC) and Qualigens Fine Chemicals (QFC).
- ✚ AFC is the market leader in the animal health sector with an estimated market share of 10 per cent. It has a significant presence in the cattle segment and also markets a range of specialized poultry products.
- ✚ QFC has an estimated market share of 29 per cent in the laboratory chemicals market. It also has a significant presence in the Diagnostics business.
- ✚ GSK – Pharma has two manufacturing units in India, located at Thane and Nashik
- ✚ The strong field force of GSK, backed by a nation wide network of stockiest, ensures that the company's products are readily available across the nation. This combined with the quality of the products means that GSK is able to strengthen the hands of doctors by offering superior treatment and healthcare solutions. It is our constant endeavor to improve the quality of life by enabling people to do more, feel better & live longer.

Spirit of GSK

We undertake our quest with the enthusiasm of entrepreneurs, excited by the constant search for innovation. We value performance achieved with integrity. We will attain success as a world class global leader with each and every one of our people contributing with passion and an unmatched sense of urgency.

Vision

Our vision for the future is powered by our business drivers. It finds purpose and direction with our strategic intent. It is guided by our corporate culture that places people and capabilities as the pivot that changes and transforms situations.

Our Strategic Intent

We want to become the indisputable leader in our industry

Mission

GSK's mission is to improve the quality of human life by enabling people to do more, feel better and live longer.

GlaxoSmithKline Pharmaceuticals Limited - Nashik

Product profile :

- ✚ No. of Products - 43
- ✚ No. of Packs - 76
- ✚ Dosage Forms - Tablet, Liquids, Ointments, Ampoules, Aerosols & Topical
 - Sterile Powders.

Achievements:

- ✚ It has won many accolades in the form of inter factory Fire Fighting & First Aid competitions. The local Manufacturer's Industrial Association also adjudged it the best factory for Environment Beautification Contest.
- ✚ Consecutive three million man-hours worked without lost time accident.
- ✚ Chairman's award for HS&E 1998.
- ✚ Benchmarking in Ointments amongst Group companies -Nashik Best in class in 7 out of 16 parameters.
- ✚ ISO 14001 & OHSAS 18001 Certification.
- ✚ **CEO'S EHS Excellence recognition awards for the year 2002 & 2003 for :-**
 - **Energy & conservation initiatives**
 - **Low sulfur fuel for cost savings.**
 - **Elimination of CFC'S from centralized refrigeration system.**
- ✚ Excellence recognition awards for various initiatives in lean sigma & non-lean sigma categories.

GSK India as a Corporate Citizen

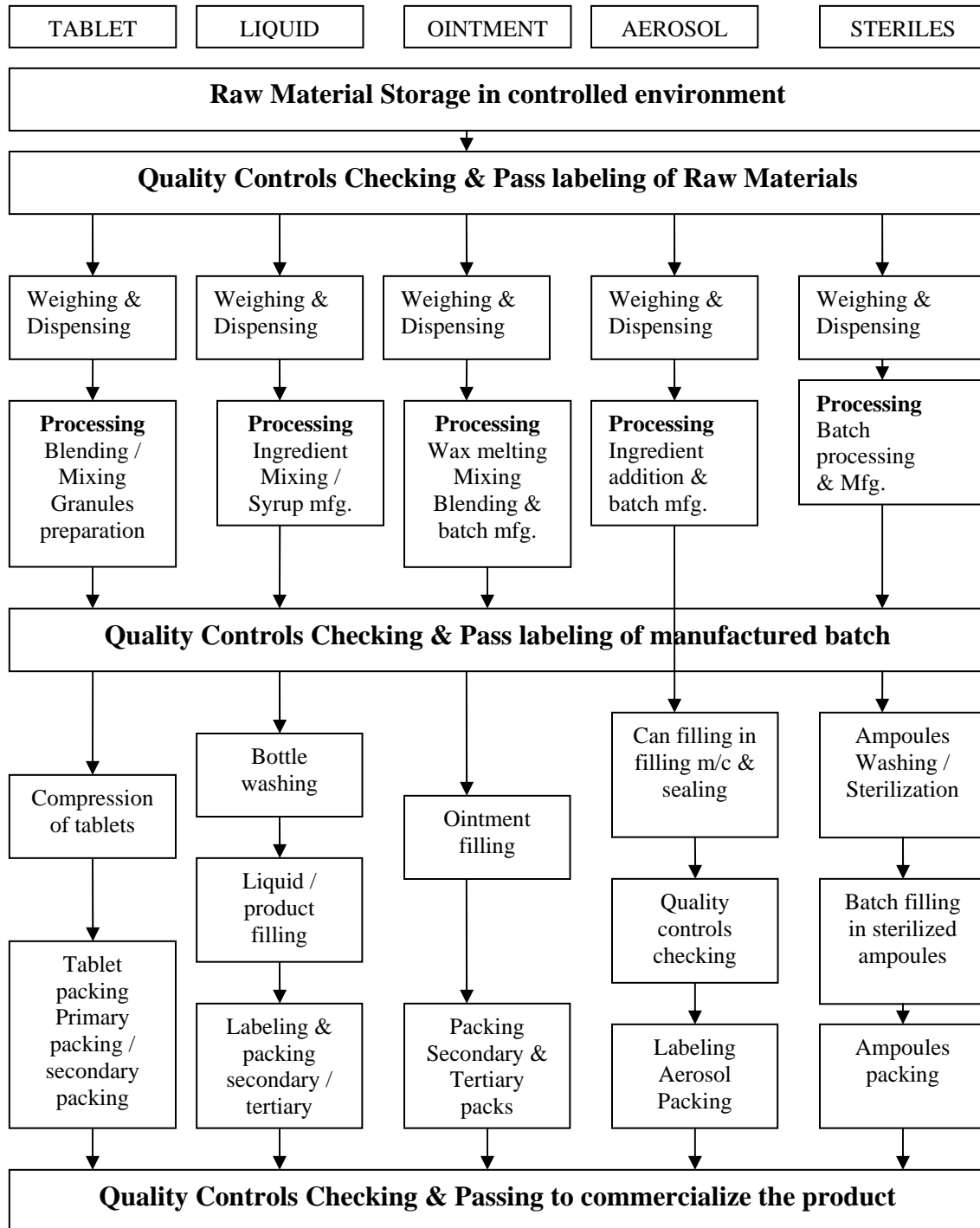
- ✚ The factory has a highly sophisticated disaster-cum-emergency plan.
- ✚ We have adopted a village 40 Kms from factory site for medical service & aid towards the well being of tribal population.

- ✚ Our Effluent Treatment Plant adheres to all the laws of the land & is distinctly recognized in the zone.
- ✚ We believe in total adherence to all the Regulations.

GSK India as a Good Employer

- ✚ Besides paying its employees reasonably well, GlaxoSmithKline also provides other welfare amenities which has resulted in cordial I.R. situation without any work disruptions for the last several years :
 - Crèche, Medical Facilities, Subsidized Canteen , Doctor on Site & Transport
 - Sports and Cultural Activities
 - The Company strives to ensure that each employee finds his/her job satisfying and enjoys secure and rewarding future with the Company.

B. Process flow charts :



C. Energy Management Policy

GlaxoSmithKline Pharmaceuticals Limited, India, is committed to high standards of Energy Management as an integral part of business activities, in line with corporate values and continuous improvement. GlaxoSmithKline Pharmaceuticals Ltd., India's guiding principle is that "**energy saved is energy generated**".

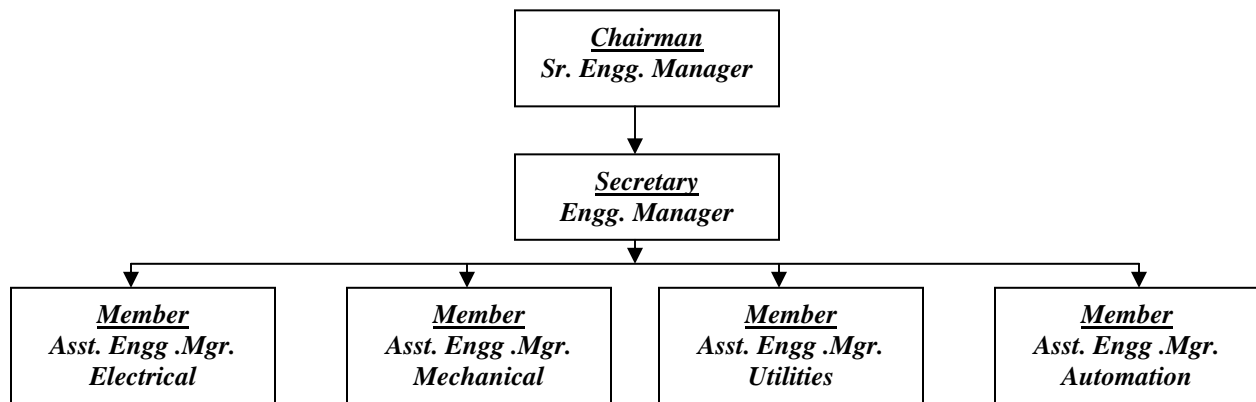
It is the policy of GlaxoSmithKline Pharmaceuticals Limited, Nashik to:

- Efficiently utilize the energy supplied by external authority for carrying out manufacturing activities throughout the factory.
- Operate our business in an energy efficient, environmental friendly and socially responsible manner;
- Commit to continuous improvement in energy conservation performance;
- Comply with legal requirements and global GSK Standards;
- Make Energy conservation an integral to all GSK Pharmaceuticals business processes, planning and decision making;
- Establish business practices and Energy conservation strategies that optimally utilize resources and prevent pollution to ensure the long-term sustainability of GSK Pharmaceutical Ltd, India and the global environment;
- Ensure that all employees work with due regard to energy management conservation approach. Their attitude to energy conservation will be a factor in determining their career advancement.
- GSK Pharmaceutical Limited, India will use effective systems, metrics and goals in the management of all of our Energy Management activities.

S. A. Phadke
Sr. Engineering Manager, Nashik Factory

Issued on : Jan. 2003.

C. Energy Conservation Cell



D. Our Commitment Towards Energy Conservation:

Approach: A distinct approach i.e. operational excellence in Energy conservation has been adopted by the company in order to make the GSK-Nashik as the most energy efficient pharmaceuticals manufacturing facility of the world.

Operational Excellence in Energy Conservation:

What it is

Operational Excellence is a new way of working for our organization. It combines the best of whatever went in past and is fresh approach to achieving excellence in Energy Management.

O.E. Components:

- Common language & processes
- Education & training.
- Knowledge Management
- Lean Sigma, plus methods & tools to continuously measure & improve.
- Performance management & bench marking.

Why it is important

The ambition is to create, in GlaxoSimthKline, the best pharmaceutical company in the world. Some elements of the company can already claim to be the best in the industry, but not all. There are many areas of energy management where we know we need to raise our performance and maintain it at those higher levels. Like wise, there are areas within the global functions where their processes can be improved.

What it means for us

Operational excellence will be a challenge for everyone in energy management. It will encourage us to challenge the way we do our job & the processes & techniques used by us. It will challenge long held beliefs & entrenched practices. It will challenge the good as well as merely satisfactory in the search for excellence. Initially, it may make many people feel uncomfortable, because change makes us all feel uncomfortable, to some degree or another.

However, Operational excellence presents great opportunity for us all. It presents opportunities for training & learning, for developing skills & competence's, and for career development. It also presents opportunities to work with colleagues from other sites and functions to improve the way we operate.

In summary, Operational Excellence provides the tools for us to achieve excellence in our function, site or business community.

The fourth component of O.E. i.e. “Lean Sigma, plus methods & tools to continuously measure & improve” is specifically practiced to effectively initiate & implement the energy conservation measures across the site.

Lean Sigma Concept:

- ✚ Base lining – To know, where we are?
- ✚ Identifying the Waste / variations
- ✚ Evaluating the cost of waste
- ✚ Brain storming to find out the means / measures for elimination or minimization of cost of waste
- ✚ Implementation of most suitable option.
- ✚ Post implementation performance evaluation & continuous monitoring & control.

Base line study of utilities operated throughout the factory has resulted in following facts & figures towards op-ex on various utilities provided for manufacturing activities across the factory.

Per unit op-ex on utilities :

Sr.no.	Description of Utilities	Unit	Cost in Rs. per unit
1	Potable water supply	Rs./m3	22.30
2	Raw Steam supply	Rs./kg.	1.33
3	Cooling water supply	Rs./m3/hr	10.10
4	Compressed air supply	Rs./m3	1.02
5	DM Water Supply	Rs. / m3	199
6	Distilled water supply	Rs. / m3	415
7	Clean Steam supply	Rs./kg.	2.34
8	Chilled water supply	Rs. / TR	7.34

The implementation of lean sigma concept in energy conservation measures has resulted in identifying, analyzing & elimination of waste & variations in a realistic & scientific way in order to make the system most energy efficient / economical in all respect.

- ✚ The energy conservation initiatives / achievements play a key role in yearly performance appraisal of every individual of Engineering Dept..
- ✚ As a part of lean sigma recognition / appreciations the initiatives are short listed & sent for competition at world level. Some of our initiatives have been recognized world wide & bagged first prizes at world level competition.
- ✚ Yearly budget of resources specifically requires commitment for energy conservation every year.

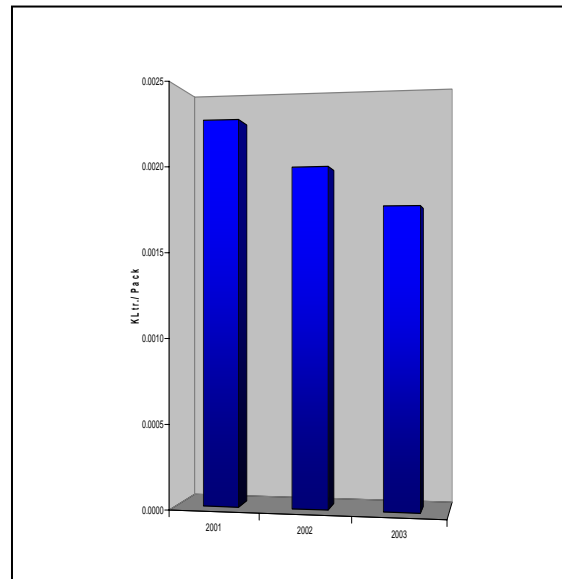
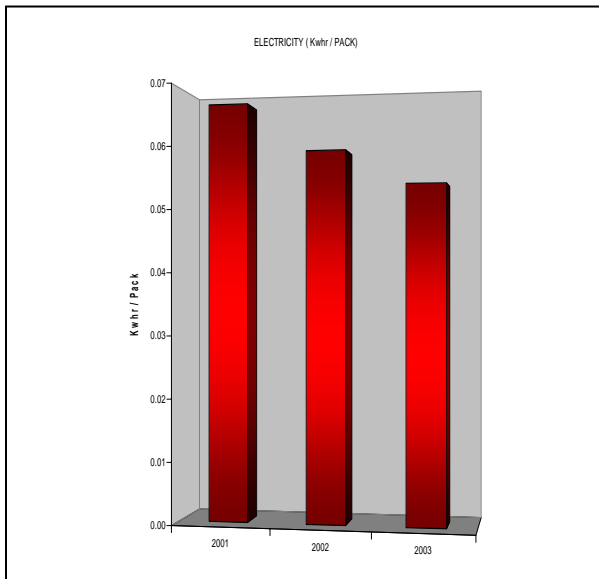
E. Energy Consumption :

A proactive approach towards implementation of Energy conservation measures has resulted in substantial reduction in resources consumption per unit packs of production. The trends of specific consumption of water, electricity & steam are encouraging to initiate more efforts towards conservation of energy resources.

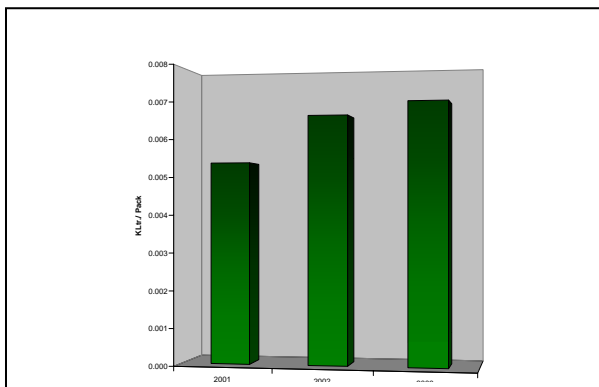
YEAR	PRODUCTION	ELECTRICITY	WATER	F.O.
	Million packs	Million Kw/hr	Million KL	Million KL
2001	109.09	7.33	0.25	0.59
2002	139.75	8.31	0.28	0.93
2003	152.72	8.24	0.27	1.07

Trends of specific resources consumptions:

Electrical power consumption in Kw/hr / Pack Potable Water consumption in Kl / pack



Furnace Oil Consumption in KL / Pack



F. Major Energy Conservation projects implemented during 2003

1. Installation of solar Water Heater system :

Status before implementation of the project :

- a. Water heating through electrical heaters
- b. Op-Ex per day – Rs. 713.00
- c. Op-ex per annum – Rs. 2,31,725.00

Status After implementation of the project :

- a. Water heating through solar system.
- b. Op-ex per day – Nil
- c. Op-ex per annum – Rs. 50,000.00
(electrical heating during foggy weather)

Savings per annum After implementation of the project :

- a. Savings per annum – Rs. 1,78,250.00



2. Replacement of Heatless air dryer with Refrigerated Air dryer :

Status before implementation of the project :

- a. Compressed air is dried using heatless air dryer where in the loss of compressed air is in the range of 10 – 14 % of rated capacity.
- b. Cost of Waste due to air loss per day Rs. 460.00
- c. Cost of waste per annum – Rs. 1,38,143.00

Status After implementation of the project :

- a. The desired dew point of C.A. is achieved through refrigerated air dryer.
- b. Op-ex per day – Rs. 53.00
- c. Op-ex per annum – Rs. 1333.00

Savings per annum After implementation of the project :

- a. Savings per annum – Rs. 1,39,809.00

3. Installation of Ultra filtration Plant for supply of WFI quality water for sterile washing activities :

Status before implementation of the project :

- a. WFI Quality water was supplied through MCDWP which utilizes huge amount of steam for producing WFI quality water.
- b. Steam consumption per day – 3402 Kg.
- c. Op-ex on steam per annum – Rs. 11,95,943

Status After implementation of the project :

- a. The WFI quality water for washing activities is produced by Ultra filtration plant which does not require steam supply for operation.
- b. Steam consumption – Nil
- c. Op-ex on steam per annum – Nil

Savings per annum After implementation of the project :

- a. Savings per annum – 11,95,943.00



4. Installation of VFD for reciprocating air conditioning plant :

Status before implementation of the project :

- a. Mechanical control on loading & unloading of plant based on setting of loading control mechanism resulting in fluctuating conditions, frequent switching operation under fluctuating loading conditions.
- b. Electricity consumption per day – 205 Kwhr.
- c. Op-ex per day – Rs. 943.00

Status After implementation of the project :

- a. Smooth control through VFD to run the motor at low speed during unloaded mode of operation resulting in favourable conditions with energy savings.
- d. Electricity consumed per day – 168 Kwhr.
- e. Op-ex per day – Rs.772.00

Savings per annum After implementation of the project :

- a. Savings per annum – Rs. 51,060.00



Note : The successful implementation of this project has triggered us to go for VFD for higher capacity reciprocating air conditioning plants where the potential of savings is in the range of **5 to 6 lakhs per annum**. We have already gone for 2 plants to utilize the energy saving potential.

5. Energy Management & operational control through SCADA System :

Status before implementation of the project :

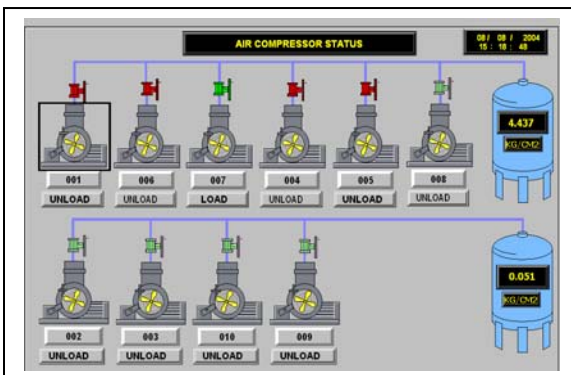
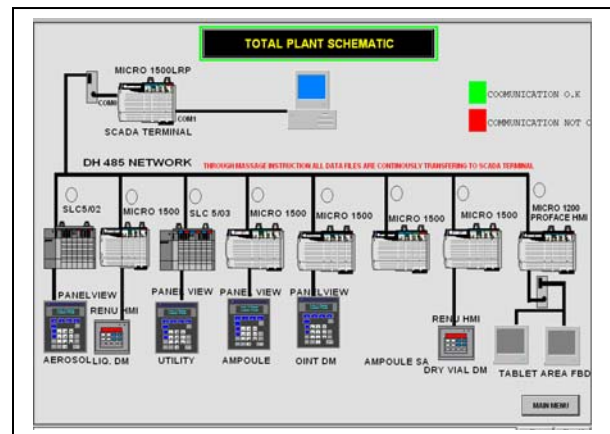
- Operational control at shop floor level by the operator only, no data available for analysis.
- Energy consumption trends not available for analysis.
- Specific energy consumption for various products not available.

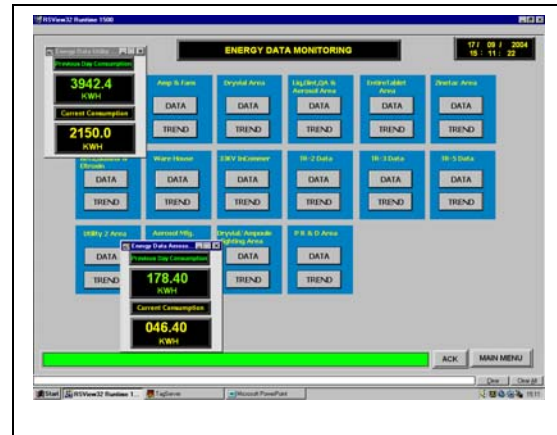
Status after implementation of the project :

- Real time data available.
- Operational control extended to higher management.
- Trends to analyse & improve made available directly on screen.
- Automation resulted in optimum utilization of equipment run time.

Benefits After implementation of the project :

- Reduction in energy consumption through better operational controls on utility equipment at Utility – I.
- Reduction in energy consumption through better operational controls on utility equipment at Utility – II.
- Real time consumption trend of individual dept.
- Automatic control resulted in optimum utilization of eqpt. Run time.





6. Installation of Drykor dehumidifier(Lithium Chloride based dehumidification system) :

Status before implementation of the project :

- Dehumidification of production area required running of chilled brine plants, steam supply etc. in order to maintain the required humidity in side the production area.
- Op-ex per day – Rs. 4040.00

Status After implementation of the project :

- The drykor Lithium Chloride based dehumidifier has been installed to absorb the moisture in the air & ensure the supply of dehumidified air to production area in order to maintain the required humidity at production floor. The system independently take care of the humidity to the extent of 6 months on a year. Resulting in huge amount of energy savings by stopping the CHB plants when not required.
- Op-ex per day – Rs. 1354.00

Benefits After implementation of the project :

- Savings per annum – Rs. 3.02 Lakhs

Other Energy Conservation projects implemented during the year 2003

1	Reduction in LPG Consumption by installation of gas saving device for burner at canteen
2	Replacement of vac. Blower with portable vac. Blower at Eltroxine cubicles
3	Replacement of under rated motor with optimum capacity motor at PPID AHU
4	Reduction in energy consumption of scrubbers by isolating & removing of exhaust blowers.
5	Reduction in energy consumption by modification of pulley size of DCU at tablet service area.
6	Reduction in electrical energy consumption by replacment of condenser of CHB PLANT OF U-II with higher capacity condenser.

7	Reduction in Energy consumption by reducing the no. of dehumidifiers in operation at Zinetac Packing Cubicles.
8	Replacement of conventional ballast with electronic ballasts
9	Replacement of conventional blowers with energy efficient blowers for 9 nos. of air curtains
10	Replacement of DM Water usage with UV treated potable water at Ampoule VAC testing area.
11	Replacement of tube light fittings cover with transparent acrylic covers
12	Reduction in electrical energy consumption through operational controls of utility equipments at Utility - I
13	Reduction in electrical energy consumption through operational controls of utility equipments at Utility - II
14	Installation of Ultra filtration Plant for supply of WFI quality water for DV Washing activities.
15	Installation of push to flush valves in change rooms to avoid wastage of water.
16	Elimination of open tanks (18 nos. of 1 HP pumps) dedicated pumping system of B/W machines by providing Water supply through centralised circulation system.
17	Replacement of conventional electrical powered area exhaust blowers with turbine type self powered exhaust blowers in Ampoule S.A.
18	Installation of DryCore dehumidifier system in cobadex air conditioning system

Energy Conservation Plans & Targets :

Sr. no.	Energy conservation initiatives	Anticipated savings in Rs. Per annum in Lacs	Approximate Investment in Rs.(Lacs)	Project commencement & completion year
1	VFD Installation for A/C Plants, air compressors, package A/C Units & blowers	12	9	2004 - 2005
2	Procurement & installation of energy efficient blowers	4	2	2005
3	Reduction in Maximum Demand by rescheduling the operating horus of major production eqpts.	2.5	0	2004
4	Effective Air circulation instead of air conditioning in non-manufacturing areas.	4	8	2005
5	Installation of energy efficient motors & pumps	3.5	6	2004
6	Upgradation of dust extraction system.	4.5	8	2005
7	Utilization of low tariff zone.	3.75	2.6	2004
8	Upgradation of manufacturing facility by procurement & installation of energy efficient, improved productivity manufacturing eqpts.	8	15	2004-2005
9	Upgradation of lighting system throughout the factory	3.28	5	2004-2005
10	Implementation of condition monitoring system for utility eqpt.	1.5	2	2004

G. Our Commitment towards Environment, Health & Safety

GlaxoSmithKline Pharmaceuticals Limited, Nashik, is committed to high standards of Environment, safety and Health management as an integral part of business activities, in line with corporate values and continuous improvement. GlaxoSmithKline Pharmaceuticals Ltd., India's guiding principle is that all accidents are preventable and all identified Health risks are containable.

GlaxoSmithKline, Nashik is committed to implement the environmental, health & safety policy laid down by the global organisation. To meet the requirements of policy, objectives & targets, Nashik site has agreed to implement the environmental management system as a tool. The entire EMS system is based on OE principals & PDCA cycle.

Policy Statement

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It is the policy of GlaxoSmithKline Pharmaceuticals Limited, Nashik to:

- Protect the health and safety of our fellow employees, contractors, visitors and others affected by our operations;
- Operate our business in an environmentally and socially responsible manner;
- Commit to continuous improvement of Environment, Health and Safety performance;
- Comply with legal requirements and global GSK Environment, Health and Safety Standards;
- Make Environment, Health, Safety and Loss Prevention integral to all GSK Pharmaceuticals business processes, planning and decision making;
- Establish business practices and Environment, Health, Safety and Loss Prevention strategies that optimally utilize resources and prevent pollution to ensure the long-term sustainability of GSK Pharmaceutical Ltd, India and the global environment;
- Adopt a comprehensive approach to product stewardship, which includes key suppliers and contract manufacturers;
- Interact and cooperate actively with key stakeholders in resolving issues and improving performance.
- Ensure that all employees work with due regard to their own safety and health and that of others. Their attitude to safety will be a factor in determining their career advancement.
- GSK Pharmaceutical Limited, India will use effective systems, metrics and goals in the management of all of our Environment, Health and Safety activities.

C.V.Chimote
Sr.General Manager,
Nashik Factory

Issued on : Jan. 2003.

ACHIEVEMENTS OF NASHIK FACTORY :

- ✚ GlaxoSmithkline took the top honour from amongst 229 companies by Business World.
- ✚ High scoring of 86% in G.R.M. and Engineering audits.
- ✚ Ointment benchmarking process - Best in Class 9 out of 16 criteria.
- ✚ “Best Factory” for environment beautification in a contest held by the Local Manufacturer’s Industrial Association
- ✚ WHO certification to Nashik Factory products
- ✚ Three Million man-hours worked without Loss Time Accident. Site received with Chairman’s award for the Health, Safety & Environmental Management.
- ✚ **Commended for energy conservation efforts by petroleum conservation research association of India.**
- ✚ **ISO 14001 and OHSAS 18001 certified site**
- ✚ **Commendation from the group for environmental projects**

Execution of Policy Statements:

1. Legal & Other Requirements –

- All relevant legislation, regulations & other requirements to which company subscribes are identified & are continuously accessible.
- Management of compliance with legislation & other requirements.
- Review of register for legislation.
- Compliance with the statutory requirements pertaining to environmental related issues is a vital part of EMS.

2. Objectives & Targets :

The environmental objectives flow from the environmental policy to which the company is committed & are quantified wherever applicable. Nashik has taken following objectives & targets in the field of environmental management for the year 2004. These objectives & targets are in line with GMS objectives & targets.

- ✚ Energy & Water consumption –Though consumption is a function of production volumes, site is committed to reduce it by 5% on year to year basis by implementing various energy conservation projects.
- ✚ Waste Recycling – Site aims to achieve 96% waste recycling target in 2004.
- ✚ Emission of green house gases –This is a function of production volume at the site. However, it will be monitored with strict controls to comply with regulatory norms all the time.
- ✚ COD Release –Site aims 5% reduction in COD load of treated waste water by adopting new technologies.

- ✚ Hazardous waste – Waste oil will be utilized in boiler for generation of steam.
- ✚ Rainwater harvesting – Site aims to harvest the entire rainwater within the factory to the bore wells by 2006.
- ✚ LTI & IR – Lost time injury & illness rate will be brought down to 0.48 from actual 0.36 of 2003.

3. Environmental Management program- For implementation of EMS at Nashik & to achieve EMS objectives & targets following program is in place.

- 3.1 Energy Conservations using lean sigma tools & techniques
- 3.2 Waste minimization - To achieve the target of reduction in waste generation by 15 % & 96% recycling.
- 3.3 Emission of green house gases - To achieve the target of 5% reduction in environmental emissions through stacks
- 3.4 Reduction in ODS emissions
- 3.5 Reduction in organic discharges - Site is having well-designed effluent treatment plant with tertiary treatment facility. All Inlet & outlet parameters are strictly controlled.
- 3.6 Noise Reduction - Nashik has successfully implemented various noise reduction projects thereby improving the working conditions.
- 3.7 Hazardous wastes- Using LS principals of elimination of waste site aims to reuse waste oil generated from machines in to boiler to generate steam. To meet this objective following actions will be taken
 - Trial for burning in boiler
 - SOP for this operation
- 3.8 Rainwater Harvesting – As a corporate citizen concern with natural resources, site aims to harvest rainwater from roofs to increase ground water level.

4. Implementation & Operation

4.1 STRUCTURE OF CORE TEAM RESPONSIBLE FOR EMS

EMS Team Consisting of experts from all the streams is responsible for implementation & control of environmental management program committed by the site.

FUNCTION – This core team formally meet at least once in a quarter. Proceedings of the meeting shall be minuted & minutes of the meeting shall be circulated to other relevant departmental / Section heads as appropriate.

4.2 Training, awareness & competence – Sites training activities are handled through training department. Training is carried out in structured manner with need identification, designing of training modules, class room & on the job training sessions, training

assessment, and feedback, retraining. Training department prepares yearly program for training activities. Latest Standard operating procedure for training is applicable to training department.

4.3 Operational Control – To have operational control on the activities, those are, identified as significant environmental aspects on site & having impact on EMS policy, objective & targets are controlled by standard operating procedures.

4.4 Emergency preparedness & response- Sites Emergency plan & Business continuity plan deals with the nature of emergencies, actions to be taken, facilities available, key personnel identified etc. in details.

5. Checking & corrective actions

5.1 Waste Management- Waste Management Policy – It is the policy of this factory to:

- Provide a system & ensure that wastes generated are identified & managed in a manner, which poses minimum risk to the environment.
- Set up documentation & recording system to provide information about waste type, quantity to enable trends to be monitored.
- Treat local laws & regulations on waste management as minimum standards to be improved upon wherever reasonably practicable.
- Maintain awareness among employees & encourage them proactive participation in waste minimization projects.
- Set priorities & objectives in waste minimization & resource conservation.
- Review new products or processes from waste management point of view.
- Plan & monitor expenses on waste management & control costs while achieving environmental improvements.
- Take full account of waste management consideration as a part of design & for projects/modifications.

5.2 Monitoring & Measurement -Waste management implementation check list –

The objective of this checklist is to provide responsibilities for each of the actions required for management of wastes as outlined in waste management policy so that they are handled in a manner, which poses minimum risk to the environment.

- 5.2.1 Solid waste disposal
- 5.2.2 Hazardous waste disposal
- 5.2.3 Bulk oil & chemical storage -
- 5.2.4 Liquid discharges -
- 5.2.5 Emissions to atmosphere -

5.3 **Handling of environmental non-conformances** - Non conformances in environmental management system if noticed are handled through approved procedures.

5.4 **Records- The following** EMS related records are maintained & their custody is as under,

- Record of wastes-
- Analysis Records-
- Environmental Records

5.5 Environmental Management System Audit -

For effective functioning of EMS, the system is periodically audited for its effectiveness, objectives & implementation. The audit program is governed by latest version of standard operating procedure & authorized audit program available with EHS manager.

6. Management Review-

- In order to comply with company's EHS policy & to achieve objectives, a target set by the organization, environmental management system is reviewed periodically (6 monthly) by the core team responsible for EMS. Results of review are submitted to site head along with recommendations & achievements.