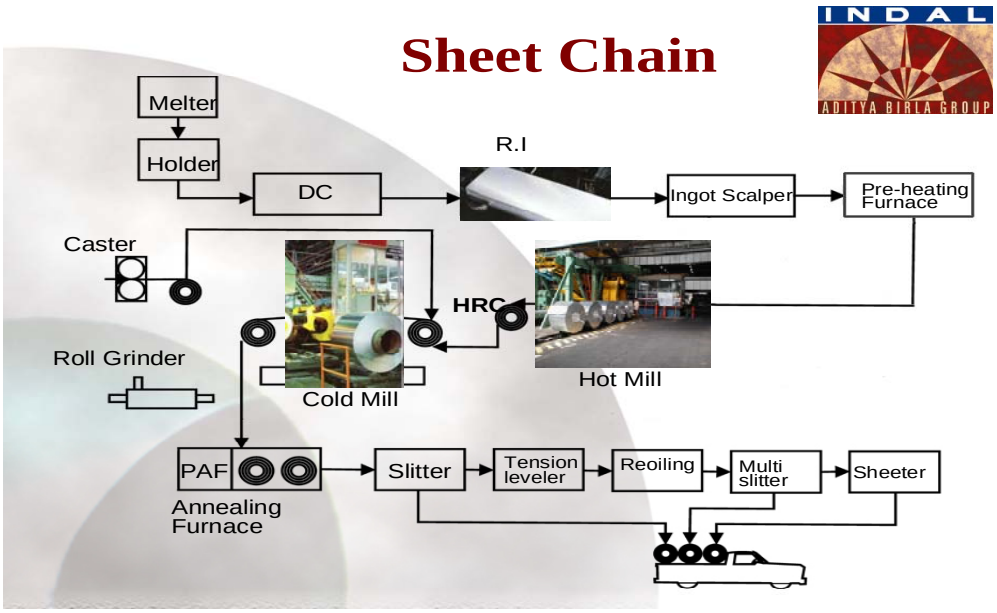
Indian Aluminium Company, Limited
Taloja – Dist : Raigad- Maharastra

Unit Profile

INDAL's Taloja Works – A unit of Aditya Birla Group with an annual sales turnover of Rs. 323 Crores, is located in Raigad District of Maharashtra State, 45 Kms. from Mumbai by road. The Plant with initial investment of Rs.16.6 crores (31% of imported components) was commissioned in November 1971, having a capacity of 11, 500 tons per year of Aluminium rolling. The plant was formally inaugurated on 25th November 1972. Present capacity of plant is 36000 Ton of rolling sheet per year.

The Plant is spread on 62 acres plot. The electrical connected load is 31770 kW fed by 100 KV supply from MSEB through two feeders. The water supply is through MIDC Source.

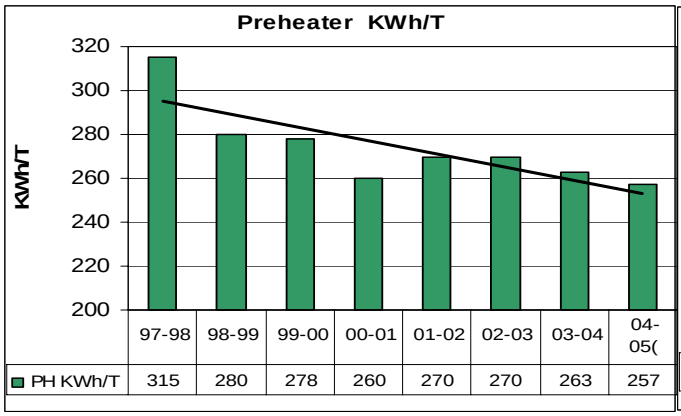
Process Flow Diagram



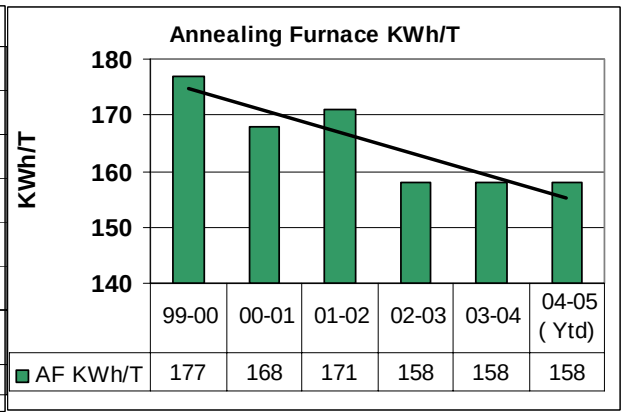
Energy Consumption

Electrical Energy

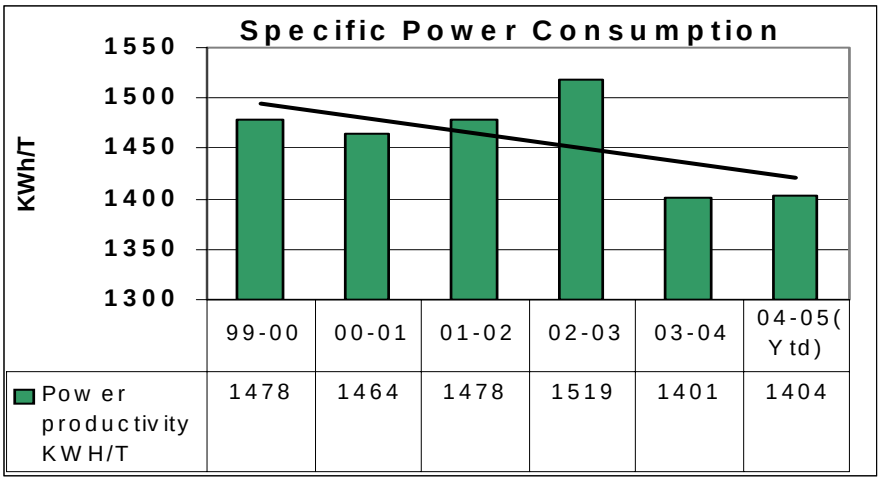
The connected electrical load to the unit is 31770 KW, while the electrical energy consumption is around 51.4 MWh/year. The major electrical energy consuming units are the 4 no. of the preheating furnaces and 4 no. of annealing furnaces. These units consume around 48% of total plant consumption. The three rolling mills together consume about 35% of the total load. The 730 KVA DG set is an emergency energy source. This is operated only during outages of the MSEB power supply to cater to the need of remelting furnaces & recycling plant. The trend is shown separately.



	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05(
PH KWh/T	315	280	278	260	270	270	263	257

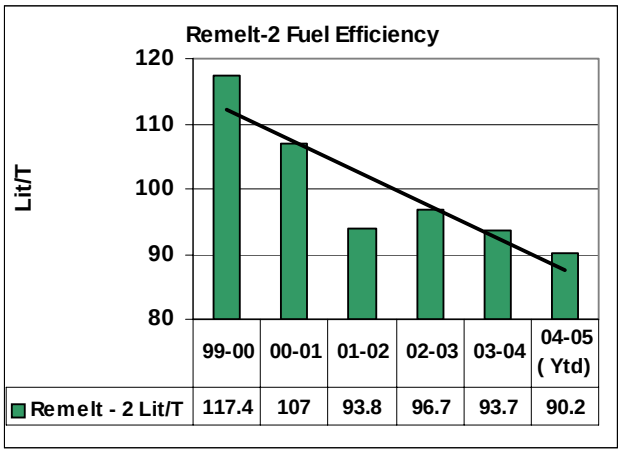


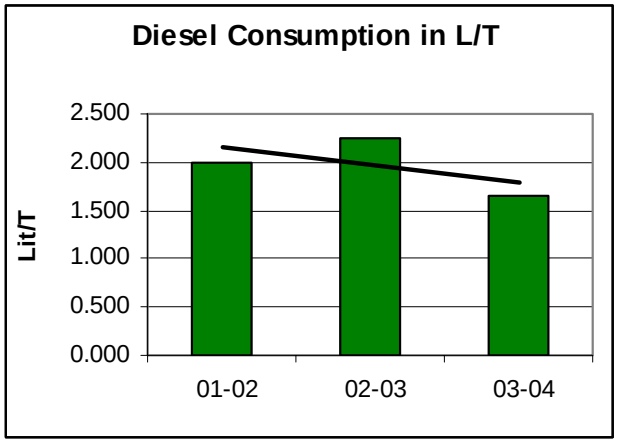
	99-00	00-01	01-02	02-03	03-04	04-05 (Ytd)
AF KWh/T	177	168	171	158	158	158



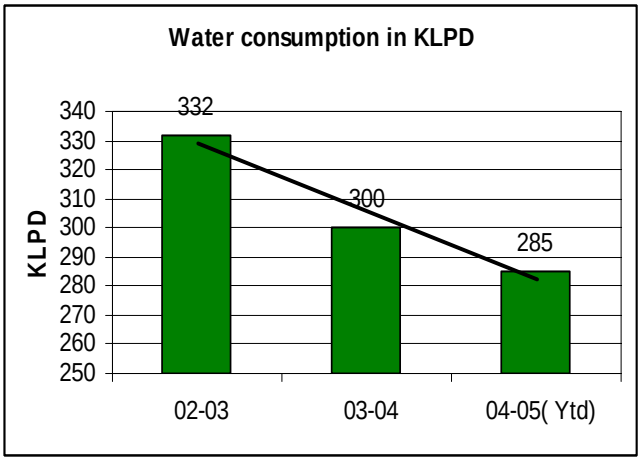
Thermal Energy

Our remelt and recycling furnaces are operated with Low Sulphur Heavy stock (LSHS) oil. The annual consumption is around 6000KL. The oil-fired burners are for melting Aluminum in the furnaces and thereafter rolling ingots being cast for further process.



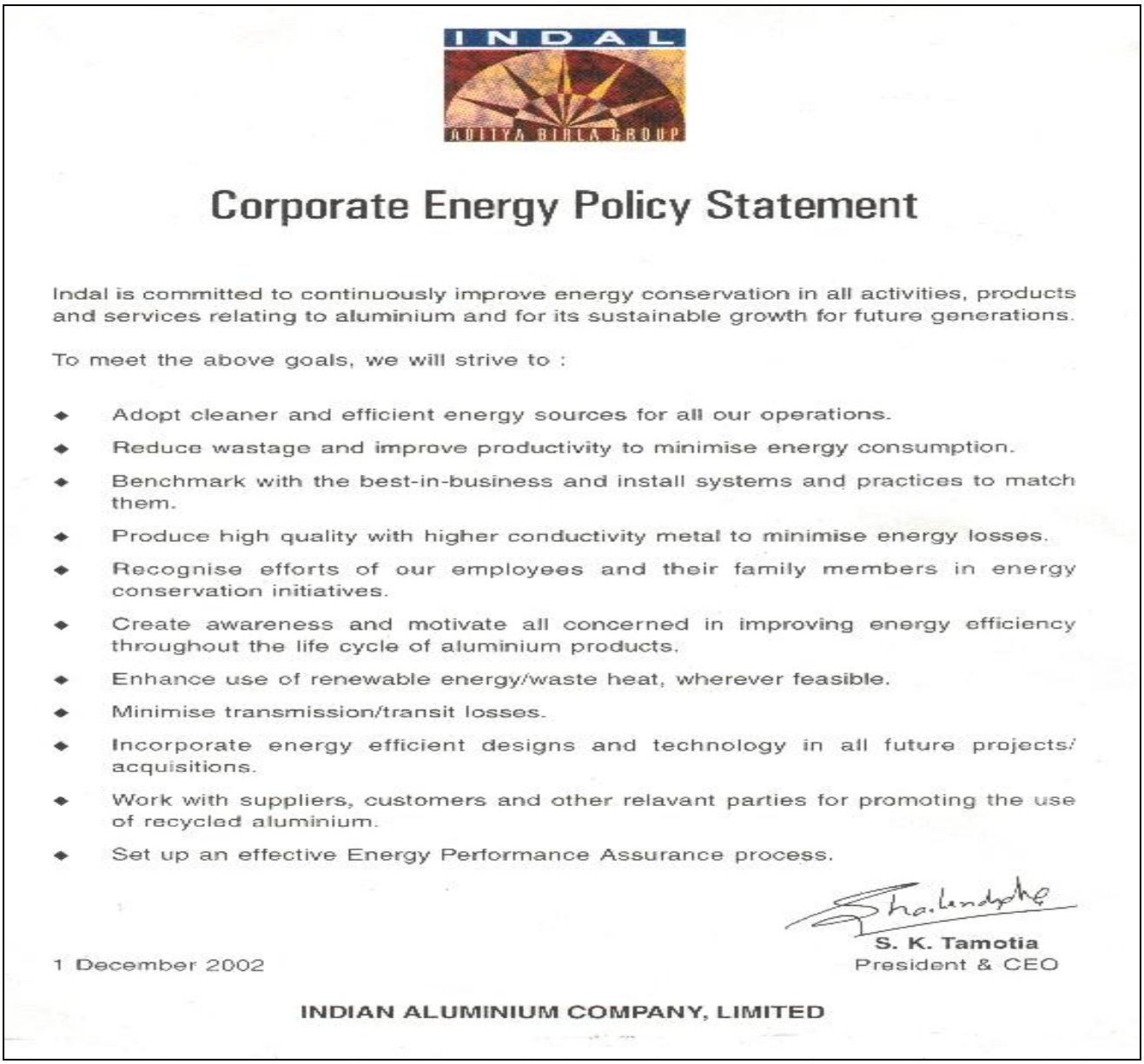


Water consumption:



Energy Conservation Commitment, Policy & Set up.

To strengthen the energy conservation initiatives all across the various process streams starting from mining to foil rolling & packaging, INDAL has devised an energy policy. It is widely practiced at all locations. As far as INDAL – Taloja is concerned, the process itself is an energy intensive one, so it is followed meticulously. We have a dedicated energy cell which drives the energy saving initiative for the plant. Reduction of specific energy consumption is planned through various energy audits, environment management system driven concepts of resource conservation. An yearly plan is made for the projects identified in various audits. The respective area in-charge is made responsible for implementing the project and it is part of his/her personal objective. Centralised energy cell coordinates the process of implementation, reviews, keeps the plant informed of any new concepts implemented any-where else. Furthermore, INDAL Taloja has got a unique concept of Teamwork called POET (Process, Operation and Engineering Team). These autonomous teams are fully empowered to set their objectives in line with company's goal and energy saving initiative is an important part of their team objective. The same is reviewed every month by Vice president (plant)/Chief Executive Sheet Business.



INDAL

ADITYA BIRLA GROUP

Corporate Energy Policy Statement

Indal is committed to continuously improve energy conservation in all activities, products and services relating to aluminium and for its sustainable growth for future generations.

To meet the above goals, we will strive to :

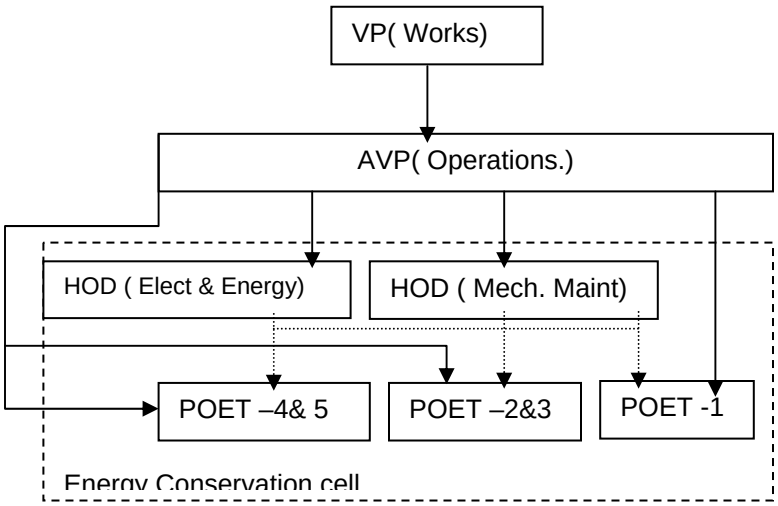
- Adopt cleaner and efficient energy sources for all our operations.
- Reduce wastage and improve productivity to minimise energy consumption.
- Benchmark with the best-in-business and install systems and practices to match them.
- Produce high quality with higher conductivity metal to minimise energy losses.
- Recognise efforts of our employees and their family members in energy conservation initiatives.
- Create awareness and motivate all concerned in improving energy efficiency throughout the life cycle of aluminium products.
- Enhance use of renewable energy/waste heat, wherever feasible.
- Minimise transmission/transit losses.
- Incorporate energy efficient designs and technology in all future projects/ acquisitions.
- Work with suppliers, customers and other relavant parties for promoting the use of recycled aluminium.
- Set up an effective Energy Performance Assurance process.

S. K. Tamotia
President & CEO

1 December 2002

INDIAN ALUMINIUM COMPANY, LIMITED

The organisation for energy cell & review team is shown below.



As we are two and half year old as ISO-14001 certified company, we, Taloja Collective, are fully committed towards Resource conservation through continuous improvement. We have been able to reduce our consumption of electrical energy, consumption in wood, specific oil consumption in remelts, rolling oil, water through Environment management system(EMS). EMS calls for resource conservation on a continuous basis, so we are in our way for achieving different milestones. Our World Class Manufacturing approach further helps in terms of change in work culture and attitude towards resource conservation in totality.

Energy Conservation achievements.

- Total 16 nos of variable speed drives ranging from 7.5 KW to 135 KW are in operation in the plant and few more are in anvil to be installed only for the purpose of energy conservation.
- Total 12 nos of energy efficient motors(2X110KW, 1X90KW, 3X75KW, 1X55KW, 2X37.5 KW,2X22 KW & 1X 7.5KW). As a part of environment management system (ISO –14001), it has become mandatory (provided economically viable) to procure energy efficient motors by d

- Energy inefficient Hot mill fume exhaust blower was changed by a **backward curved design**, highly efficient(78%) blower. The efficiency improved from 37% to 78%. Energy efficient flat belt drive is installed to further improve the transmission efficiency. The earlier blower was run by a 75 HP motor but with improved efficiency, the blower is run by 20 HP motor.

- PLC based automatic control system was commissioned to control the no of compressors in operation as per the plant air requirement, to save energy.
- To optimise the pressure of compressed air supplied to the plant by the 4 no. Kirloskar compressors, so as to reduce the energy consumed by the compressed air system **variable feed control** system was installed. This is in addition to the PLC control and energy efficient motors.

- Regular Thermographic study is conducted for furnace insulation health.
- Aluminum cast blades were changed by FRP blades in axial flow fans(It include 5 cooling tower fans, 30 nos coil cooling fans and 2 nos exhaust fan for cooling chambers)
- Monitoring and optimisation of air fuel ratio to improve combustion efficiency.

List of Energy saving projects completed till Aug'04

		MWh	**kWh/T**
Total energy saving achieved in 2002 - 03		**1075**	**84.35**
Total energy saving achieved in 2003 - 04		**1364**	**131**
Location	**Description**	**Investment (Rs. Lac)**	**Savings (Rs.Lac/year)**
New Remelt	Install VSD for cold water circulation pump	2.00	1.53
Services	Arrest air leakage	0.25	6.26
New Remelt	Capacitors to reduce cable losses	1.58	2.82
Canron	Removal of two stages from the mill supply of Schneider filter.	0.10	5.18
Davy mill	Removal of one stage from the mill supply of Schneider filter.	0.20	3.66
Light cut to length	Install lower rpm motor for stacker blower	0.40	1.08
Roll Grinder	Change mode of agitation in coolant tank	0.40	1.46
Services	Cooling tower fan control - VSD	4.00	3.50
Air conditioners	Install thermostat controls.	0.50	1.04
New Remelt	Replace hot water pumps with correct head pumps	2.00	1.53
Soaking pits	Improve insulation of the top cover with ceramic fiber.	3.00	9.80
Services	Install electronic ballast for TL's	1.40	0.78
Recycling	Reduce heat loss during metal transfer & pouring and otpimise temperature.	1.00	2.65
Services	Avoid day time lighting in the identified areas	0.50	0.73
Hot Mill	Install correct head pump emulsion sump pump	2.50	2.30
CP Compressor	Check the line condition & remove possible blockage to reduce the pressure drop and specific power consumption.	0.10	5.00
HM Fume Exhust Fan	To replace with backward curve fan of 25000 cfm @ 80 mm WC having > 80% efficiency	3.50	4.50
Motors	Replace low efficiency motors by high eff ones.	3.00	5.00
Services	Install energy efficient motor for Kirloskar compressor # 3	1.50	4
Services	Automatic control system for Kirloskar air compressors	2.50	3.2
Davy mill	VSD for fume exhaust fan motor	2.00	1.67
Services	Installation of VFC to control output pressure of Kirloskar compressors	2.00	5.00
New Remelt	Improve combustion efficiency of holder	0.50	2.60

Canron	VSD for Schneider filter oil supply pump	3.50	4.50
Hot Mill	Install correct head pump emulsion feed pump	5.00	3.26
Coil cooling	Replace cooling fan blades by FRP Blades.	1.25	5.14
New Remelt	L/G ratio of 0.34 for the cooling tower is very low; run only one cell in place of two.	0.50	2.61
Mill pump house	Capacitors to reduce cable losses	1.20	2.13
Canron	FRP blade for cooling chamber exhaust fans	0.50	0.88
	Total	**46.88**	**93.81**

Energy Conservation Plans and Targets

- Power Productivity actual was 1400 against target of 1409KwH/T in 03-04. The target for 04-05 is 1325 KwH/T
- Energy audit was carried out by CTC in Apr.'03. Review audit was done in May 04.
- A state of art energy management system has been installed through which the unaccounted loss in HT side could be brought down from 4% to 2%.

Energy conservation projects identified for implementation in current financial year (2004-05) with an overall target saving of 105 Kwh/T

General Services			
1	Plant	Regular surveys to check for compressed air leakage in the plant and reduction	Ongoing
2	CTC	Overhaul the cold water pump for Schneider cooling tower; run with only one pump	Sep-04
3	CII	Convert V belt drives to flat belts for CP compressor	Oct-04
4	CTC	Installation of one pump of 300 m3/hr at 45 head for the mill cooling tower cold water pump.	Apr-04
5	Plant	Reduce the pressure setting of the CP compressors from present 8.5 kg/cm2 to optimum setting	May-04
6	Plant	FRP blade for Schneider cooling tower cooling fan	Aug-04
7	Plant	Zero air loss drain valves for compressed air system	Sep-04
8	Plant	Installation of VFC to control output pressure of CP compressors	Oct-04
9	Plant	Calculate the contribution of General Services to total plant energy consumption and subdivide into fixed and variable part; form separate action plans for each.	Aug-04
10	Plant	Energy efficient lighting for the ware house bay	Nov-04
New Remelt			
1	CII	Improve holder operations to reduce holder fuel consumption	Sep-04
2	CTC	Reduce number of cells in operation in the cooling tower	Oct-04
Canron Mill			
1	CII	VSD for Schneider filter oil supply pump	Nov-04
2	CII	Replace fume exhaust fan with high efficiency fan.	Mar-05
3	CII	Replace motor cooling fan with high efficiency fan.	Mar-05
4	CTC	Replace cooling fan blades by FRP Blades.	Oct-04
5	Plant	FRP blade for the cooling chamber exhaust fans	Aug-04
Davy mill			
1	CII	Convert V belt drives to flat belts for fume exhaust	Sep-04
2	CTC	Replace the motor ventilation fan with backward curve fan of > 80% eff.	Apr-04
Hot mill			

1	CII	Install correct head pump emulsion feed pump	Nov-04
Scalper			
1	CII	High efficiency fan to replace existing fan	Apr-04
Soaking pits			
1	Plant	No load test to be conducted for all the furnaces	Jul-04
2	Plant	Narrow width litho preheating cycle revision - from 615/5hr - 520/7hr to 615/5hr - 500/7hr or 615/5hr - 520/5hr; Trials to be conducted.	Jul-04
Annealing furnaces			
1	Plant	No load test to be conducted for all the furnaces	Jul-04
2	Plant	Insulation revamping of Annealing furnace # 4	Sep-04

Additional plans

- Improvement of PF at General service transformer feeders by Automatic PF control panel and static capacitor installation.
- LPG/LNG gas conversion of electrical heated 1 no pre-heating furnace.
- Measurement of LT power cable losses and its rectification of entire plant was carried.
- Hot mill electrics upgrade from analog control to digital system.

Environment & Safety

We have been accredited as a ISO-9001 - 2000 by BVQI and as ISO-14001 by DNV in 1995 and 2001 respectively, so the commitment from each and every employee towards Quality, Environment management system(EMS) is built in the work culture. Through these systematic approach we have been able to sustain our market share. Through EMS we have reduced consumption of wood, rolling oil, water, electrical energy, specific oil consumption in remelts etc.

- Ours is an ISO 14001 and we strive to achieve better resource conservation and pollution prevention.
- Resources like water, energy, fuel, wood conservation methods are undertaken as operating cost initiative.
- All aspects related to our operations were identified and tested for their significance as per the criteria.
- Zero Leakage initiative has been taken all across plant for conservation of lubricant, hydraulic oil and water.
- 20 nos. of Environment Management Programs (EMP's) with time bound action plans are in place for all identified significant aspects and other aspects are taken care through Operational Controls (OC).
- These EMP's and OC's are being tracked through EMST & MRC meetings.

To further improve our safety management system, we have been also certified as OHSAS – 18001(Occupational Health and Safety Assessment Series) by M/s DNV.

- As a OSHAS 18001 certified company, we continuously work towards making our workplace a better work place w.r.t less occupational health & safety hazards.
- All hazards related to our operations were identified and tested for their significance as per the criteria.
- 25 nos. of Occupational Health & Safety Management Programs (OHSMP's) with time bound action plans are in place for all identified significant hazards and other hazards are taken care through Control Measures
- These OHSMP's and Control Measures are being tracked through EMST & MRC meetings.
- Electrical department has prepared an integrated functional manual which has become a benchmarked document for DNV auditors to refer.
- We have integrated both EMS & OSHAS so that single team, meeting, reviews and audit can take place effectively

Being a unit of Aditya Birla Group, we have adopted a holistic approach for manufacturing excellence and selected for participation in Chairman Award for Manufacturing Excellence within the group companies and awarded bronze medal for the same in 02-03. We have been assessed for Gold award for the same category during 04-05.