



Grasim Industries Limited

Plant Profile

CEMENT
DIVISION -
SOUTH

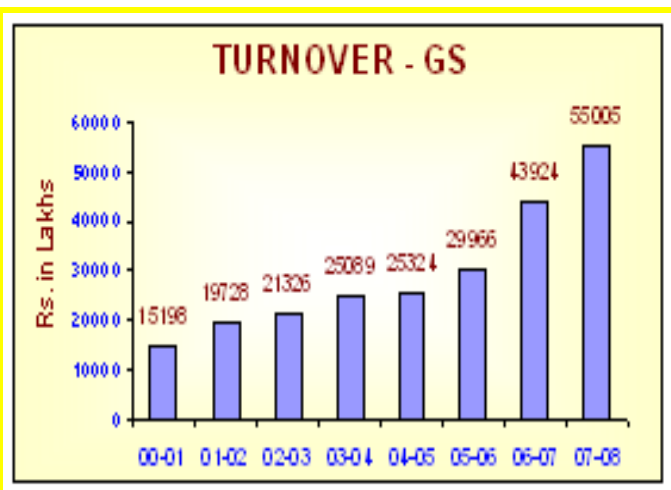
ORGANISATION DESCRIPTION

BUSINESS

Grasim Industries Limited has ventured into the cement business in early 80s with the first plant in Madhya Pradesh (Vikram Cement). Within a span of 22 years it has increased its production capacity to 37 million tonnes per annum (MTPA) by expansion mergers and acquisition. Presently Grasim is the largest cement producer in the country and the 8th largest in the world. As of now, Grasim, after taking over the cement business of L&T (presently known as UltraTech), has its cement plants spread over in the country with 11 clinker and cement production units with additional grinding units and Ready Mix Concrete (RMC) units at various strategic locations.

Grasim Industries Limited (Cement Division - South) is the millennium plant in the cement business with an installed capacity of 2400 tonnes per day (TPD) which was commissioned in the year 2000 and known as the Millennium plant. Over a period of last few years it has optimized its capacity to 2900 TPD by 2004 and further to 3250 TPD in the year 2005 by up-gradation and de-bottlenecking.

By the year 2003 itself, the plant was certified for ISO 9001, ISO 14001 and OHSAS 18001.



The major products of **Grasim South** during the time of installation were Rajashree cement (OPC 43 grade) and Ultratech (OPC 53 grade) cement. However with the increased production of blended cement in the country, particularly in southern region, Grasim South has also increased its market share of blended cement which is predominantly PPC (Portland Pozzolona Cement) to around 74% by the end of 2007-08 (2005-06 yearly average: 48.42%). The brand of cement which is more popularly known as Ultratech cement in the country is today produced from all the units of its cement business including Grasim South. In the year 2000 the cement business of Grasim has split into Manufacturing and Marketing divisions with Chief Manufacturing and marketing Officers heading both divisions reporting to the Business Head



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MAJOR TECHNOLOGIES, EQUIPMENT AND FACILITIES

Grasim South being the millennium plant has been endowed with all the latest technologies available at that point of time. The original plant was supplied by Fuller (which is a part of FLS since last 4 years). It has 4 stage pre-heaters with pre-calciner and latest generation cooler for clinker cooling. For the control of cement and clinker quality the plant is outfitted with a variety of expert systems like:

- RoboLab – only cement plant in India till today.
- Gamma Matrix (CBX -Crass Belt Analyser)
- Raw Mix Package (RMP)
- Laboratory Information Management System (LIMS)
- Knowledge Manager - for the first time in India.
- Linkman optimization operation software
- Plant Control & Automation package – from M/s. ABB Switzerland



RoboLab

The latest addition is the most articulated Process Information (P.I) software which is a unique software to facilitate accessibility to all the operational people as well as concerned people at distant location like other group units and corporate office to the operating parameters and other important information. Similar system has been installed in all Group units of cement business to have ease of access to data which can be utilized for efficient operation of the plants.

In addition to the above, the plant has adopted modern technology for raw meal grinding, cement grinding etc., such as Vertical Roller Mills (from Loesche, Germany) and Cement Mill with roller press and V-separator (from KHD, Germany).

REGULATORY ENVIRONMENT

The Plant has been installed with all the most up-to-date technology available in the field of pollution control and considering future environmental regulations. For example ESPs (Electro Static Precipitator) are installed at all critical locations with latest EPIC controls supplied by ABB. All this results into very low emission level at different stacks in the plant which is reproduced below.

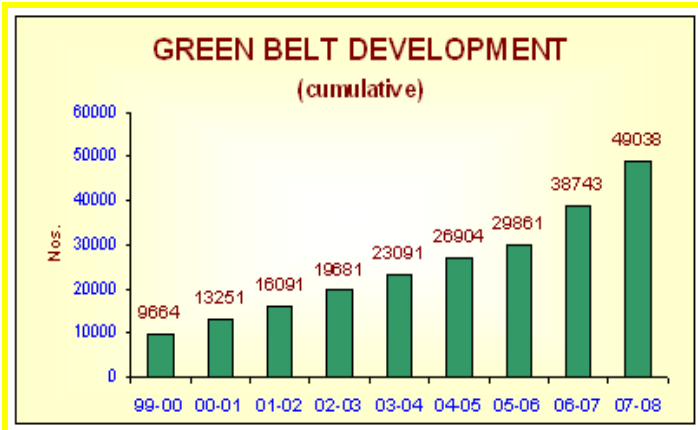
Emission Level: (2007-08)

Raw Mill ESP	=	38.65 mg/Nm ³
Cooler ESP	=	36.63 mg/Nm ³
Coal Mill ESP	=	32.51 mg/Nm ³
Cement Mill Bag Filter	=	33.57 mg/Nm ³

As against statutory
limit of 40 mg/ Nm³

Right from the inception, the Management was very particular about the plantation and meticulously designed the same to make the plant environmental friendly. In the mining area, Grasim South has totally eliminated the drilling and blasting technology which is a conventional system of mining involving unsafe condition to the workmen and surrounding inhabitants. Grasim South has obtained most modern

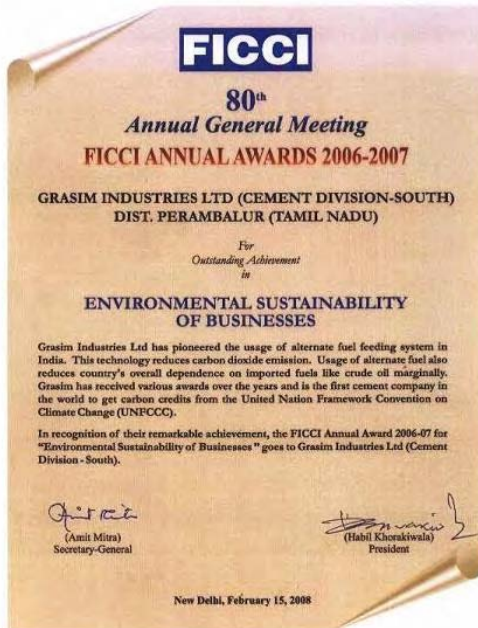
scientifically made Ripper - Dozer from Komatsu, Japan, for mining operation. This is ecological friendly equipment which eliminates the air pollution, sound pollution, vibration etc as well.



Captive Power Plant (CPP) - In the year 2003, Grasim South has installed captive Thermal Power Plant of 12.5 MW capacity to cater to the need of energy consumption in the cement plant. This reduces the power cost substantially as the state grid power supply has been disconnected after commissioning the CPP as a result of which the power cost has come down to 50% with the use of 100% captive power.

Safety - Grasim South has an excellent record with regard to safety measures. There is even no reportable accident for the last two consecutive years. The management is giving extra focus to accomplish Zero accident. Because of this excellent track record Grasim South has bagged many an awards like:

- ✚ Global Cement Awards, London – Year 2006. (Lowest Injury Incidence Rate – First prize) [1000\$].
 - ✚ GreenTech Safety Bronze Award in 2006 & Silver in 2007.
 - ✚ GreenTech Environment Excellence Award – Silver for 2006 & 2007
 - ✚ State Energy Conservation Award – 2007 (Second Prize)
 - ✚ FICCI Award (Environmental Sustainability of Business – 2006-07)
 - ✚ TamilNadu State Safety Award 2005 (Two First Prizes), received on March 25th 2008
 - Scheme II - Lowest weighted Frequency rate during the award year when compared with other industries coming under the same classification and same group.
 - Scheme III - Longest Accident Free period in man-hours during the award year
- CII National Award for Excellence IN Energy Management -2005,2006,2007 & 2008.



FICCI Award
(Environmental Sustainability of Business –
2006-07)



FICCI – Outstanding Achievement of Environmental Sustainability of Business Award – 2006-07. This Award received by Mrs. Rajashree Birla from Dr. Man Mohan Singh, Honorable Prime Minister of India during the FICCI 80th AGM on 15.02.2008 at New Delhi

In addition to the above, Grasim South has been complying with all the statutory requirements of electrical, mines, ground water etc. Grasim South is also maintaining a congenial relation with the surrounding villages.

Due care is given in identifying, assessing and controlling occupational health by administering periodical health check for all employees including Audiometric tests for Mines workmen etc. In order to ensure safe working, Personnel Protective Equipments (PPE) are provided to all employees. The PPE includes shoes, helmet, face shield, ear muff / plug, respirator, goggles, gloves, apron, safety belt etc. as per the job requirements.

With the objective of zero accident and to inculcate safe work culture, regular class room and on-the-job safety training are organized, which include: Industrial Safety training (monthly), First Aid training (twice in a year) and Fire fighting training (twice in a year).



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Safety Week Celebrations – Annual event to create awareness:
Activities include: Safety Play, Song, Essay, Slogan etc.

Fire fighting demonstration in the
Safety Awareness meeting

Rural Development - Grasim South, in line with the corporate philosophy of developing the rural areas around the Industries, has also ventured into different kind of activities in the surrounding villages.

Following are key focus areas of interventions for community taken up by the Unit:

- Sustainable Rural Livelihoods
- Drinking water
- Sanitation
- Health & Hygiene
- Infrastructure Development
- Education
- Health Education
- Social Welfare Activities
- Relief & Rehabilitation

Working Culture - Grasim South has a team of employees with an average age group of 35 years. This young team of personnel creates a very good working atmosphere with high degree of integrity, positive attitude, seamless working and very good communication across different disciplines. This good working culture of the employees has helped the Unit to stabilize the operation in a very short period of time and also bagged many awards and accolades in the field of productivity, quality, safety, environment, rural development etc. The relation between the management and workmen remains very conducive ensuring no industrial unrest so far. The workforce is very dedicated resulted into increased individual productivity.

Values - Grasim South was one of the first Units in the group which inculcated the group values to all its staff members in a shorter period of time. Commitment of the employees is evident from the start of their working where they have Morning Prayer emulating the group values and pledging for zero abnormalities, zero accident, zero breakdowns, zero complaints, zero pollution and zero losses.

Grasim South has been practicing the 5 values wholeheartedly since long i.e. much before the stimulation of the same by our Chairman. Winning of the WCM Chairman's Bronze and Silver award for manufacturing



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excellence in consecutive years indicates the team work, commitment, seamless working etc., put up by the whole organization.

Installation of waste fuel feeding system and continuous endeavour by the employees for the utilization of alternate fuel and the registration of CDM (Clean Development Mechanism) project for usage of alternate fuel talks about the speed of the employees in the Unit. It is because of their passion and speed that the Unit has been the first plant in the country to establish the usage of alternate fuel thereby reducing the cost of fuel substantially and also getting the same registered as CDM project.

Our Vision

“Be the best in the cluster for quality, cost and enhancing customer, employee and other stakeholder value by 2008.”

Our unit follows Common Management Systems Policy which covers of QMS, EMS & OHSAS systems requirements

MANAGEMENT SYSTEMS POLICY

We are committed to develop, implement & continually improve our management systems for Product Quality, Optimum Resource utilization, Environmental protection, Occupational Health & Safety and Ethical governance for satisfaction of Customers and interested parties.

Pursuant to this goal, with the involvement of all employees, we shall

- Supply consistent quality of clinker & cement as per mutually agreed terms.
- Monitor, control and upgrade technology, processes and operational practices.
- Prevent pollution, conserve energy & natural resources, manage waste effectively and create a safe working environment.
- Identify, assess & control significant Environmental Aspects, Occupational Hazards and Risks.
- Comply with all applicable system standards, legislative, regulatory and other requirements.
- Create awareness amongst all interested parties through consultation & communication and care for their concerns and welfare.
- Develop mutually beneficial relationships with suppliers and encourage them to adopt the principles of Management Systems.
- Enhance competencies of employees to develop a stronger & competitive organization.
- Participate, involve & contribute to social & economical development of the surrounding communities.

Unit Head

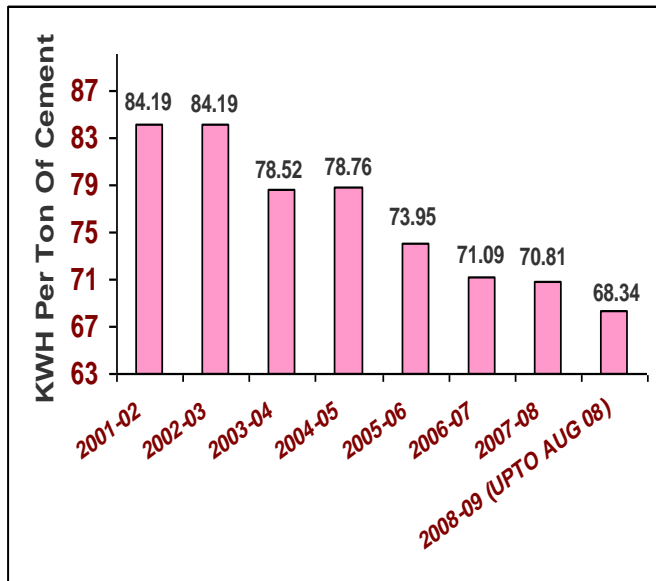
ENERGY MANAGEMENT POLICY

- We at Grasim Industries Limited (Cement Division – South) are committed to evolving and sustaining excellence in energy conservation to reduce cost of production & improve environment.
- We will work continuously to conserve energy and achieve world benchmarks in terms of energy consumption in our process.
- Fostering a culture of participation and innovation amongst employees for continual improvement in energy conservation.

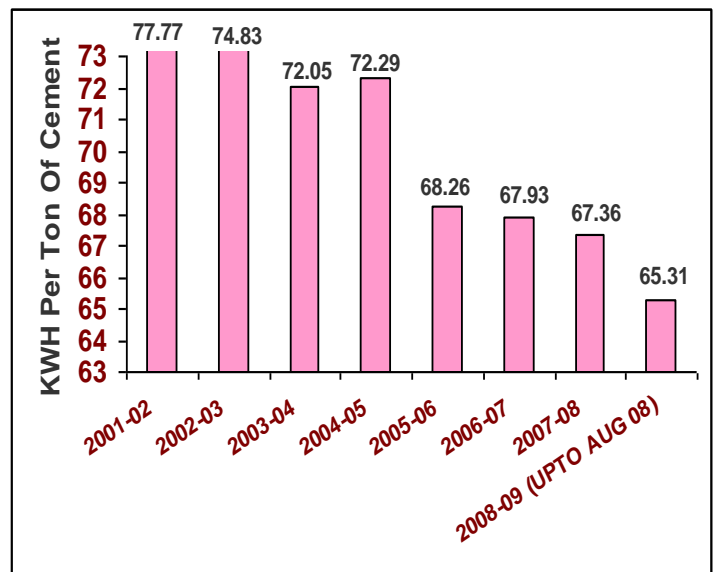


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ENERGY CONSERVATION ACHIEVEMENT REDUCTION IN SPECIFIC POWER CONSUMPTION

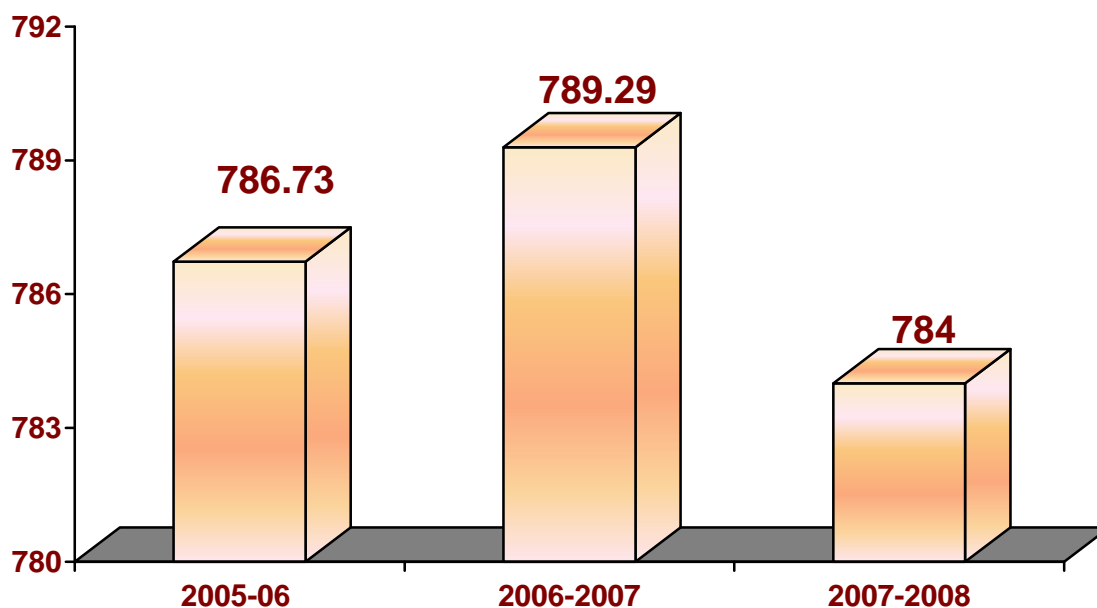


(OVERALL POWER)



(OVERALL POWER FOR PPC)

SPECIFIC FUEL CONSUMPTIONS IN KCAL/ KG OF CLINKER





1. INNOVATIVE PROJECT-KILN

Tipping of preheater fan impeller
(Impeller dia. Increased by 2.5
%).

BENEFITS:

Increase in fan flow and Reduction in
Power Consumption.

INVESTMENTS

5.5 Lacs



2. INNOVATIVE PROJECT-KILN

Installation of high efficiency
cooler vent Fan

BENEFITS:

Fan efficiency increased from 40% to
60 % and Power Saving of 37 KW/hr.

INVESTMENTS

40 Lacs





3.INNOVATIVE PROJECT- KILN

Installation of higher capacity Cooler fan 471 FN1

471 FN1 Cooler fan replaced with high efficiency fan (Fan Motor changed from 135KW to 124 KW.)

Savings:

Power savings 11 kw/hr
(Rs290330.20/annum)

INVESTMENTS

14 Lacs



4.INNOVATIVE PROJECT

Installation of High efficiency Raw mill ESP Fan

Raw mill ESP fan changed with high efficiency fan to remove Process bottleneck (Fan flow increased from 4.6 Lacs m³/hr to 5 Lacs m³/hr)

Savings:

Power savings 120 Kw/hr
(Rs 31.67 Lacs/annum).

INVESTMENTS

50 Lacs





5.INNOVATIVE PROJECT- KILN

Installation of higher capacity Cooler fan 471 FN2

471 FN2 Cooler fan replaced with high efficiency fan (Fan Motor changed from 115 KW to 105 KW.)

Savings:

Power savings 10 kw/hr
(Rs263936.50/annum)

INVESTMENTS

14 Lacs



6.INNOVATIVE PROJECT- KILN

Replacement of Reciprocating compressors by Screw compressor

Four numbers of Atlas Copco make Screw compressors were installed in place of reciprocating compressors in preheater and cement mill sections.



Savings:

- 1.Power saving of 90 Kw /hr (23.72 Lacs/annum)
- 2.Reduction of Noise and Reduction in water consumption.



7.INNOVATIVE PROJECT- KILN

Installation of higher capacity Cooler fan 471 FNA

471 FNA Cooler fan replaced with high efficiency fan (Fan Motor changed from 57 KW to 51 KW.)

Savings:

Power savings 6 kw/hr
(Rs 158361.90/annum)

INVESTMENTS

14 Lacs



8.INNOVATIVE PROJECT-KILN

Installation of High Capacity Clinker breaker for cooler

BENEFITS:

Increasing the availability of cooler.

INVESTMENTS

56 Lacs





9. INNOVATIVE PROJECT-RAW MILL

Installation of High efficiency Raw mill Fan

Raw mill fan flow capacity enhanced from 3.03 Lac m³/hr to 3.70 Lacs m³/hr. of 76% and fan efficiency increased from 76% to 84%.

Savings:

Power savings 60 Kw/hr
(Rs 15,08032.80/annum)

INVESTMENTS

57 Lacs



10. INNOVATIVE PROJECT-RAW MILL

REDUCTION OF POWER CONSUMPTION IN RAW MILL

DESCRIPTION

To reduce the power consumption of Raw Mill circuit, a detailed study was done by analyzing the pressure drop, measurement of air volume and velocity calculation at different

locations of Raw mill duct. High pressure drop from Preheater Outlet to Raw Mill Inlet "Around 160 mmwg" and also the velocity in inlet duct was 26 m/sec. After modification of the duct, reduction in pressure drop was 136mmwg and velocity 18 m/sec .

INVESTMENT: 129.75 Lac





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12.INNOVATIVE PROJECT-CEMENT MILL

INTERCONNECTION LINE MADE BETWEEN PYRO AND CEMENT MILL AIR RECEIVER.

DESCRIPTION :

Efficiency of Screw compressor is high but unloading power is low as we are using different capacity compressors. It was decided to combine different capacity compressors to operate according to our plant air requirement.

150NB interconnection line provided between Pyro & Cement mill Air-receivers.

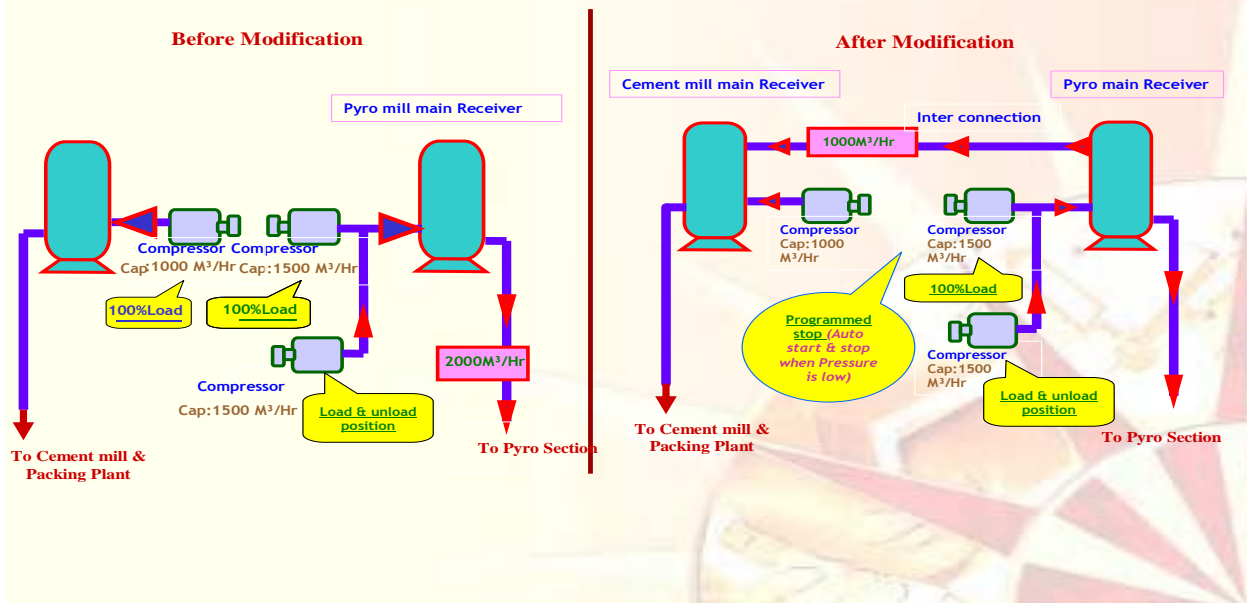
INVESTMENT: 3.12 Lacs

SAVINGS: Rs 5.61 Lacs/annum

R.O.I: 6.5 Months



12INNOVATIVE PROJECT-CEMENT MIL





13.INNOVATIVE PROJECT-CEMENT MIL

CONVERSION OF TWO STAGE COMPRESSOR (K51 CP1) INTO SINGLE STAGE COMPRESSOR

DESCRIPTION :

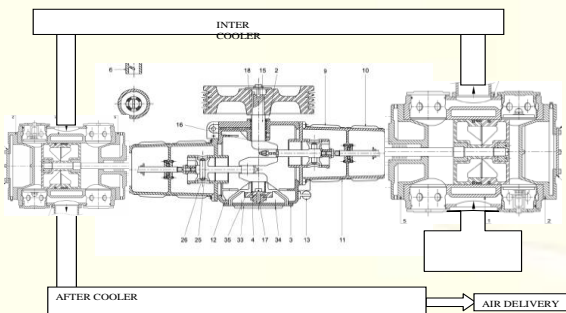
For reducing flyash unloading pressure and power consumption per unit ton of flyash, 180 mm dia HP side cylinder removed and one more 310 mm dia LP Cylinder fixed with separate suction and delivery arrangement.

The capacity of the compressor increased from 860 m³/hr to 1500 m³/hr.

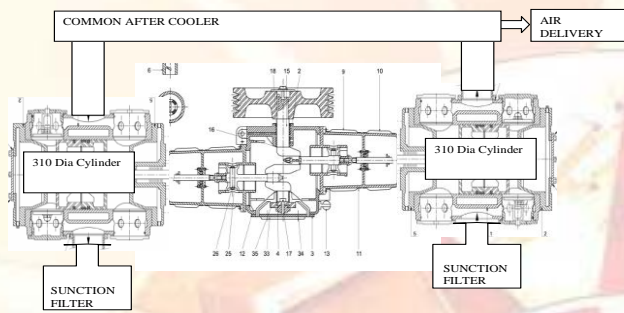


13.INNOVATIVE PROJECT-CEMENT MIL

BEFORE MODIFICATION



AFTER MODIFICATION





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13. INNOVATIVE PROJECT-CEMENT MIL

CONVERSION OF TWO STAGE COMPRESSOR (K51 CP1) INTO SINGLE STAGE COMPRESSOR

SAVINGS:

Savings(Rs.Lacs) Average Flyash unloading /day :600 Ton.

Saving per Ton :0.75 unit.

Saving per day :450 units.

Cost savings per year :4.2 Lacs.

Approximately ROI Period :5 months.

72



15. INNOVATIVE PROJECT-PP

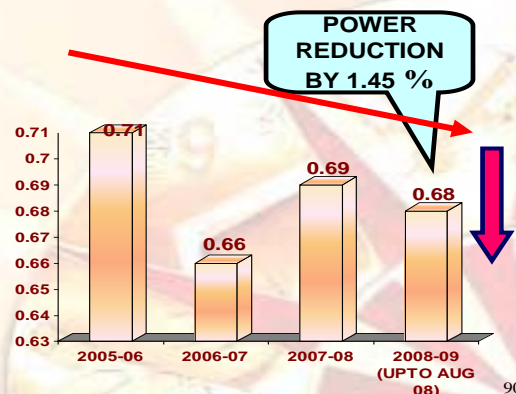
Installation of high efficiency impeller for Packer bag filter

Replaced high efficiency impeller for Packer bag filter Fan, thereby reduced the motor rating from 75kw to 37 kw.

Savings:

Power savings 22 Kw /hr
(Rs 579189.90/annum)

KWH/TON OF CEMENT



90



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16. INNOVATIVE PROJECT-LS

Installation of Cross Belt Analyser

BENEFITS:

Consistency in Raw Mix

INVESTMENTS

222 Lacs



OTHER MAJOR INITIATIVES TAKEN FOR ENERGY CONSERVATION DURING THE YEAR

2007-08

PROJECTS WITHOUT INVESTMENT

Savings for 2007-2008.				
Sl.No.	Title of energy savings project implemented	Year of implementation	Annual Savings	
			Savings /Year in million units	Savings /Year in million Rupees
1	Compressor air Optimisation & one compressor stopped permanently.	2007	0.272	0.8774
2	Raw mill & cement mill start/stop timing optimization from CCR.	2007	0.003	0.0096
3	Maintaining 120 degree centigrade temp at Cement mill clinker weigh feeder.	2007	1.25	4.037
4	Study & Optimisation of Limestone reclaimers & belt conveyor running time.	2007	0.008	0.0258
5	Reduction of operating pressure in flyash Compressor.	2007	0.017	0.054
6	Review & optimisation of coal firing bag filters in Coal mill.	2007	0.008	0.02584
7	CCR AC AHU timing to be optimised from 7 am to 7pm.	2007	0.008	0.02584



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Savings for 2007-2008.

SI.No.	Title of energy savings project implemented	Year of implementation	Annual Savings	
			Savings /Year in milion units	Savings /Year in million Rupees
8	Installation of Control switch to switch off alternate lighting in packing plant long belt area.	2008	0.007	0.02261
9	Raw mill main drive cooling fan to be interlocked.	2008	0.048	0.15504
10	Kiln Forced lubrication system pumps made operative as per requirement.	2008	0.024	0.07752
11	Interlocking has given for sampler in cement mill.	07.02.08	0.001	0.00323
12	Interlocking of bag filter purging time with fan in fly ash system.	07.02.08	0.003	0.00969
13	Optimization of HP fan running time at cement mill silo Top.	07.02.08	0.013	0.04199



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Savings for 2007-2008.

SI.No.	Title of energy savings project implemented	Year of implementation	Annual Savings	
			Savings /Year in million units	Savings /Year in million Rupees
14	Silo Top Bag filter speed reducing by auto mode if Raw mill stops.	2007	0.006	0.01938
15	Replacement of Kiln ESP RAL's for False air arrest.	2007	0.007	0.02261
16	Lime stone weigh feeder blaster operation with feed deviation.	2007	0.002	0.00646
17	Fixing of Exhaust fan in Crusher venting line.	2007	0.004	0.01292
18	Replacing double stage compressor with single stage in Packing Plant.	2007	0.03	0.0969
19	Optimisation of coal mill ESP KV.	2007	0.204	0.65892
20	Installation of 45W CFL fitting in place of 150w HPSV fitting.	2007	0.008	0.02584



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Projects with investment

SL NO	TITLE OF ENERGY SAVINGS PROJECT IMPLEMENTED	YEAR OF IMPLEMENTATION	ANNUAL SAVINGS		INVESTMENT MADE
			UNITS MILLION	RS MILLION	RS MILLION
1	Retrofitting of cooler vent fan for high efficiency for saving of power 37 KW and increase the efficiency from 40 % to 68 %.	2006	0.2769	0.77	11.06
2	Reducing power consumption by Re-engineering of Raw mill inlet ducting for reducing pressure drop by 136 mmwg and raw mill fan power also reduced by 266 KW.	2006	1.97	6.062	145.5
3	Installation of separate switch for coal stacker and reclaimer in MCC room.	2007	0.0007	0.001737	0.0005
4	Interlocking provided for roller press P & V blower with roller press motor.	2007	0.004176	0.01044	0.001
5	Local control switch provided for L21 BC7 tower lighting.	2007	0.002942	0.009504	0.001
6	Segregation of lighting in long belt area in packing plant.	2007	0.009075	0.027225	0.005
7	Power saving through interlock for LS reclaimer PCRD motor during pile change.	2007	0.00414	0.010267	0.002



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ENERGY CONSERVATION PLANS AND TARGETS

Sr No	Description (Nature of Capex)	Investment (Rs. lakhs)	Savings in Lacs/Annum	
			Power (Gross)	Total (Net)
1	SPRS for PH Fan	86.00	20.39	20.39
2	Upgradation of separator / fan with higher efficiency .	70.00	6.24	78.69
3	Centralised microprocessor controlled SX system for compressor	15.00	6.24	6.24
4	Raw mill fan SPRS Upgradation	65.00	5.00	5.00
5	Upgradation of Bag filter fan Impeller (Cement mill) with higher efficiency	30.00		
6	Wind mill	6000.00		4466.67
7	5th stage cyclone	2000.00	45.42	891.63
8	Cooler heat recovery system for drying fly ash.	50.00		
9	GCT Pump replacement with high efficiency pump	4.00	5.00	5.00
10	Installation of Low head GCT Pump	3.00	3.00	3.00

ENVIRONMENT & SAFETY:

The Unique features of our Unit towards Safety, Health & Environment are:

- ISO 9001
- ISO 14001
- OSHAS 18001
- Corporate Safety Environment Cell, Mumbai: Safety Audit and Feedback.
- National Safety Council, TN Chapter, Chennai Safety Audit and Compliance
- Inter Unit safety Audit amongst all Cement Plant of Aditya Birla Group once in Six Months.
- Learning for Safety & Environment through Exchange of reports between group plants, to take proactive action for zero accidents.
- Usage of alternate fuels
- Usage of Hazards wastes after successfully trail run.

Environment Initiatives:

- Plant with latest environment protection systems like ESP's, Bag Filters and Dust Collectors
- Concrete roads throughout the plant to prevent fugitive emission.



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- Construction of drains & ponds for storm water management.
- Construction of dyke wall for all oil storage tanks
- Rain water harvesting for replenishing the water table.
- To consume water, reversible osmosis plant is installed in Thermal Power Plant and recycled water is used for horticulture.
- Mines water is pumped to villages for irrigation purpose.
- Green belt development in the plant and colony.

Membership with safety promotional institutions:

- a) NSC membership
- b) LPA membership

Safety Awards won by organization:

1. National Safety Council (Tamilnadu Chapter)
2. Other State Level Awards
 - ✓ State Safety Awards for the year 2000 & 1999 for our Unit II, we won three numbers of first prize and two numbers of second prize given by Govt. of Tamilnadu at a function held on 31.03.03 at Chennai by Hon'ble Minister for Labour.
 - ✓ Trichy Zone Class A Mines Inspection face working condition of face machinery conventional method of mining. Won first prize in the year 2002. Award issued by Director General of Mines Safety, Southern region, Govt. of India.
 - ✓ Workers participation in Safety Management II Prize in the year 2002.
 - ✓ Personnel protective equipment III prize in the year 2002.
 - ✓ Zonal & State Level Mines Safety Week Celebrations 2003 - won seven awards.
 - ✓ Won CII commendation award in SHE PERFORMANCE 2003.
 - ✓ Tamil Nadu State Safety Award 2005 (Two First Prizes), received on March 25th 2008
 - ✓ Scheme II - Lowest weighted Frequency rate during the award year when compared with other industries coming under the same classification and same group.
 - ✓ Scheme III - Longest Accident Free period in man-hours during the award year

ENVIRONMENTAL INITIATIVES:-

- ✓ Trial run has taken for different types of hazardous waste in presence of CPCB and TNPCB .
- ✓ Clinker loading chute and accessories for tippers during loading avoiding the heavy dust generation and spillage.
- ✓ Ripper Dozer is being used for Mines operation which is ecofriendly and total avoidance of drilling and blasting.
- ✓ Alternate Fuel Storage Shed For Systematic Storage Of Different Fuels In Closed Shed Ecofriendly.
- ✓ SOX & NOX Analysers in thermal power plant.
- ✓ Increase in GCT Height in order to reduce the dust emission in raw mill stack by improving the efficiency of electro static precipitator.
- ✓ High Efficient auto tuning EPIC -2 controllers are installed in all ESP's.
- ✓ Limestone transport vehicles are being covered with Tarpaulin and Emission certificate.



Covered clinker silo



Covered Coal yard



Covered Limestone yard



Road Sweeping Machine



Ripper & Dozer for Mines operation



Closed covers for Conveyors



Concrete roads in Plant



Environmental day - tree plantation



RO plants at Power Plant



DG sludge collection point

CONVENTIONAL FUEL CONSERVATION

- A mechanized alternate fuel feeding system installed first time in india.
- Trial run conducted with agricultural waste -consumption upto 20%.
- Trial run taken under the supervision of TNPCB, CPCB for various industrial hazardous wastes (upto 20%) like
 - Tyre
 - Refinery & Oil sludges
 - Paint sludge



% OF ALTERNATE FUEL IN KILN ON CV BASIS

