

RAMPURA AGUCHA MINE - HINDUSTAN ZINC LIMITED

Agucha Mines, Bhilwara (Rajasthan)

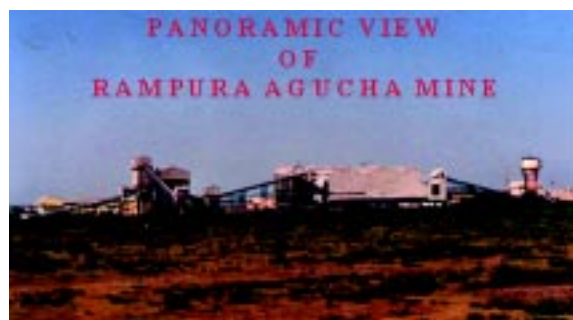
Unit Profile

The Rampura Agucha Mine is situated 15 km. South-east of Gulabpura and 220 km. South-west of Jaipur, in the district of Bhilwara, Rajasthan. It is a world class deposit - with the estimated geological reserve of 63.648 milion MT at the geological grade of 13.54% Zinc and 1.97 Lead - owned by M/s Hindustan Zinc Ltd., Yashad Bhawan, Udaipur - 313004, Rajasthan, India.

R.A. Mine was commissioned in 1991 for the designed capacity of 3000 TPD ore production and it's beneficiation. Same has been expanded to 4500 TPD in 1998. Further expanded for enhanced capacity to 11400 TPD in 2005.

Business activity at R.A. Mine involves mining of Lead Zinc composite ore by highly mechanized open pit method, with the help of heavy earth moving machinery (HEMM) and its beneficiation in a state of the art captive plant by froth floatation method to produce quality Lead and Zinc concentrate separately for using at the own Smelters or sale / export. Major departments are Mining, Mill(Ore Dressing), Electrical, Central Work shop, Personnel & Administration, Finance, Materials, Civil, Medical etc.

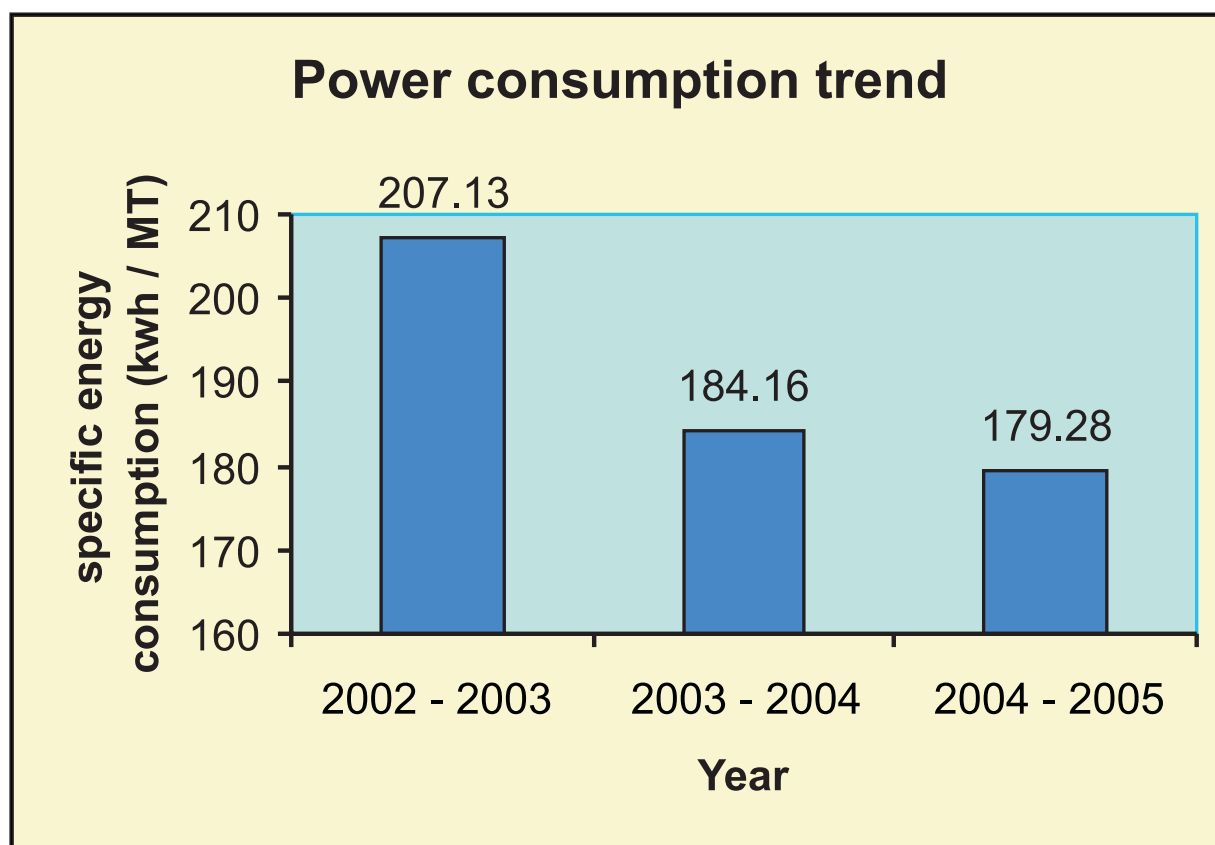
The Mine & Mill operates round the clock in three shifts of 8 hours duration each. Mine is managed by a team of dedicated professionals, committed to the management of environment, health and safety (EHS). The total strength of highly skilled and dedicated departmental work force is 702 only (Executives-125 + Workmen -577). Besides above, on an average 200 to 250 employees also find employment daily under various contracts in the mine. Initial and periodical medical examinations for all the employees are carried out and vocational training is imparted to all employees as per the statutory requirements.



Energy consumption

There has been a steady decrease in the electrical energy consumption per MT of concentrate due to the implementation of the various energy conservation measures.

Description	Unit	2002 - 03	2003 - 04	2004 - 05
Concentrate production (zinc + lead concentrate)	Metric tonne (MT)	408169	524403	597051
Total energy consumption	Lakhs kWh	845.46	967.33	1070.44
Specific energy consumption	kWh / MT	207.13	184.46	179.28
Energy cost as % of manufacturing cost	%	17.5	16.3	15.3



Energy Policy

Our mission: -

WE, AT RAMPURA AGUCHA MINES ARE COMMITTED TO CONTINUOUSLY IMPROVE OUR ENERGY PERFORMANCE IN ALL OUR ACTIVITIES AND PRODUCTS SO AS TO MAKE IT ENVIRONMENTALLY SUSTAINABLE FOR FUTURE GENERATIONS.

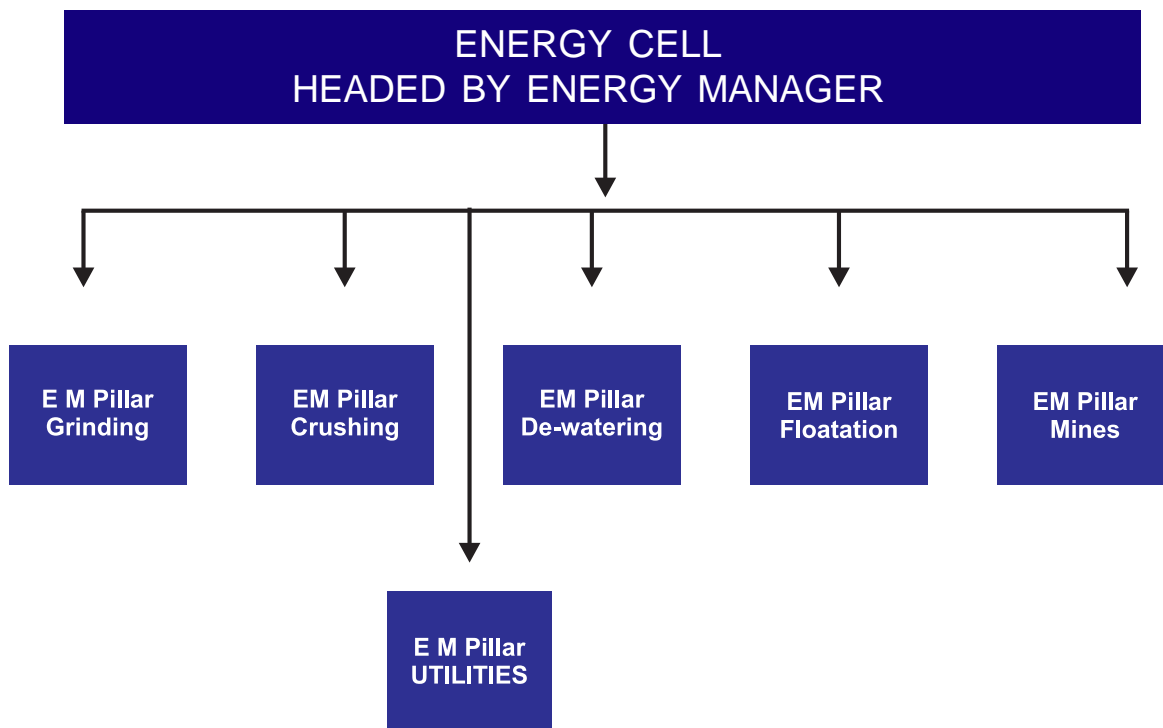
To be the lowest specific energy consumer in the industry segment we operate.

This mission we achieve by implementing these: –

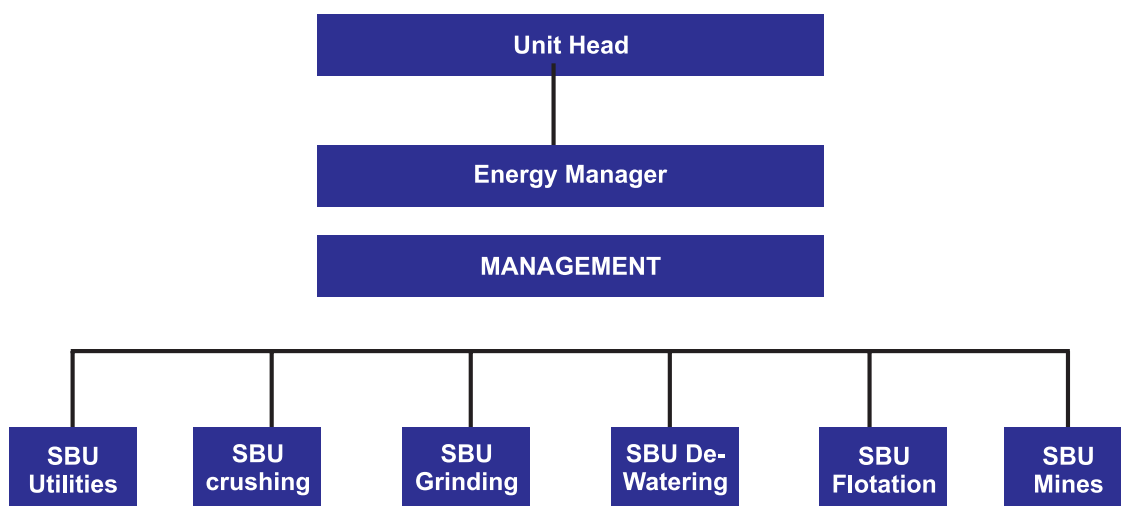
- To train employees to make Rampura Agucha mine the pace starter in the field of energy conservation.
- To carry out regular internal and external audits to identify areas for improvements.
- To benchmark continuously our performance against the best in the world .
- To enrich our experience on energy conservation by exchange of ideas with other organizations.
- To promote awareness among all the members of the company.
- Replacement of energy inefficient equipment with energy efficient equipment.
- To adopt energy efficient technologies/equipment for all new projects.
- To comply with energy legislation and other regulations.
- To communicate energy management policy to all employees and encourage their participation through proper training .
- To recognize effects of our employees in energy conservation.

Unit head
Rampura Agucha Mine
Hindustan Zinc Limited

Energy Management setup



EN. CON. CELL STRUCTURE



ENERGY CONSERVATION PROJECTS UNDERTAKEN DURING 2004-05

(1) Installation of a.c. drives in zinc Regrinding cyclone feed pump.

It was observed that flow and pressure at the cyclone were not constant and it was maintained by throttling the suction. A.C. drives were installed in this location to overcome above problem and for power saving.

Cost involved : Rs. 8.5 lakhs

Annual saving : Rs. 6.00 lakhs

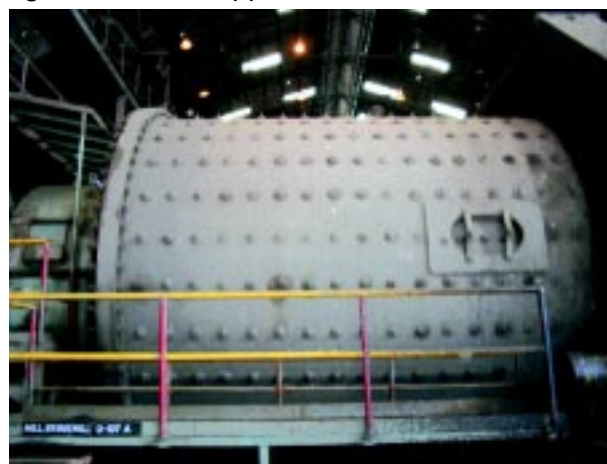


(2) Use of lower size of grinding media.

The avg. diameter of the grinding media inside mill was found 35 mm. Required diameter was theoretically calculated and it was found 30 mm. So grinding media of size 40 mm was used in the mill from April 2004 and avg. diameter was found 30 mm. The lower size of grinding media reduces the void inside mill and hence grinding efficiency increases.

Cost involved : Nil as we started taking 40 mm grinding media from supplier .

Annual saving : Power reduction 0.20 kwh / MT
(Rs. 17.18 lakhs)



(3) Reduction in grinding power by increasing the speed of ball and rod mill

The plant through put was increased by de-bottlenecking two different areas. One of them was to increase the speed of ball and rod mill. The critical speed of the ball and rod mill was 20.49 rpm and 26.44 rpm. Earlier rod and ball mills were running at 65 % and 71 % of the critical speed. After change of pinion the speed of the mill were increased and now they are running at 70 an 80 % of their critical speed. Grinding efficiency has been increased and power saving is 0.1 kw/MT.

Cost involved : Rs. 10 lakhs

Power Saving : 214825.4 units (Rs. 8.59 lakhs)

(4) Installation of seal water pump



Initially two seal water pumps were running continuously with a combined discharge of 13 lps and pressure of 8 kg / sq. cm . these pumps were replaced by a single pump of a capacity 13 lps and pressure of 6.45 kg / sq. cm .

Cost involved : Rs. 1.0 lakh

APPROXIMATE SAVING : RS. 4.5 LAKHS / ANNUM

(5) Increase in through put



The through put of the plant is increased from 290 MT / hour to 295 MT / hour by optimization of existing process and debottlenecking projects that has resulted in reduction of specific power consumption of 0.5 kwh / MT

Cost involved : Rs. 35.0 lakhs
Annual Saving : Rs. 40 lakhs

(6) Improvement in mill water supply system.



In mill water supplied from overhead tank at a height of 42 meter was substituted by supplying partly from over head tank and mostly (60 %) from a low level reservoir of 50000 cubic meter capacity .

Annual saving : Rs. 44 lakhs .

(7) Reduction in LT power in mill (Taken in six sigma project)



LT motors (above 15 kw) installed in the plant were studied and through various improvement measures like energy auditing , analysis of all flotation cells , pumps , contour of pipelines , alteration in sump pump discharge points , bypassing of intermediate pumps , LT power was reduced from 16.04 kwh / MT to 15.69 kwh /MT .

Cost involved : Rs. 12 lakhs (for small modification)
Saving : Rs. 32 lakhs



(8) Conversion of lightly loaded motor into permanent star connection

Efficiency of a motor reduces drastically for loading below 40 %.
In our Plant all the motors which were lightly loaded (less than 40 %) were permanently connected into star resulting in power saving .

Cost involved : nil
Annual saving : Rs. 3.51 lakhs



(9) Replacement of 450W HPMV lamp by 250 W HPSV lamp.

In process Plant 450 W lamps were replaced by 250 W HPSV lamps resulting in power saving .

Cost involved : Rs 1 lakhs
Annual saving : Rs. 3.2 lakhs



(10) Providing translucent sheet in the main process plant to avoid artificial lighting :

In the main process plant more transparent sheets were provided to avoid artificial light.

Cost involved : Rs 1 lakh
Annual saving : Rs 2.75 lakhs



(11) Energy Audit of all SPVC , other pumps , and their optimization .

After brain storming by our team the diameter of 139 SPVC pump was increased from 6 inch to 8 inch and delivery line was rerouted to reduce the length and bend and frictional head. consequently discharge volume increased and power consumption reduced after stopping one pump.

Cost involved : Rs 4.0 lakhs
Annual saving : Rs 6.68 lakhs



Energy Conservation Plans and Targets

1. Replacement of existing heatless desiccant type of compressed air dryers with refrigerated type dryer.
2. Installation of new screw compressor with VFD for instrument air .
3. Reduction of generation pressure of the reciprocating compressor for filter press .
4. Installation of separate pump and cooling tower for compressors and blowers .
5. Use of separate head for different head for different users of lead water circuit pump .
6. Installation of lower size pump for process seal water pump.
7. Optimizing the operation of cooling tower pumps.
8. reducing the head of hot sump pump
9. Installation of VFD for cooling tower fans
10. Installation of VFD for lead and zinc filter feed pump .
11. Reduction of rpm of primary dust extraction fan .
12. Installation of VFD for shower pump .
13. Optimizing the power consumption of secondary dust extraction fan no.1
14. Replacing secondary dust extraction fan no. 2with energy efficient fan.
15. replacement isolation transformer used in lighting circuit with amorphouscore transformer .
16. Replacement of conventional 40 W fluorescent lamps with 28 W T% series lamps .

Estimated investment = 70 lakhs
Annual target savings = 113 lakhs

ENVIRONMENT HEALTH AND SAFETY POLICY

We at Rampura Agucha Mines, producers of lead and zinc concentrates are committed to

- Continual improvement in our environment and safety performance indicators.
- Comply with all applicable Environmental and Occupational Health and Safety legislations.
- Work towards prevention of pollution and minimizing occupational Health and Safety risks.
- Minimize pollution and conserve key input resources.
- Minimize loss time accidents.
- Use environmentally sound technologies and standard safety equipments wherever viable.
- Train all employees, departmental as well as contractors, in sound environment, Health and Safety practices.

PLANTATION AT R.A.MINE



FOLLOWING MEASURES ARE TAKEN TO ATTAIN ZERO ACCIDENTS.

- Shop floor safety talk by the supervisors, engineers on weekly basis.
- Inspection and safety Audit.
- Safety inspection by safety officer to be carried out regularly.
- Safety instruction to work person during inspection.
- Safety Audit of equipment are to be carried out quarterly by respective "ENGINEER"
- Training by vocation wise as per norms.
- Special Training for new method, new equipment.
- Refresher training to seriously injured person before joining to duty.
- Counseling of accident-prone person.
- TPM'S Safety pillar is one of the active pillar which has resulted to bring down the accident rate of the plant.