CHAPTER 8

CASE STUDY - ACC CEMENT

TIKARIA, GAURIGANJ,

UTTAR PRADESH
CASE STUDY

ACC- Tikaria Cement Works

Post: Gauriganj, District: Sultanpur (U.P.)

Unit Profile:

Tikaria Cement Works is a unit of ACC Ltd & is located at Tikaria Industrial Area, P.O.Gauriganj and Distt. Sultanpur (U.P.). It is now operating with an annual capacity of 2.6 million tons and is one of the biggest & eco- friendly, grinding and packing plant in the country, producing 100% environmental friendly cement (conversion of fly ash, a waste generated from thermal power plant into value added product i.e. Portland Pozzolana Cement-fly ash based) by using state of art technology.
The plant was commissioned during 1998 with the aim to serve the market of Uttar Pradesh. The plant started with an annual capacity of 0.6 Million Tons (with one cement mill of 90 TPH). The plant capacity was augmented from 0.6 to 2.0 MTPA during 2002-03 (Two more cement mills of 90TPH each were installed) and further from 2.0 MTPA to 2.6 MTPA during 2009 with installation of two nos. pregrinders. To ensure consistent & quality power, a 15.0 MW Captive power plant was also installed.

<table>
<thead>
<tr>
<th>ACC CMENT TIKARIA HISTORY:</th>
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<tr>
<td>Establishment</td>
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<tr>
<td>Production Start from</td>
</tr>
<tr>
<td>Plant Director at that time</td>
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Environment protection and pollution control measures have always topped in list of priorities. Being a system oriented organization; Tikaria Cement Works is certified with ISO 9001 Quality Management System, ISO 14001 Environment Management System & OHSAS 18001 Occupational Health and Safety Management System.

**Energy Conservation Policy and Set up**

Develop & promote suitable product profile to achieve ever lower energy consumption levels & still meet the requirements of the customer. Ensure continual reduction in energy consumption by continually improving the process of manufacturing /Selection of raw material etc. Conserve high value energy sources by replacing them with low value energy sources. Minimize transmission /transit losses. Create awareness among employees to conserve energy and natural resources. Maintain machine/ equipments so
that they can be operated at their optimum efficiency. Eliminate / Control the idle run of machines / equipments. Minimize the waste generation & re-utilize the same for valve addition. The Energy management set up involves two groups i.e. Top level & Bottom level.

1. Top Group: Includes the involvement & commitment of top Management (this includes: Plant Head & Senior Managers). This group provides encouragement, support, guidance & resources.

2. Bottom Group: Includes “Energy coordinator” and all Departmental Heads

   Working Group: Includes the persons from operation & maintenance and other service support.

**Salient initiatives are listed below:**

1. **Mines & Crusher** – Improving the efficiency of dewatering Pumps at Kymore mines and the installation of tertiary crusher at Kymore, Chanda and Gagal.

2. **VRM Section** – The output of the vertical roller mill (VRM) at Tikaria was increased from design levels of 220 TPH to 360 TPH in a phased manner by---

   ➢ Change in separator from Polysius to LNV separator.

   ➢ Increase in VRM gear Box speed from 24 RPM to 27 RPM.

   ➢ Installation of Hybrid ball mill to grind limestone from separator rejects

   Conversion of screw feeding system to belt feeding system.

3. **Process** - Major process changes were carried out at Chaibasa, Tikaria and Lakheri plants from wet to dry process and at Madukkarai from wet to semi-dry process. This has resulted in substantial reduction in thermal energy consumption with a marginal increase in electrical energy consumption.
4. Cement Mills-

➢ Installation of pre-grinders for cement mills at Gagal, Chanda & Tikaria

➢ Improvement in mill output by modified liners and close circuiting of Mills at Chaibasa, Chanda, Sindri.

➢ Replacement of pneumatic conveying system by mechanical conveyor at Madukkarai, Chanda, Tikaria, Jamul and Gagal.

➢ Grinding media pattern optimization at Tikaria.

➢ Increased fineness of VRM product by reducing Mogen Sensizer finer screen at Tikaria.

➢ Installation of new cement mills of higher capacity at Gagal, Tikaria, Kymore, Lakheri and Chaibasa

5. Kiln Section

➢ Improvement of Kiln Burners at Gagal, Tikaria, Bargarh and Lakheri plants.

➢ Installation of high efficiency seals at discharge end of Kilns at Lakheri, Chanda and Bargarh.

➢ Increased utilization of alternate fuels at Lakheri, Gagal and Madukkarai

➢ Addition of new pre-heater stream at Lakheri and Gagal

➢ Addition of pre-heater stage at Gagal and Jamul


7. Packing Plant - New packers installed at Sindri, Wadi, Tikaria and Gagal.

8. Coal Mill - Replacement of coal mill grit separators with dynamic separators at Chanda, Tikaria and Jamul.
Energy Consumption (TIKARIA)
(From 2007 – 2009)

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>2007-08</th>
<th>2008-09</th>
<th>2009-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Electrical Energy Consumption (p.a.)</td>
<td>Lakh KWH</td>
<td>985.34</td>
<td>1156.61</td>
<td>1638.55</td>
</tr>
<tr>
<td>Specific Electrical Energy Consumption (p.a.)</td>
<td>KWH/ Ton</td>
<td>31.84</td>
<td>32.68</td>
<td>39.64</td>
</tr>
</tbody>
</table>

Production Chart ACC Cement Tikaria
(Lakh Ton)

<table>
<thead>
<tr>
<th>Year</th>
<th>Production</th>
<th>Dispatch</th>
<th>Surplus</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008-09</td>
<td>17</td>
<td>16</td>
<td>1.0</td>
</tr>
<tr>
<td>2009-10</td>
<td>18</td>
<td>17.56</td>
<td>0.44</td>
</tr>
<tr>
<td>2010-11</td>
<td>18.5</td>
<td>18</td>
<td>0.50</td>
</tr>
<tr>
<td>2011-12</td>
<td>20</td>
<td>19.59</td>
<td>0.41</td>
</tr>
</tbody>
</table>
Dust Control

‘ACC Tikaria’ has a mix of cement plants that has modern plants as well as those using older technology namely wet, semi dry, long dry kilns and four stage suspension preheater kilns. Over time, when changes took place in cement manufacturing technology, plant and equipment capacities were progressively upgraded.

![Dust Control Machines in Tikaria](image)

AFR (Alternate Fuel & Raw Material) Policy

‘ACC Tikaria’ Vision for AFR Business is to be the most respectable service provider to the waste generators in India. The company has an AFR Policy that governs its behaviour and operations in co processing various kinds of wastes in cement kilns. In order to comply with the principles listed in the policy as also to provide better services to our customers, AFR testing laboratories for speedy and accurate evaluation of wastes,
continuous emission monitoring systems on kiln stacks, waste specific feeding arrangements and pre-processing platforms at different locations.

_The following are some highlights of the initiatives taken by the AFR team in 2009:_

- A national level agreement with a leading company in fast moving consumer goods business to dispose of their expired products at ACC's Tikaria plant in Uttar Pradesh.

- Uttar Pradesh Pollution Control Board was the first to grant permission to ACC Tikaria works for the trial burn of ETP sludge and poly residue waste at Tikaria Works. In order to demonstrate the safe and environment friendly disposal of these waste materials to various stakeholders ACC undertook a successful co-processing trial with these materials.

- Memorandum of Understanding (MoU) with Indian Centre for Plastics in the Environment (ICPE) for Joint Industrial Research Project on Co processing of Plastics Waste as Alternate Fuel in Cement Kilns.

- The Tikaria plant in U.P. successfully disposed of an entire generation of spent activated carbon from a reputed refinery.

- The Tikaria plant in Uttar Pradesh safely disposed an entire generation of calcium fluoride sludge, a hazardous waste from fertilizer industry.
Greening

ACC Tikaria has won several prizes and certificates of merit for its programmes involving 'greening,' forestation, reclamation and rehabilitation, top soil management, noise abatement and other visible measures such as tree plantation and water management. ACC has proudly showcased its successes with reclamation of lands abandoned as mines and quarries. Some of these desolate tracts have been transformed into green parks, orchards, forests and even a bird sanctuary with a picturesque lake.

Tree plantation is a regular and committed activity. Vacant land available in the plant and colony at each of this factory is used to develop greenery of various species. Some of its plants have developed as much as 40 per cent area for green belts as compared to the statutory requirement of 30 per cent. The cement plant has its own success story of tree plantation, greening activities, horticulture, flower and fruit cultivation and water conservation.
Bio Diversity:

Among the most satisfying results of the company’s horticulture, rehabilitation, greening and afforestation activities is the opportunity, it provides to enable natural life to flourish. This is most evident in the many water bodies created in abandoned mines or the dense forests and orchards grown on arid and barren lands where migratory birds, insects and plants thrive.

There are no known instances of any endangered wild life or plant species around our locations. No formal study has as yet been undertaken to assess the impact of our operations on the flora and fauna around plant and mines. However the ACC Tikaria Plant aims to take up this task within the next two years.

Water Management:

ACC Tikaria Plant’s water conservation efforts have been noteworthy, with important contributions from nearly all our plants. The company maintains a norm of Zero Water Discharge at all cement units. Water is used in the plants as industrial cooling and the entire water is recycled through cooling towers, water ponds and tanks. Ground water
encountered during mining operations at our mines together with any other rain or surface water, is pumped out of the mines to keep it dry for operation.

Towards Greener Technologies

ACC Tikaria has initiated several steps to reduce CO2 emissions through various means such as upgradation of technology, usage of alternative fuels and raw materials, reducing clinker factor by using materials like fly ash, slag and various energy conservations means. The company has registered two of these projects under Clean Development Mechanism (CDM).

Blended Cement Project: This project seeks to conserve limestone through an increase in the proportion of fly ash blend in cement. Generally in India, 18-20% is the fly ash proportion, whereas ACC has increased this proportion to 30%. ACC has put in considerable investments in implementing this project activity at site. The major investment is in increased capacities of fly ash feeding silos, conveyor systems, feeding systems, and synchronization of project activity with Centralized monitoring and management system.

Industrial farming Of CO2: ACC Tikaria has initiated a project to sequester CO2 generated by cement kilns to produce high energy oil bearing algal biomass, which can then be reused as fuel in cement kilns. Conservation of fossil fuel and CO2 mitigation are the two main driving goals of the project. The plan is that the algal biomass produced by the bioreactor, through recycling of the CO2 from the cement kiln stacks, will be directly fired in the captive power plants and the cement kilns. The targeted goal of this project is to harmonize the algal production rate with the CO2 emission rates, and ensure continuous recycling of CO2, thus providing continuous algal biomass fuel for the kiln
and power plants. It involves the screening of appropriate high and fast yielding algae cultures, the development of a bioreactor on a lab bench scale, scaling up the technology to a pilot plant and then demonstrating the same commercially. The project calls for a multi disciplinary approach and involves microbiologists, algae experts, bio technologists, engineers and other professionals.

**Waste Heat recovery:** In dry process cement plants nearly 40 percent of total heat input is rejected as waste heat from exit gases of pre-heaters and grate coolers. In this Tikaria plant the waste heat is utilized for drying raw material or pre-heating air required for coal combustion. But even after covering these applications, there is still some heat available which can be utilized for electrical power generation. Tapping this energy offers much potential. Waste Heat Recovery Systems are known to be working successfully in cement plants in some countries. The power generated in this way can be enough to operate the kiln section on a sustained basis.

**Social Performance**

ACC demonstrates the practices of being a good corporate citizen and has a clearly stated policy in respect of its corporate social responsibility.

**Human Resources and Employment Practices**

ACC Tikaria has a fair and transparent recruitment process with adequate opportunities to look for suitable candidates internally as well as from outside.

**Performance Management:** The Company’s performance management system is in itself a benchmark that provides ample opportunities and motivational incentives to employees to reward and retain good talent. There are Performance Linked Incentives, Good Work Awards, Letters of Appreciation, Special Increments, Promotions,
Nomination to external training programmes in India and abroad, public felicitation and appreciation Awards. Some plants felicitate and reward Best Employee and Employee of the Month. Employees who display aptitude are invited to become Trainers themselves and receive Train the Trainer facilitation.

**Welfare & Amenities:** Employee welfare receives prime attention at ACC Tikaria. We have several schemes for general welfare of employees and their families. These cover education, healthcare, retirement benefits, loans and financial assistance and recreation facilities. Liberal medical benefits are made available to employees and their family members by way of reimbursements towards normal medical treatment, domiciliary treatments and special sanctions for serious illness. Each of our townships has well-equipped health care centres with qualified medical staff and facilities, ambulance, referrals and tie-ups with reputed hospitals for specialized treatment. In addition, there are regular health check-ups, camps and programmes. Employees are eligible to apply for loans and financial assistance for various purposes such as purchase of assets, residential premises as well as a scheme that provides for supply of cement at subsidized rates to those building their own houses.

**Employee satisfaction:** In addition to periodic internal Employee Satisfaction Surveys, ACC Tikaria participates in Employee Satisfaction and Work Place Surveys conducted by reputed external agencies like Hewitt Associates and Grow Talent. It has also retained reputed firms like Mercer and Boston Consulting Group to study the internal work environment and employee policies to suggest areas of improvement. We share below salient points of the latest survey of employees:

- People are treated fairly regardless of religion and gender
- ACC is a safe place to work
- Management is competent in running business
- Employees feel good about what we do for society
- Proud to tell others I work here
- Management thinks positively

The overall findings show significant job satisfaction at all levels as also deep respect for the Company, its performance management system and its overall business performance.

**Employee practices:** ACC Tikaria has a good record in respect of the treatment of its Human Resources. HR policies and procedures have been designed to give prime importance to employee welfare and to enable a work environment that combines mutual trust and productivity. The Company is committed to enforce all relevant provisions and rules of various statutes/authorities as regards labour policies and practices. Regular internal audits are carried out by Corporate Human Resources and Management Audit. The Company participates in various external surveys to benchmark its existing policies and practices to constantly improve upon the same and align itself with the changing employer-employee paradigm and expectations.

**Occupational Health & Safety**

**Safety Awareness Campaign:** Safety awareness campaign was carried out for the employees working in Tikaria office of ACC. The purpose of the campaign was to create awareness amongst the employees regarding OH&S policy, principles and management system. The campaign also covered awareness sessions on safety on road, rail safety and safety at home. The participants were made aware of important safety aspects; one should keep in mind while traveling by rail or road. They were also given tips to improve safety
at their home. During the campaign all the participants were given a pocket guidebook covering basic aspects of safety at workplace which they can refer to all the time.

**OH&S Organization Structure:**

ACC Tikaria’s OH&S Organization is headed by the Managing Director and extends into three groups i.e. Corporate, Region, and Plant. An OH&S coordinator at corporate office drives the OH&S policy and principles in this plant of ACC and provides expert advice to the management regarding OH&S matters. He is supported by professionals overseeing four important areas - OH&S Training, OH&S Programmes, OH&S Reporting & Administration and Construction Safety

**Health Care**

Each of our townships has well-equipped health care centres that are mini-hospitals with qualified medical staff, the latest in basic diagnostic equipment and facilities including ambulance and referrals with reputed hospitals for specialized treatment. In several locations, we share these facilities with members of the local community. At other places, the company provides mobile health services to adjoining villages and conducts regular diagnostic health camps focused on general medicine as well as special ailments and diseases such as Mother child health care, Cancer detection, Hepatitis, Tuberculosis, Eye check-up, and Diabetes

*Regular Medical Checkup Tikaria*
ACC Works Limited

ACC Limited is India's foremost manufacturer of cement and ready mix concrete with a countrywide network of factories and marketing offices. ACC's brand name is synonymous with cement and enjoys a high level of equity in the Indian market.

TIKARIA (2012): AT A GLANCE

General Manager
Mr. A.K. Saxena
Production Manager
Mr. S.S. Chauhan
Accountant Officers
G.N. Pandey
Purchasing Officers
Tej Bhan Singh
H R
Sashi Kant
Total No. of Employee in Tikaria Plant
108 (approx)
Future Target for Dispatch (2012-2013)
20 lakh ton (approx)
**Procurement Organization:**

The materials management and purchase processes were reorganized in 2006 as the company's new Procurement function. The function underwent further change after implementation of an SAP based Enterprise Resource Planning (ERP) system. The Procurement function now comprises a Central Procurement team at the corporate office for the requirements of major inputs for the operation of cement plants. Central procurement is divided into the following major groups:

- Raw materials
- Energy, Fuels and Gases
- Maintenance spares
- Wearing parts, Consumable materials
- Administrative & office supplies
- Services
- Packing

The structure provides for procurement managers at regional level and plants. There is a separate projects head for procurement of capital equipment and purchases.

**Supplier Relations**

**Code of Conduct:** Adequate care is taken to ensure transparency in procurement processes. A new policy was adopted in 2009 which has a clearly defined code of practice for procurement conduct aimed at setting the norms of behaviour governing employees involved in various activities of procurement. The policy enshrines the practice of fair competition and forbids interference with open competition in markets.
Vendors are assured equal access to non-confidential information. The policy calls for clear criteria to be communicated to vendors such that the process generates equal expectations from comparable vendors towards providing the best acceptable solution for both parties. There are provisions for avoiding conflicts of interest and misconduct such as bribery and corruption.

**Procurement Manual:** The procurement manual describes the processes and sequential and procedures to be followed in procurement including vendor registration and appraisal, indenting and tendering. There are detailed guidelines for negotiation, order acceptance, order processing and execution and payment.
ACC TIKARIA PLANT: ORIGINAL PHOTO

GALLERY
Tikaria Cement Works: Main Gate Photo

Loading of Trucks in Production House in Tikaria Plant
Packing Plant Tikaria

Loading and Measurement of Products
Receipt Counter of Production Department in Tikaria

Office Photo of Production House in Tikaria
QUESTIONNAIRE

Management of Production in Cement Industry in U.P.(A Case Study of ACC Ltd.)

Respected Sir,

Myself, JEETENDRA PRATAP SINGH, Research Scholar at Dr. Ram Manohar Lohia Avadh University, Faizabad (Uttar Pradesh) working Research on ‘Management of production system in ACC Ltd’. I am requesting you to please fill up this questionnaire form which will be confidential and only be used for this research work.

Part-A

Personal Details:

1. Name

2. Age

3. Designation

4. Department

5. Year of Experience

6. Telephone/Mobile No.

7. E-Mail

8. Fax No.

Date

Signature
1. Are you happy with your job in ACC?
   a) Very happy    b) Happy    c) Not happy

2. How is working environment in ACC?
   a) Good    b) Satisfactory    c) Not Satisfactory

3. How do you find the working condition in your work place?
   a) Good    b) Satisfactory    c) Not Satisfactory

4. What do you think about the production development rate in this company?
   a) Good    b) Satisfactory    c) Not Satisfactory

5. How is your relation with other production unit staff of this department?
   a) Good    b) Satisfactory    c) Not Satisfactory

6. ACC Safety practices for the Production of its workers are satisfactory?
   a) Agree    b) Strongly Agree    c) Disagree

7. ACC First- Aid (medical) facilities?
   a) Available    b) Not Available
1. Can you suggest the other production measures that you want in your organization to offer?

2. Are you satisfy with total annual capacity of the cement production? How is production expected to change between now and 2015?

3. There is only one production plant in Tikaria. Are you satisfied with your services provided all over in U.P.?

4. If you want to improve the overall aspects in production management system in ACC. Please give healthy suggestions and recommendations?

Date

Signature