

UltraTech Cement Limited - A P Cement Works



(i) Unit Profile:

UltraTech Cement Division (part of Aditya Birla Group) consists of five integrated Cement manufacturing Plants and five grinding Units with a total installed capacity of 17 Million Tons per annum (MTPA) located in different parts of the country. AP Cement Works (APCW), located at Tadipatri, Anantapur Dist, A.P. with an Installed Capacity of 2.00 MTPA was commissioned in April 1998 with the latest Cement manufacturing technology from F.L.Smith & Co, Denmark. The plant has been upgraded to 2.70 MTPA through major debottlenecking exercise in 1999 and 2002 by adopting latest technologies. It is always in the forefront in adopting latest technologies or innovations.

APCW manufactures three types of Cement, Ordinary Portland Cement (OPC), Portland Pozzolona Cement (PPC) and Portland Slag Cement (PSC) for its major customer groups like Dealers, Stockists Builders / Contractors, Cement Based Industries. Its ideal location, as far as market is concerned is its advantage. It is, equidistant from all the three major cities in the south Hyderabad, Bangalore and Chennai and caters to Karnataka, Tamilnadu, Kerala and Goa markets, in addition to Andhra Pradesh. The finished product is sold through the Marketing Department, which has a wide dealer network.

It stands first in consistency of product quality and brand popularity and hence enjoys premium rate for its products compared to that of competitors. The premium quality & cost advantage of products, the in time delivery to customers in right quantity & quality, customer confidence, the strategic location of the plant are the principal factors that contribute to its successful leadership in the southern market.

About the Plant: The Cement plant has been engineered with world leaders in cement Technology from FLSmith, Denmark. Critical Machinery was imported. Plant is fully automated and is centrally controlled by process Computers linked to the plant machinery.

The state-of-the-art plant and machinery and their salient features are:

- It has two raw mills having a roller diameter of 3 m and table dia of 5 m. called Atox 50 mills, these are the two biggest mills in the country and first of its kind.
- APCW has a covered circular limestone store of 95-m dia with a stacker-reclaimer. This system with a storage capacity of about 45,000 m³ is the largest in the country, and perhaps one of the few limestone stacker-reclaimers of such huge storage capacity in the world.
- The RCC chimney at the plant is the tallest in the Indian cement industry of 142 Mtr. height.
- A large size single-stage limestone crusher with a maximum capacity of 1,300 tph
- Continuous storage-cum-blending controlled-flow raw meal silo of 22.4 m dia and 60 m height of capacity 30,000 tonnes for feeding to the kiln with uniform and homogenized kiln feed.
- 7500 tonnes per day kiln equipped with six-stage double-stream pre-heater cyclone system.
- The plant is also equipped with vertical coal mill of capacity 71 tph combining drying, grinding and classifying operations in one unit
- Two clinker storage silos – one of 65 m dia with a capacity of 150,000 tonnes and the other of 40 m dia having 57,000 tonnes capacity.
- The packing plant has six electronic packers each of 90 tonnes per hour capacity which give accurate

and consistent weights up to 50 g; the advantage compared to mechanical packing plants is, electronic packers can control the weight of cement packed in bags more precisely.

- The packing plant can load a full rake in one go as the wagon loading platform has a length of 650 m and is equipped with eight wagon loading machines each having three modules. Two rakes can be placed simultaneously one on either side of the platform. Also, facilities for simultaneous loading of cement bags into four trucks including trailers are available. The packing plant siding has nine railway lines for wagon shunting/parking for receiving coal and dispatching cement.
- The production unit and the packing plant have been located at different elevations. Plant is located at the hilltop (351.5 m. Msl) and Packing plant & wagon tippler are Located down the hill (266.0 m. Msl). Usually in cement plants, 60% of cement produced is transported by rail and due to elevation difference in APCW's case; the packing plant has been located at a lower level accessible to railhead.
- The two roller press cement mills for grinding clinker provide an advantage with respect to specific power consumption and the six cement storage silos each with a storage capacity of 5,000 tonnes help in dispatching different varieties of cement as per the market requirement.
- Asia's biggest of its kind 4MW cooler waste heat recovery power plant with technology from ORMAT, Israel (1st of its kind and its size in the world) for recovering cooler waste heat and in the process availing CDM benefits and reducing GHG emissions.
- This plant has installed 2x12.27 MW MAN B&W, Germany power generating sets to meet the plant power requirement, as a captive unit. The other source of power for this plant: is A.P. State Electricity Board, which supplies power at 220 KV to our MRSS from Gooty Bay via a 43 KM HT line.
- Clinker loading system is installed at APCW to supply clinker to ARCW grinding unit. 2 nos. separate silos are constructed for clinker storage and clinker is loaded to open rakes through on line electronic weighing system. The clinker will be fed into the silos through a pipe conveyor from plant clinker storage silos.

The existing facility is being upgraded by 3.4 MTPA along with a Grinding Unit in Karnataka to expand its market base and market share. APCW has also one Grinding Unit at Arakkonam, Tamilnadu attached to it. With this expansion, APCW – Tadipatri will be the single location highest clinker producing plant in the country with installed capacity of over 6.1 MTPA of clinker. To meet its increasing power requirements, the unit is also setting up 2 x 25 MW Thermal Power Plant at its premises that is due for commissioning by Oct'08, which reduces its dependency on grid power. This TPP is adopting technologically advanced boilers of CFBC type with zero water consumption and low stack emissions of 30 mg/Nm³.

APCW recognizes suppliers as important business associates for achieving success in operations. A standard vendor evaluation procedure is adopted and reviewed once in six months for its suitability and current relevance to improve the overall supply chain with respect to quality, cost and delivery performance.

APCW has developed long term partnership with suppliers for Raw materials, fuels, machinery spares and important consumables. Accordingly rate contract agreements are entered into with suppliers for periods up to 3 years. APCW sources all Raw materials, stores & spares and Consumables from Various suppliers in India & abroad. Majority of the Factory Operating Supplies (FOS) are procured from local suppliers only.

Quality Control: This plant is having the latest state-of-the art equipment, instruments for the quality control of raw materials; semi finished and finished products at each stage of production process. The laboratory is having a QCX-XRF system supplied by M/s.ARL, Switzerland, model 8660-Total Cement analyzer and other equipment such as, high temperature furnace (1600 deg.C) from. M/s. Carbolite, UK, Autoclave machine for determining the CV of Coal and other associated equipment/instruments both for physical and chemical testing of the cement and related materials as per the statutory requirements from BIS.

Systems and CMI: The Unit Management fosters a culture of total integrity, credibility, trust, continuous learning, respect for individuals and all partners. It has formulated its own Vision and Mission in line with its Group objectives to drive growth and improvement. Management believes in doing its activities in a systematic manner.

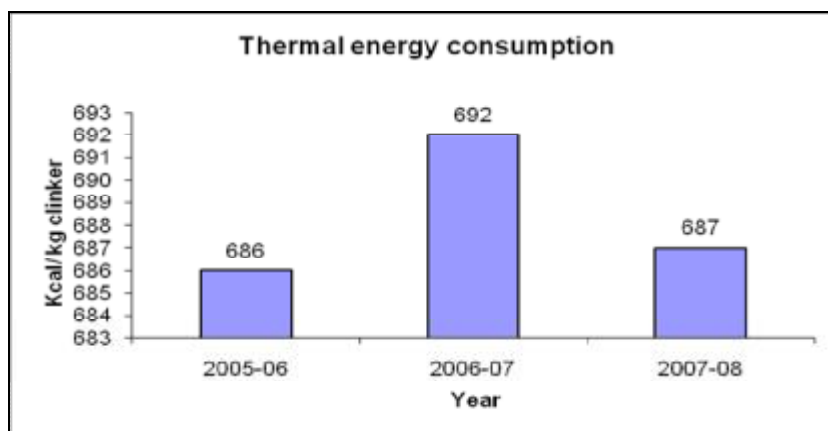
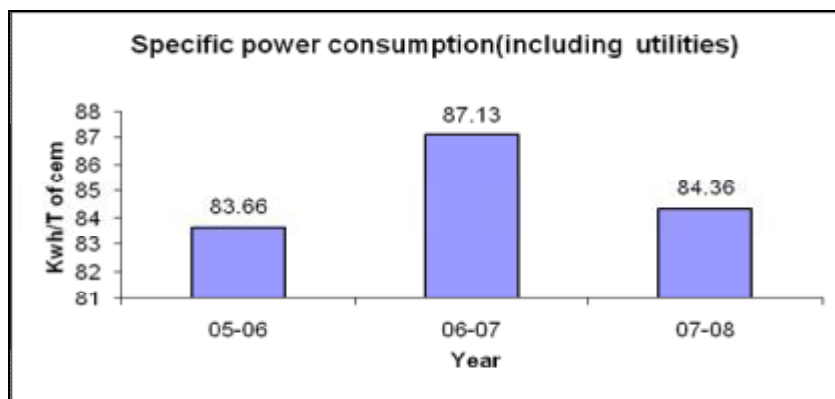
The management had taken initiative of implementing systems in the unit and got certified for ISO:9002(1994) in Oct'99 and ISO 14001(2004) & OHSAS 18001 (1999) together in Jul'00. APCW is the first Cement Plant in the country, which has got certified for all three systems on a unified documented system in the year 2000. In addition to this, its Quality control laboratory has been certified under ISO/IEC: 17025 in the year 2005 and accredited to NABL. The unit has started implementing change management initiatives like Six sigma, TPM, WCM, Bench marking successfully in enhancing its operational growth and achieved substantial benefits at

various stages. The unit received many recognitions and awards in the last 9 years from various independent institutions like CII, APPC, NSC, AP State Government, FAPCCI, NIQR, FIMI, APPCB, PCRA, NCCBM, DGMS (IBM), CSE, GCA for achieving excellence in its operations, productivity, energy reduction, environment, safety, management, etc.

Corporate Social Responsibility: As part of Corporate Social Responsibility, APCW is undertaking various initiatives in the field of Education, Infrastructure Building, Sustainable Livelihood, Health & Social Well-being in line with its Social vision and objectives in the surrounding community and villages. To give it an impetus and channelize all efforts in the right direction, all the rural development activities are being carried out through 'The Aditya Birla Grameena Vikas Trust'.

(ii) Energy Consumption:

S.No.	Particulars	Unit	2005-06	2006-07	2007-08
1	Electrical Energy*	Kwh / Ton of Cement	83.67	87.12	84.36
2	Thermal Energy	K Cal / Kg of Clinker	686.1	691.0	686.7
3	Total Manufacturing Cost	Rs. Lakhs	24766.05	28868.85	30959.86
4	Total Energy Bill	Rs. Lakhs	7653.47	5715.97	6567.89
5	Energy as % of Total Cost of Production	%	31	20	21



- (iii) Energy Conservation Commitment, Policy and Organizational Set up
(Please include a photo copy of unit's Energy Conservation Policy, if decided)

The Energy Conservation Cell is in existence since plant commissioning. The Energy Conservation Cell comprises of highly competent cross-functional positions of various departments. There is a top management commitment for the continuous reduction in the energy consumption. The energy conservation projects are always given top priority. The financial return is not the only criteria for selecting the energy conservation projects. Involvement of all the people is the driving force behind the success of energy conservation initiatives in the plant. An investment of Rs. 3465.20 lakhs was done in last three financial Years.

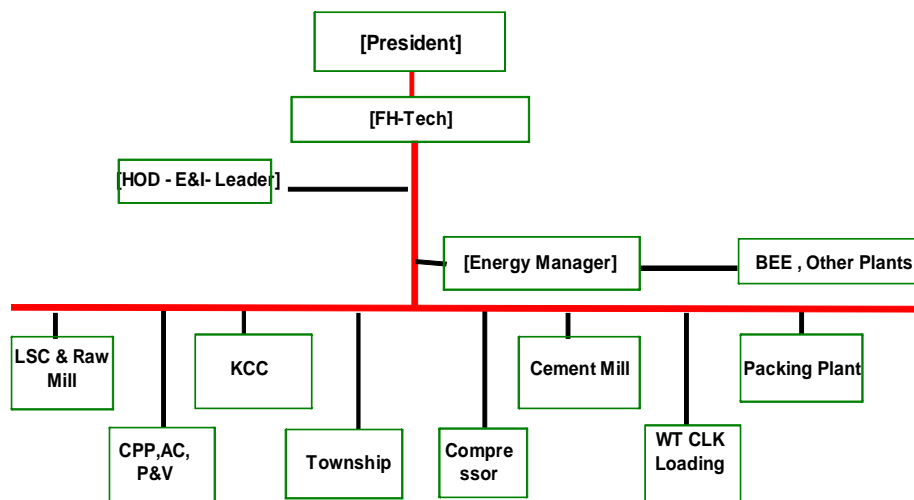
ENERGY POLICY

We shall be committed to

- ❖ Explore & maximize the use of latest & efficient technology to reduce energy consumption.
- ❖ Reduce the consumption of coal, electricity & fuel oil through process optimization in order to reduce the Green House Gas emissions.
- ❖ Utilize wastes such as fly ash & slag to conserve raw materials & use of alternate fuels to conserve fossil fuels.
- ❖ Involve all the employees by motivating and training them on energy efficient practices throughout the plant and to improve productivity, cost effectiveness and work environment.
- ❖ Spread awareness among all employees and their families for conserving energy.

PS Mazumdar
Unit Head

ENERGY ACCOUNTABILITY CENTER AT APCW - TADPATRI



(iv) Energy Conservation Achievements

Production Enhancement

Background of the Project

Enhancement of Raw Mills output from 342 Tph to 410 Tph by suitable modifications in the operations, optimizing the circuit and incorporating changes in the product design.

Photo



Impact of Implementation

By implementing this we can Conserve the conventional Energy Sources, utilizing the existing equipment more effectively and optimizing the resources with less energy consumption

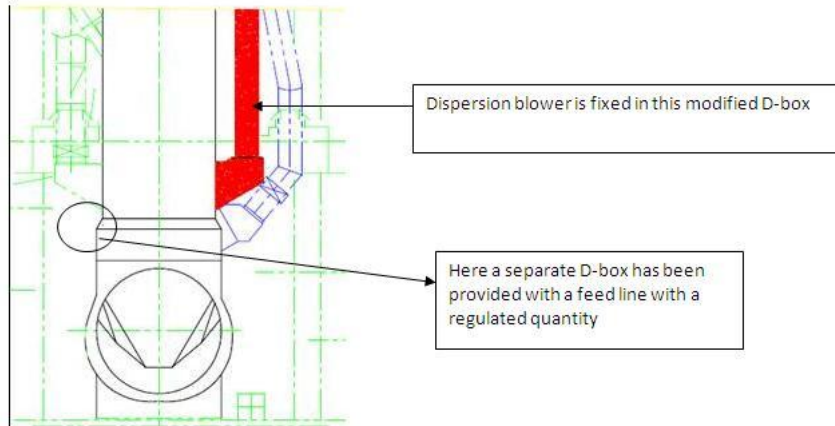
Technical & Financial Analysis

Annual Savings observed	304.00 lakhs
Investment	0.00 lakhs

D-box modification in pre-heater

Background of the Project

Optimizing Kiln operation efficiency, bringing stability in productivity levels and reducing electrical and thermal energy losses



Impact of Implementation

Kiln operational stability, Kiln output enhancement, Enhancement in brick lining life

Technical & Financial Analysis

Annual Savings observed	97.89 lakhs
Investment	15.00 lakhs

Installation of solar water heating systems

Background of the Project

Guest house was using electrical power to water heating in the rooms for hot water supply. Hence introduced Solar heating system for water heating. Totally 14nos units are installed.



Impact of Implementation

Conservation of non-renewable energy resources.

Technical & Financial Analysis

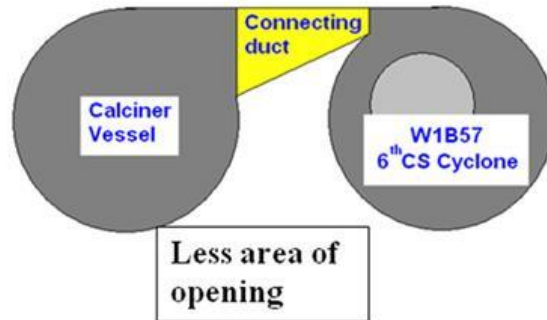
Annual Savings observed	4.00 lakhs
Investment	1.02 lakhs

Preheater cyclone entry duct widening for optimization

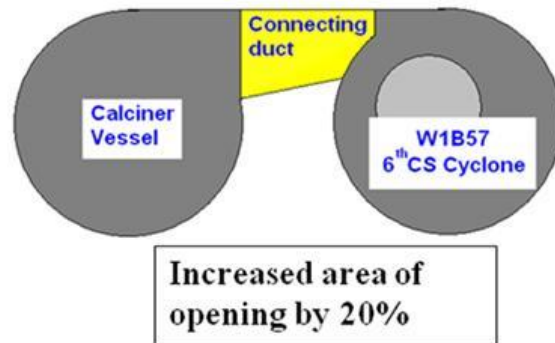
Background of the Project

6th cyclone entry is widened in calciner string of pre heater. Due to this modification load on CS fan reduced from 2100 to 1800kw per hour as the pressure drop has reduced.

Before:



After:



Impact of Implementation

100mm pressure drop has reduced and system optimized

Technical & Financial Analysis

Annual Savings observed (5 kW x 20nos x 24 hrs/day x 120 days x Rs 3.91/unit)	58.69 lakhs
Investment	30.00 lakhs

Modification of equipment to use compressed air at plant operating pressure

Background of the Project

We are using high pressure air for our Waste heat recovery power plant. This air was to be tapped from existing plant air line which normally is operated at low pressure. To meet requirement of WHRPP, generation of high pressure air is required and which ultimately accounts for the entire plant. To avoid this high pressure air generation, Waste heat recovery power plant compressor air line was modified to operate WHRS at plant operating pressure.



Impact of Implementation

Compressed air pressure could be maintained at low operating pressure and savings in energy

Technical & Financial Analysis

Annual Savings observed (1 kW x 100nos x 20 hrs/day x 330 days x Rs 3.91/unit)	16.30 lakhs
Investment	5.00 lakhs

(v) Energy Conservation plans and Targets

Energy Conservation Measures (Planned)	Anticipated savings		Approx. investment (Rs.lakhs)	Project Commencement & Completion year
	in			
	-			
	Energy Value (specify units) in Lakhs	Rs. Lakhs		
Slide gates in place of Louver damper for KS fan, CS fan, Cooler ESP Fan, KM fan	2.97	7.34	15.00	2008-09
Installation of 2 x 25 MW Thermal Power Plant	3468.00	5895.60	26000.00	2008-09
Kiln down comer modifications to reduce power consumption	4.14	10.23	12.00	2008-09
Replacing of cooler fans dampers with slide gates.	1.24	3.07	8.00	2008-09

Specific Energy Consumption Planned Target for the year 2008-09 & 2009-10

Please list specific energy consumption (energy consumption per unit of production) targets for the next 3 years

Year	Electrical*	Thermal*	Reduction over the year 2007-08	
			Electrical%	Thermal%
2007-08 (Base year)	84.36	686.69	-	-
2008 - 09	84.00	685.00	0.43	0.25
2009 -10	82.00	684.5	2.80	0.32

Anticipated money savings at the end of 2009-10 = Rs. 212.88 lakhs/ year

(vi) Environment and Safety

Measuring and managing any adverse effects of the organization's asset on the community and employees (including ergonomics, health and safety) is the prime objective.

Pollution control equipment worth Rs.25 Crores was spent in the initial stage itself to minimize any adverse effects on community including employees.

Regulatory Environment: UltraTech strictly abides by all the rules and regulations of the Government and believes in paying all its dues promptly (sales tax, income tax, excise/custom duties, etc.) to the authorities concerned.

All the products are designed and manufactured in line with the respective IS codes. The factory is regulated by the Factories Act of A.P, Mines Act for Mines and the entire standard acts, rules and laws applicable in India/Andhra Pradesh State for any manufacturing unit.

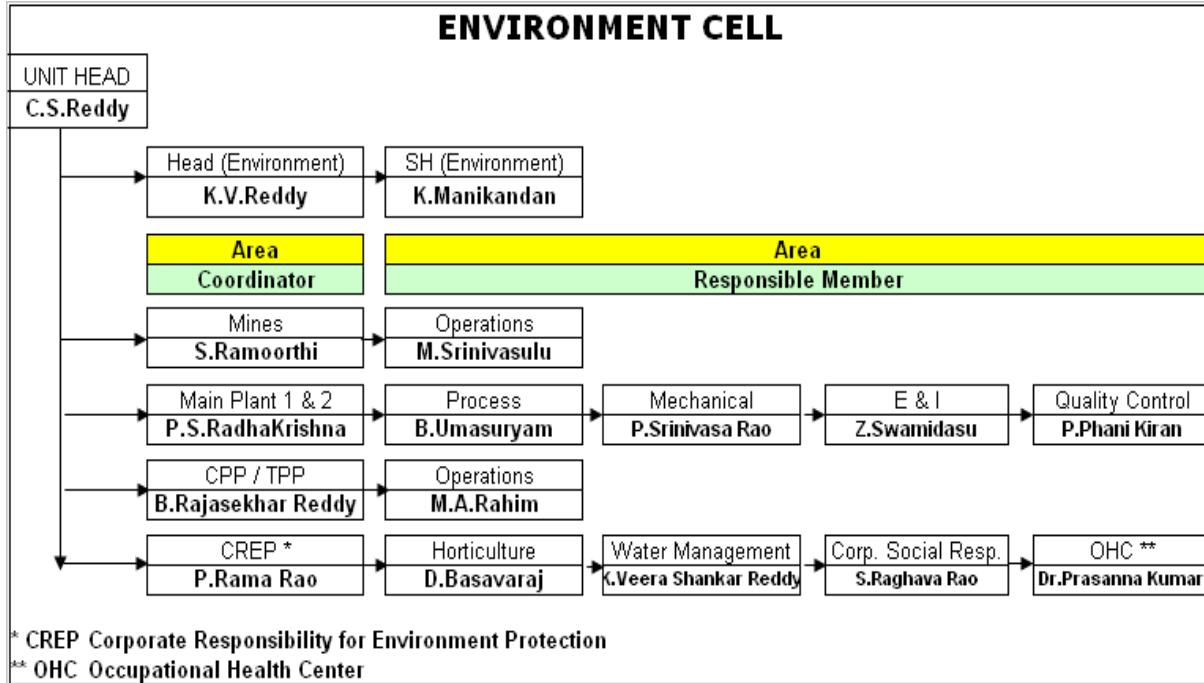
Though the state govt. limit for stack is 115 mg/ Nm³, APCW has gone for Bag house technology with special design of imported bags for main stack as well as coal chimneys, to restrict the emissions to below 50 mg/nm³. The other stacks are fitted with pollution control equipment; the stacks like ESPs, bag filters and the emissions are always maintained well below 60 mg/Nm³.

The salient features of APCW regarding pollution control are mentioned below.

- 20 Chamber reverse air bag house for raw mill and kiln dust to ensure the dust emission through stack, less than 50 mg/nm³
- 16 chamber bag house for coal circuit to ensure dust emission less than 50 mg/nm³.
- 99% efficient ESP's for cooler and cement mills
- 58 Jet Pulse Filters and 57 Insertible dust collectors at various locations of the plant
- Main Stack of 142 Mts. Height to reduce the impact of emission on surrounding villages
- Water sprinklers & spray systems at material storage & feeding points.
- Sewage treatment plant (STP)

At APCW Environment, Safety, Health and other related risks are identified and their impact assessed. The action plans related to EHS mainly focus on identifying the areas for improvements on EHS with respect to the latest amendments in statutory laws, need based on the current situation, training employees, creating awareness and learning from other companies. All operation risks are addressed as part of OHSAS and EMS management.

Corrective & preventive measures are identified and implemented as per need based. APCW has established an exclusive cell for improvement of EHS aspects in a focused way and the structure is as shown here.



Environmental protection

Environmental protection is taken care through afforestation and water conservation programmes. One full time qualified horticulturist is assigned to monitor these activities.

APCW has engaged M/S Vimta labs, a NABL accredited agency to continuously measure and monitor various environmental aspects both inside the plant in and around surrounding areas throughout the year under the guidance of plant personnel. Based on the findings, appropriate corrective and preventive measures are taken up.

Occupational, Health and Safety (OHS)

As part of implementation of Occupational Health and Safety systems, all the operations of APCW are listed, evaluated for the occupational health and safety risks. Critical risks are identified depending on the rating. They are either terminated with suitable Occupational health and safety management programmes (OHMPs) or tolerated at the same risk level with suitable work instructions to the people who are involved in that particular operations.

Besides technological initiatives, there is a system of conducting the complete health check-up for all the employees including Spirometry (Lung test) with sophisticated equipment. The results of the tests show that there is no significant impact on their health, but monitoring is a routine exercise and strives to improve awareness of employees through training.

Only in few locations like crusher, fans, Captive power plant etc. the noise levels are little high which are operated from control room. Whenever human intervention is needed, all necessary PPE is provided to employee. As specified under OHSAS 18001, these employees undergo regular audiometric test. Suitable occupational health management programmes are taken up to reduce the noise levels over a period of time with considerable investment.

Fire Extinguishers, Fire hydrant and fire Protection systems

The security department ensures the availability of fire extinguishers at various locations in and around the plant to tackle emergency situation, this also tested once in every six months and maintained as per the planned schedule.

The fire hydrant system network is provided for entire plant to take care of any fire hazards with an Emergency preparedness plan in place. The fire alarm systems are installed in sensitive areas like MRSS, CCR, MCC, Accounts

Record room, PLC rooms, which monitor and generate alarms at CCR and hooter at respective areas in case of any fire accidents.

Sewage treatment plant & Hazardous waste management

A full-fledged sewage treatment plant (STP) is established to treat the wastewater generated in colony & after treatment the same is used for horticulture.

The plant operations generate the following hazardous wastes

- a. Waste oil sludge from DG operations.
- b. Waste mineral oil from plant equipment, used for lubrication.
- c. Waste grease from plant equipment, used for lubrication.
- d. Lead acid batteries from Mines heavy earth-moving machinery (HEMM).

Consent is obtained from APCCB for disposal of hazardous waste like waste mineral oil, waste grease, waste sludge oil and used lead acid batteries and implemented. Some of non-hazardous waste like steel scrap, cotton waste, used belting and other used spares are collected, segregated systematically by materials department and disposed off periodically.

The other best management practices and initiatives in place are:

- 8 Using additives in Captive Power Plant to minimize the sludge generation in fuel oil
- 8 Centrifuging the lubricant oils of plant equipment to increase the life of lubricant and there by reduction in consumption of lubricants
- 8 Carrying out the oil analysis to increase the life of lubricant and there by reduction in consumption of lubricants
- 8 Usage of on line centrifuges for mine dumpers to reduce the lubricant consumption

Environment, Health and Safety - Awareness promotion

The risks that are already identified and their impact shall be evaluated through periodic internal audits/ external audits by agencies like LPA, NSC etc. The risks are reviewed every six months by the departments under the guidance of the Systems cell for continuous improvement. The following mechanisms are in place at APCW for review of the activities:

- Q Safety audits by NSC
- Q Audits by safety committee members, Task force committee
- Q Cross functional safety audits, internal audits, surveillance audits
- Q Safety training by external agencies
- Q Organizing safety day /electrical week/MEMC week/World Environment day etc
- Q Safety themes for month, weekly safety programs
- Q Control indicators for shop floor teams for tracking monthly

Various initiatives for promoting Health and Environment are as mentioned under:

HEALTH INITIATIVES	ENVIRONMENTAL INITIATIVES
<ul style="list-style-type: none">Ø Annual Medical Check-upØ Spirometry TestsØ Audiometry TestsØ Vision TestsØ Immunisation campsØ Specialist Health Check-ups like Orthopaedic, Cadiology, ENTØ Specialist visits in Paediatrics, Orthopaedics, Dental disciplinesØ Guest LecturesØ Anti-malarial tablet distributionØ Disposal of medical waste as per PCB normsØ Audiometry and Vision Tests for Contract LabourØ Annual health check-up for Children	<ul style="list-style-type: none">Ø Disposal of medical waste as per PCB normsØ Tree PlantationØ Sewerage Treatment PlantØ Restricting the usage of PlasticsØ Sprinkler Irrigation for Lavs in TownshipØ Water conservation measures like restricted supply of water in the township, providing push cocks to tapsØ Drip irrigation for TreesØ Construction of Check DamsØ VermicultureØ Concreting and blacktopping of roads to avoid dust

Various Initiatives for improving Safety at UTCL, APCW

- ü Permit to work system implemented
- ü Testing: pressure vessels & lifting tools
- ü Fire survey organized
- ü PPE standardization done
- ü Excavation permit introduced
- ü Fire extinguishers streamlined
- ü Periodical checking of extinguishers
- ü First aid boxes as per the statutes
- ü Training on first aid
- ü SHE assessment of contractors
- ü Mock drills as per ONSEP plan
- ü Fitness check of private vehicles inside factory premises
- ü Training on first aid
- ü 5 minutes safety talks
- ü Periodical maintenance of smoke detection system
- ü Reporting & rewarding for near miss incidents
- ü Visual controls established
- ü Sub-stations 5S audits
- ü Awareness -fire fighting & ONSEP

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