

Company profile in brief

- Manufacturer of bulk cephalosporin range of products (antibiotics), Intermediates and Neutraceuticals with two sophisticated manufacturing facilities in India (one at Alathur near Chennai and the other at Aurangabad)
- Our Alathur facility has a work force of over 1200 and a turnover of Rs.690 crores
- Largest manufacturer of Cephalosporin products in India and one among the top five in the world
- 100% EOU with ISO 9000, ISO 14000, US-FDA, TGA and EDQM certifications

Nature of manufacturing

- Cephalosporin manufacturing is based on low temperature technology upto -70°C
- Approx. 2500 TR equivalent of refrigeration systems operated at various temperatures (+7, -10, -25, -30, -40 & -70)
- Energy cost is approx. 5% of the turnover
- Manufacturing operations are batch-wise
- A typical manufacturing process stream is as under:

Reactors → Centrifuging → Drying → Powder Processing →
Cold Storage → Despatch

Energy scenario

- We have our own CPP (3 x 3.38 MW) to meet our power requirements and 4 Nos. of FO fired boilers and 3 Nos. of WHRBs to meet our thermal energy requirements (550 TPD of steam per day)
- Our fuel bill comes to approx. Rs.35 crores per annum (40% for Utility, 40% for ETP and 20% for process)
- We have been consistent in reducing the specific energy consumption by 5% every year for the last 3 years with a dedicated team working for energy conservation

Energy Conservation Approach

- Invest on new energy efficient systems
- Continual improvement in operational efficiency by innovations
- ENCON techniques adopted:
 - Soft starters in power intensive drives
 - FRP blades in cooling tower
 - Lowering condensers in distillation plants
 - Control on compressed air velocity
 - Primary pump elimination in refrigeration
 - Star connection in lower loaded drives
 - Optimization of generation voltage and frequency in CPP (11 KV, 50 Hz 10.7 KV, 49.46 Hz)
 - Optimization of refrigeration set temperature
 - 95% steam condensate recovery
 - Recycling reactor jacket water as CT make up
 - Routine air leak and insulation audits

Energy conservation by conserving water

- Orchid, being a 'Zero Discharge Unit', adds value to water by 100% recycling
- Saving 150000 KL of water/ annum by recovering water from effluent using UF and RO
- By using air cooled heat transfer equipment, evaporation loss of 75000 KL/year is avoided
- A major part of CT make up water is obtained from: Defrost water, container wash water, AHU humid water, water ring vacuum pump expel water, hot water tank overflows, reactor jacket drainings etc.
- Providing orifices before the water usage points

All the above resulted in the reduction of specific water consumption by 40 lit/kg of product

Energy conservation : Generation & Demand side

S.No.	Generation side	Demand side
1	CPP: Heat recovery enhancement by adding WHRB, RCC chimney and economiser = Rs.27 mio/annum Voltage in frequency optimisation = Rs.5 mio/annum	Star conneciton, soft starters, VFDs, capacitor banks, lighting transformers, electronic ballest = Rs.5 mio/annum
2	Boiler: RCC chimney with economiser, Dunphy burner and efficiency enhancement by 6% = Rs.6 mio/annum 95% steam condensate recovery = Rs.10 mio/annum	Regular insulation audits, leak audits, flash steam recovery, multiple effect evaporators. = Rs 2 mio/annum
3	Air compressors: Velocity optimisation, pressure drop reduction, level based traps, air temperature reduction, nitrogen production enhancement, V belt to flat belt = Rs.5 mio/annum	Leak audits, LP nitrogen usage for blanketing, transvector nozzle = Rs.1.5 mio/annum
4	Refrigeration/CT: Optimisation of set point, primary pump aversion, FRP blades = Rs.1 mio/annum	Increasing the loading % by rearranging the client reactors, insulation audits, lowering the condensers = Rs.6.5 mio/annum
5	Water/Effluent: 100% recovery of water from effluent 16% reduction in specific water consumption	Reduction of evaporation loss, reuse of waste water for cooling tower make up
	Total savings: Rs.55 mio/annum	Total savings: Rs.15 mio/annum
GRAND TOTAL: Rs.82 mio/annum		

Selection of energy efficient burner for boiler

- The co-axial energy efficient burner supplied by Dunphy, UK trims the excess oxygen level closer to 1.5%
- Reduction of excess oxygen from 3% to 1.5% has facilitated the reduction of air for combustion by 6.5%
- As oxygen is trimmed, the air requirement for complete combustion gets reduced and thereby, reducing the heat loss carried away by flue gas
- Basis: 1100 lit/hour of FO combustion
6.5% of total air equals to 1200 kgs/hour
Sensible heat loss avoided = 45000 Kcal/hour
= 5 litres of FO/hour

Efficiency enhancement in heat recovery - CPP

- 2000-01: The overall efficiency (on heat recovery basis) at our CPP was 35.5%
- 2001-02: With WHRB the overall efficiency became 43.7%
- 2002-03: With RCC chimney and an additional economizer the efficiency reached 49.5%
- 2003-05: With our future proposal for hot water fired VAS in the HT circuit of CPP the efficiency would reach 60%