

Asian Paints Limited, Patancheru (Andhra Pradesh)

Company Profile

Asian Paints Limited, Patancheru plant manufactures decorative and industrial paints, resins and varnishes. The plant was setup in 1983 and has expanded, over the years, to a total capacity of 80000 KL of paint per annum as on date. Asian Paints is the leading decorative paints company in India and has various units operating in the Asia-Pacific, the Middle East, etc.

Energy Policy

We are committed to continuously improve energy efficiencies in all our manufacturing processes.

To achieve our goal we shall:

Treat energy as one of the very vital inputs to our manufacturing processes.

Measure energy consumption, benchmark and monitor against entitlements.

Review and update entitlements at least once in a year.

Continuously explore and implement energy conservation technologies and practices. This will include opportunities to use renewable energy.

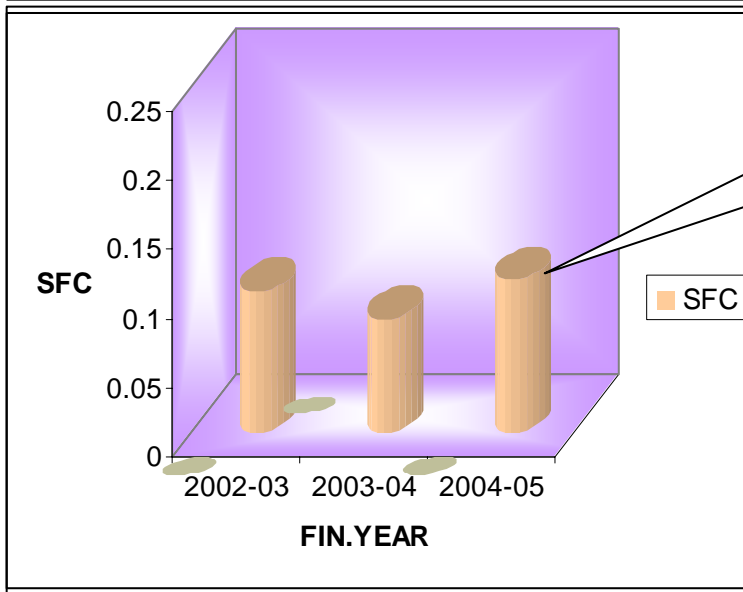
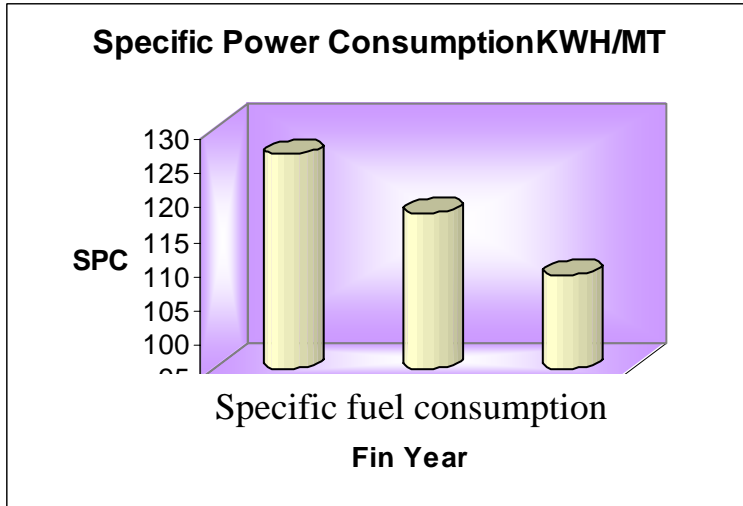
Enrich our experience and knowledge by actively participating in energy conservation forums to promote and exchange best practices.

Promote awareness among all our employees and their families about the need for energy conservation.

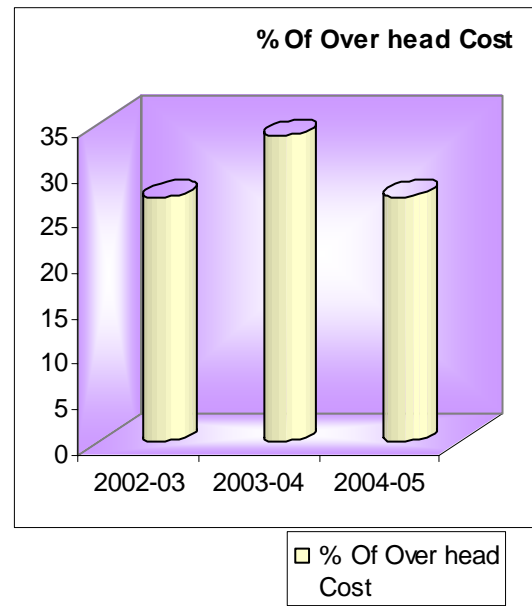
Energy Consumption

Specific power consumption details	Unit	2002-03	2003-04	2004-05
Annual Production	MT	66496	70384	73792
Total Electrical Energy consumption per annum	Kwh (lakhs)	84	82.89	80.22
Total Thermal Energy consumption	Million K Cal	6757.35	5775.35	8132.87
Total Manufacturing cost in rupees.	Lakhs	1830.63	1961.60	2207.85
Total Energy cost in rupees.	Lakhs	508.702	511.458	587.498
Energy cost as percentage Manufacturing cost	% age	27.09	33.9	27.14
Specific Power Consumption	KWH/MT	126.32	117.77	108.71
Specific Thermal Energy Consumption	MK Cal/MT	0.102	0.082	0.110

Graphical Representation of Specific Energy Consumption



MKcal/Ton has increased because of increase in production of higher cycle time Industrial Resin by 47% w.r.t 2003-04.

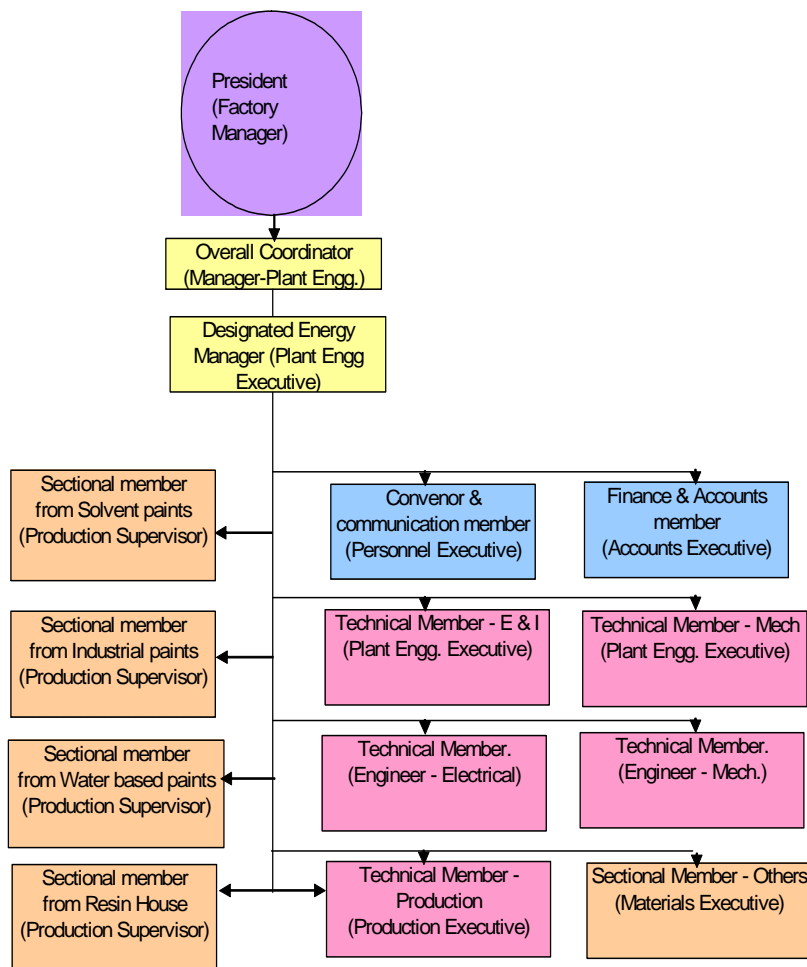


Energy Conservation Commitment and Set-up

Energy Conservation is identified as one of the plant goals towards continuous improvement. Every year, several activities are taken up to reduce the consumption of various forms of energy. Several awareness campaigns are carried out to nurture attitude towards Energy Conservation as a day-to-day work practice.

The plant has an Energy policy that is modeled with sustainable development as the basis for resource conservation.

Energy Conservation Cell Structure



The Plant Energy Council is the nodal agency for coordinating various Energy Management and Conservation activities. Members are drawn from various sections and all user groups are well represented. The council evaluates the specific energy consumption trends and identifies tasks towards reduction in energy consumption. Reduction in manufacturing cycle times has been a key benefit due to the involvement of user groups in Energy Management.

Energy Conservation Achievements

Over the past few years, rapid strides have been made in improving manufacturing operations. Effective Energy Management Drive has been a key component in the continuous improvement process. As part of this drive, several energy conservation initiatives have been implemented. A total of 39 initiatives have been implemented during the period 2000 – 2005, with energy savings amounting to Rs. 111.61 lakhs. Plans are on the anvil to achieve further reduction in specific energy consumption. An important milestone in the continuous improvement process was achieved in the development of a unique Energy Model.

Major Energy Conservation Projects implemented during the year 04-05

1. Replacement of MLL by CFL lamps

Around 450 no of MLL Lamps that used for path way lighting and shop floor lighting were replaced by CFL lamps without compromising on Lux levels. The lux level with MLL lamp was measured and to match that Lux level CFL lamps were selected. On trial basis data of Lux level was collected for a month. After confirming the compliance of lux levels to old value, all 450 numbers were replaced with CFL Lamps. At required places the luminaries height was also reduced to get sufficient illumination

Energy savings per annum	:	225000 KWH
Savings in Rs.per annum	:	9.0 Lakhs
Investment made	:	1.15 Lakhs
Pay back	:	1.5 months



2. Installation of Air pre heater for thermic fluid heater

The Exhaust gas of a thermopac was at 300 deg Celcius. This waste heat was unrecovered. On discussing with the supplier M/S Thermax, a preheater was installed. After the installation of the preheater the exhaust gas temperature was reduced to 200 deg Celsius. This waste heat recovery has reduced the fuel consumption by 4%

Energy savings per annum	:	240 Million Kcal
Savings in Rs.per annum	:	5.748 Lakhs
Investment made	:	6.0 Lakhs
Pay back	:	12.5 months



3. Replacement of air compressor with blower in E.T.P

An 18.5 KW compressor was supplying air for process requirement of ETP(after pressure reduction at 0.3 Bar)The same was eliminated by installing a roots blower of 5 KW capacity and thus energy saving to the tune of 12.5 KW was achieved. Following are the details

Energy savings per annum	:	113000 KWH
Savings in Rs. per annum	:	4.52 Lakhs
Investment made	:	1.2 Lakhs
Pay back	:	2.6 months



4. Time switch to eliminate the running of Forced Draught fan during shift change over timing.

A forced draught system with a total capacity of 81 kw was operating round the clock. Actually this was required when operators were present in the shop floor and while they do processing. During shift change overs we confirmed that absolutely there was no need of operating this system since there were no operators and no processing activity. After this study, with a Real time switch we have automated the Starting and Stopping of the equipment during shift change overs. Following are the details

Energy savings per annum	:	65600 KWH
Savings in Rs.per annum	:	2.625 Lakhs
Investment made	:	0.003 Lakhs
Pay back	:	0.5 day



5. Cyclic timers for Water base paint block hopper equipment.

Finished Product was finally stored in an intermediate vessel called hopper. From that hopper paint was packed in retail packs. The agitator in the said hopper used to run continuously. An idea of intermittently running the agitator with a cyclic timer got evolved. By cyclically switching ON and OFF of the agitator it was confirmed that quality of the product remains same. Based on the above fact around 10 cyclic timers were installed for 10 agitators. By this the on time got reduced by 50% per batch. Following are the details

Energy savings per annum	:	61000 KWH
Savings in Rs.per annum	:	2.44 Lakhs
Investment required	:	0.10 Lakhs
Payback	:	15 days



6. Reducing the running hour of compressor system by optimizing the temperature setting of 20 Ton chiller

The 20 TR chilling system was running at the rate of 22 hrs per day with a trip setting of 14 deg. Celsius and 16 deg Celsius. Process requirement was found to be 30 deg. Celsius. To meet this process requirement chilled water temperature at 18 deg. Celsius was sufficient. Hence we have optimized the temperature setting to 18 Deg -20 Deg Celsius. By this operating hours of the chiller has come down resulting in Energy saving. Following are the details

Energy savings per annum	:	49500 KWH
Savings in Rs.per annum	:	2.16 Lakhs
Investment required	:	0 Lakhs



7. Replacement of inefficient copper chokes by efficient electronic chokes

Tube light to the population of around 1000 in the plant had inefficient copper chokes which was consuming around 20 watts each 250 numbers of tube lights were switched ON round the clock . Other 750 lamps were used @ 12 Hours per days Hence in phase I we have replaced these copper chokes with electronic chokes (in order to get the early benefits)All 250 Chokes were replaced with electronic chokes and performance was found to be satisfactory.Pase II and Phase III we have plans to replace other chokes also.

Following are the details

Energy savings per annum	:	50000 KWH
Savings in Rs.per annum :	2.0 Lakhs	
Investment required	:	1.42 Lakhs
Payback	:	8.5 months



8. Ref Air drier for Compressed air Ref Air drier for Compressed air

Around 350 cfm of air got dried through an adsorbent type air dryer. During every regeneration 15% of dry air was vented out to atmosphere in the process of regeneration. With the advent of new technology a new refrigerated air dryer was installed and system was found to be energy efficient by elimination of the air wastage(that was vented out to atmosphere in our old system.)

Energy savings per annum	:	41300 KWH
Savings in Rs.per annum :	1.65 Lakhs	
Investment required	:	1.85 Lakhs
Payback	:	14 months



9. A.C drive for RC 25 air compressor

The compressed air requirement of the plant was met with one 9X7 compressor of 240 CFM and one RC 25 compressor of 250 CFM. The average demand observed is 340 CFM and peak demand is 450 CFM. So, one compressor was running in loaded and another in unloaded pattern. We have provided A.C. drive for 2'nd compressor (RC 25 air compressor) and the RPM of the compressor is now varying with respect to the feed back got from pressure transducer instead of running in unloaded condition. Following are the details

Energy savings per annum	:	39000 KWH
Savings in Rs.per annum	:	1.56 Lakhs
Investment required	:	3.0 Lakhs
Payback	:	23 months



10. Cyclic timers for Window A.C 's

All the window A/C's were found to run continuously with lower thermostat settings. A cyclic timer was installed with ON time as 20 Min and Off time as 5 Min for all the window A/C's to control the compressor This setting was optimized by Eng department based on seasons. Good energy saving was achieved by installing this timer for 33 A/C's.Following are the details

Energy savings per annum	:	38750 KWH
Savings in Rs.per annum	:	1.55 Lakhs
Investment required	:	0.60 Lakhs
Payback	:	4.6 month



Other Encon Activities of 04-05				
S.NO	Encon Activities	Kwh savings/Annum in Lakhs	Savings in Lakhs/Annum	Investment in Lakhs
11	Utilization of existing cooling tower which is under loaded in other area and avoided the running of dedicated cooling tower for 36 Ton chilling plant	0.32	1.30	0.10
12	Elimination of cold well pump running by utilizing the hotwell pump by removing the cold well and hotwell concept in 36 Ton chilling plant	0.31	1.27	0.10
13	Energy efficient agitator for 12 KL mixer	0.31	1.25	1.00
14	Energy efficient gear box in place of Worm and worm gear box	0.31	1.24	0.80
15	Regrouping/Illumination based lighting control	0.22	0.86	0.23
16	Demand based auto cut-off of cooling tower pumps	0.10	0.38	0.02
17	Reducing the running hour of compressor system by optimizing the temperature setting of 36 Ton chiller	0.09	0.36	0.00
18	Cyclic timers for under utilized ventilator exhaust fans	0.08	0.31	0.10
19	Interlocking condenser fan with compressor of 33 Ton chiller	0.08	0.30	0.00

Energy Conservation Plans and Targets

Energy conservation is a continuous process. Several projects have been identified to reduce the specific energy consumption, resulting in total annual estimated savings of Rs.60.17 lakhs against an investment of Rs.58.58 lakhs. A list of identified projects is given:

Energy Conservation Measures (Planned)	Anticipated savings in		Approx. investment (Rs.lakhs)	Project Commencement & Completion year	
	Energy Value				
	(KWH in Lacs)	Million Kcal			
Solar energy for lighting and heating applications.	0.28		1.12	10	2006-07
Power quality improvement	7.5		30	35	2006-07
Energy efficient agitator for continuously run high rated motors.	3.76		15	10	2005-06
Flat Belt System for Blowers of Forced draught ventilation system	0.14		0.56	0.02	2005-06
Coversion of Backward Flat blades to Backward curved blades to maximise the Efficiency	0.14		0.56	0.5	2006-07
Elimination of running of additional pump in WBU cooling tower.	0.216		0.86	0	2005-06
Interlocking of cooling tower pump with process equipment to avoid idle running of cooling tower pump in Industrial paint unit	0.105		0.42	0.01	2005-06
Selector switch option for two cooling water pumps in resin house to eliminate running of spare pump(Even by mistake)	0.24		0.96	0.05	2005-06
Eliminate running of Cold well pump and use only Hot well pump in Water Based Unit 20 TR chiller.	0.16		0.65	0.2	2005-06
Interlocking of Chilled water valves with process equipment to reduce the load on the pump as well heat load to chiller (by avoiding idle running of pump and chilled water flow through process equipment when it is not in operation)	0.372		1.48	0.5	2005-06
Belzona Internal Coating for cooling tower pumps to increase the efficiency.	0.08		0.32	0.2	2005-06
Modifying Star-Delat circuit of under loaded equipments like sandmills as Star-Delta-Star starters by connecting 'On delay timers'.	0.675		2.7	0.1	2005-06
Acitivity based grouping of CT pumps in New Bazaar to eliminate running of third pump.	0.5712		2.28	1	2005-06
Motor audit and re-sizing of underloaded motors	0.81		3.26	1	2005-06
Total	15.0492		60.17	58.58	

DETAILED WRITE-UP OF 2004-2005 PROJECTS

1. [Replacement of MLL by CFL lamps](#)

Background of the project

Most of the luminaries in the plant had MLL Lamps. .

Observation made

The power consumed was more also heat generation and failure rates were high.

Technical and financial analysis

On sample basis CFL lamps were installed and LUX level was compared with MLL Lamp data. The LUX level of CFL lamps was found to be sufficient.

Implementation

Around 450 no. of CFL Lamps were installed in place of 160 W MLL Lamp without sacrificing the LUX level by suitably reducing the height of the luminaries and with CFL Lamps.

Energy savings per annum	:	225000 KWH
Savings in Rs.per annum	:	9.0 Lakhs
Investment made	:	1.15 Lakhs
Pay back	:	1.5 months

Before



After



2. [Installation of Air pre heater for thermic fluid heater](#)

Background of the project

A thermopac of 20 Lac Kcal was run for 340 days per year.

Observation made

The exhaust gas temp was around 300 deg. Celsius. This waste heat was unrecovered.

Technical and financial analysis

A detailed study was made with M/S Thermax and it was proposed to install an Air Pre-heater to utilize the waste heat

Implementation

Air Pre-heater was installed and commissioned. The exhaust gas temp was reduced to 200 deg. Celsius and by pre-heating of the air reduction in fuel by 4% was achieved. The same was monitored for a month and this is being sustained.

Energy savings per annum	:	240 Million Kcal
Savings in Rs.per annum	:	5.748 Lakhs
Investment made	:	6.0 Lakhs
Pay back	:	12.5 months

AIR PRE-HEATER INSTALLED IN THERMOPAC



3. [Replacement of air compressor with blower in E.T.P](#)

Background of the project

A reciprocating compressor of 18.5 KW was supplying air to an aerator in ETP.

Observation made

It was found that pressure was applied after a pressure reduction at 0.5 bar

Technical analysis

During our regular rounds an idea of replacing the reciprocating compressor with twin lobe blower arised. On consultation with a supplier and after proper sizing a twin lobe blower of 7.5 KW was ordered.

Implementation

The twin lobe blower was installed and all process parameters were checked and found to be satisfactory. Good energy conservation was achieved.

Energy savings per annum	:	113000 KWH
Savings in Rs. per annum	:	4.52 Lakhs
Investment made	:	1.2 Lakhs
Pay back	:	2.6 months

TWIN LOBE BLOWER IN ETP



4. [Time switch to eliminate the running of Forced Draught fan during shift change over timing.](#)

Background of the project

Forced draught system consists of five fans of total capacity 81 KW. The need of the system is to maintain positive pressure during production activities to remove the solvent vapors that gets evolved during processing .

Observation made

In a day there were three shift changeovers and during this time, there was no need of this system to run

Technical analysis

It was decided to automatically stop the system and start the system during these three shift changeovers by a real time switch.

Implementation

A real time switch was installed and programmed for various shift changeover timings, the output of this real time switch was interlocked with the forced draught system to automatically start and stop as per the said timings.

Energy savings per annum	:	65600 KWH
Savings in Rs.per annum	:	2.625 Lakhs
Investment made	:	0.003 Lakhs
Pay back	:	0.5 day

REAL TIME SWITCH FOR FORCED DRAUGHT SYSTEM



5. [Cyclic timers for Water base paint block hopper equipment.](#)

Background of the project

Finished Product was finally stored in an intermediate vessel called hopper . From that hopper paint was packed in retail packs. The agitator in the said hopper used to run continuously . During one of the internal energy conversation meet idea of intermittently running the agitator with a cyclic timer got evolved.

Observation made

By cyclically switching on and off of the agitator it was conformed that quality of the product remains same.

Technical and financial analysis

The above was tried in one hopper with a cyclic timer with ON time of 15 minutes and OFF time of 15 minutes . The product Sample from that mixer was analyzed by our QC lab & conformed for good quality.

Implementation

Based on the above fact around 10 timers were installed for 10 hopper's each of 2.2 /5 KW capacity. By this the on time got reduced by 50% per batch.

Energy savings per annum	:	61000 KWH
Savings in Rs.per annum	:	2.44 Lakhs
Investment required	:	0.10 Lakhs
Payback	:	15 days

CYCLIC TIMER FOR ITNERMEDIATE PAINT STORAGE HOPPERS



6. [Reducing the running hour of compressor system by optimizing the temperature setting of 20 Ton chiller](#)

Background of the project

20 TR chilling system was running at the rate of 22 hrs per day at a trip setting of 14 deg. Celsius and 16 deg Celsius

Observation made

Process requirement was found to be 30 deg. Celsius. To meet this process requirement chilled water temperature at 18 deg. Celsius was sufficient

Technical analysis

On trial basis the set point of the temperature controller was increased from 14- 16 deg. Celsius to 18-20 deg. Celsius The process temperature was found to be 26 deg. Celsius which was well within process limitations.

Implementation

On continuous basis the revised temperature settings were maintained and the reduction in running hrs of the 20 TR chilling system was achieved. Running hr was monitored on a continuous basis and the running hr was found to be consistent and system was found to be satisfactory.

Energy savings per annum	:	49500 KWH
Savings in Rs.per annum	:	2.16 Lakhs
Investment required	:	0 Lakhs
Payback	:	NA

TEMPERATURE CONTROLLER OF 20 TR CHILLER



7. [Replacement of inefficient copper chokes by efficient electronic chokes](#)

Background of the project

Tube light to the population of around 1000 in the plant had inefficient copper chokes which was consuming around 20 watts

Observation made

250 numbers of tube lights were required round the clock . Other 750 lamps were used @ 12 Hours per days Hence in I phase it was decided to replace these copper chokes with electronic chokes in order to get the early benefits.

Technical and financial analysis

Electronic chokes which were proven for its energy efficiency were installed & Lighting power reduction was achieved

Implementation

All 250 Chokes were installed & performance was found be satisfactory

Energy savings per annum	:	50000 KWH
Savings in Rs.per annum	:	2.0 Lakhs
Investment required	:	1.42 Lakhs
Payback	:	8.5 months

A view of chokes

Before



After



8. [Ref Air drier for Compressed air](#) [Ref Air drier for Compressed air](#)

Background of the project

Around 350 cfm of air got dried through an adsorbent type air dryer.

Observation made

During every regeneration 15% of dry air was vented out to atmosphere in the process of regeneration.

Technical analysis

With the advent of new technology like Refrigerated type air drying we have decided to install the Refrigerated air dryer. After consulting various suppliers we have ordered for the same.

Implementation

The new refrigerated air dryer was installed and system was found to be energy efficient by elimination of the air that was vented out to atmosphere in our old system.

Energy savings per annum	:	41300 KWH
Savings in Rs.per annum	:	1.65 Lakhs
Investment required	:	1.85 Lakhs
Payback	:	14 months

REFRIGERATED AIR DRYER



9. [A.C drive for RC 25 air compressor](#)

Background of the project

The compressed air requirement of the plant was met with one 9X7 compressor of 240 CFM and one RC 25 compressor of 250 CFM

Observation made

The average demand observed is 340 CFM and peak demand is 450 CFM. So, one compressor is running under loading and unloading pattern

Technical analysis

In order to eliminate the un-loading of second compressor we have taken a trial of varying the speed of the screw compressor with a VFD. By this the no load power of the compressor that was taken during idle running can be eliminated was proved. During trial run it was evident that we could save power at reduced speed. A new VFD of required size was purchased.

Implementation

We have provided A.C. drive for RC 25 air compressor and the RPM of the compressor is varying with respect to the feedback from pressure transducer.

Energy savings per annum	:	39000 KWH
Savings in Rs.per annum	:	1.56 Lakhs
Investment required	:	3.0 Lakhs
Payback	:	23 months

VARIABLE FREQUENCY DRIVE FOR RC 25 SCREW COMPRESSOR



10. [Cyclic timers for Window A.C 's](#)

Background of the project

All the window A/C's were found to run continuously with lower thermostat settings .

Observation made

Since all the employees are not continuously occupying the rooms a thought of providing cyclic timers with ON time as 20 minutes and OFF time as 5 minutes was decided in monthly energy conversation meet .

Technical and financial analysis

Three timers were purchased on trail basis & installed on three different rooms and observed for a week after optimizing the ON/OFF time of the timer. Since the comfort level of the occupant has not come down it was decided to extend the same for all the 33 A/C's .

Implementation

Timers were provided all 33 A/C units & timings were optimized based upon the seasons the duration of ON/OFF time of the A/C's are being adjusted by engineering department.

Energy savings per annum	:	38750 KWH
Savings in Rs.per annum	:	1.55 Lakhs
Investment required	:	0.60 Lakhs
Payback	:	4.6 month

CYCLIC TIMER FOR WINDOW A/C'S



11. Utilization of existing cooling tower which is under loaded in other area and avoided the running of dedicated cooling tower for 36 Ton chilling plant

Background of the project

A 36 Ton chiller had a dedicated cooling tower with a fan and pump. Total electrical load was 7.5 KW.

Observation made

Another fan less cooling tower in a near by area was found to be under loaded.

Technical analysis

A thought of utilizing the excess capacity of fan less cooling tower came during our monthly energy conservation meet. On trial basis pipelines and interconnecting valves were provided and a trial was taken with this cooling water. Chiller compressor performance was found to be satisfactory.

Implementation

Required isolating valves were closed and interconnecting valves were opened. The dedicated cooling tower was permanently switched off.

Energy savings per annum	:	32400 KWH
Savings in Rs.per annum	:	1.3 Lakhs
Investment required	:	0.10 Lakhs
Payback	:	27 days

DEDICATED COOLING TOWER WHICH WAS STOPPED



12. [Elimination of cold well pump running by utilizing the hot well pump by removing the cold well and hot well concept in 36 Ton chilling plant](#)

Background of the project

A 15 hp pump for Coldwell and 5 hp pump for hot well was running round the clock in 36 Ton chilling plant.

Observation made

Chilled water requirement for process was found to be continuous at any point in time minimum one of the equipment required chilled water.

Technical analysis

Thought of elimination of Coldwell/hot well bank concept arised during energy conservation meet. By this the hot well pump can be switched OFF and Coldwell pump can be continuously switched ON. This would supply water for both(process and evaporator)

Implementation

Required isolating valves /interconnecting valves/pipelines were provided. The hot well pump was switched OFF and Coldwell pump was made continuously ON.

Energy savings per annum	:	30600 KWH
Savings in Rs.per annum	:	1.27 Lakhs
Investment required	:	0.10 Lakhs
Payback	:	28 days

HOT WELL PUMP WHICH IS IN OPERATION



13. [Energy efficient agitator for 12 KL mixer](#)

Background of the project

A 10 hp agitator was required for a 12 KL mixer.

Observation made

With advent of new technology agitators with hydrofoil design was found in the market.

Technical analysis

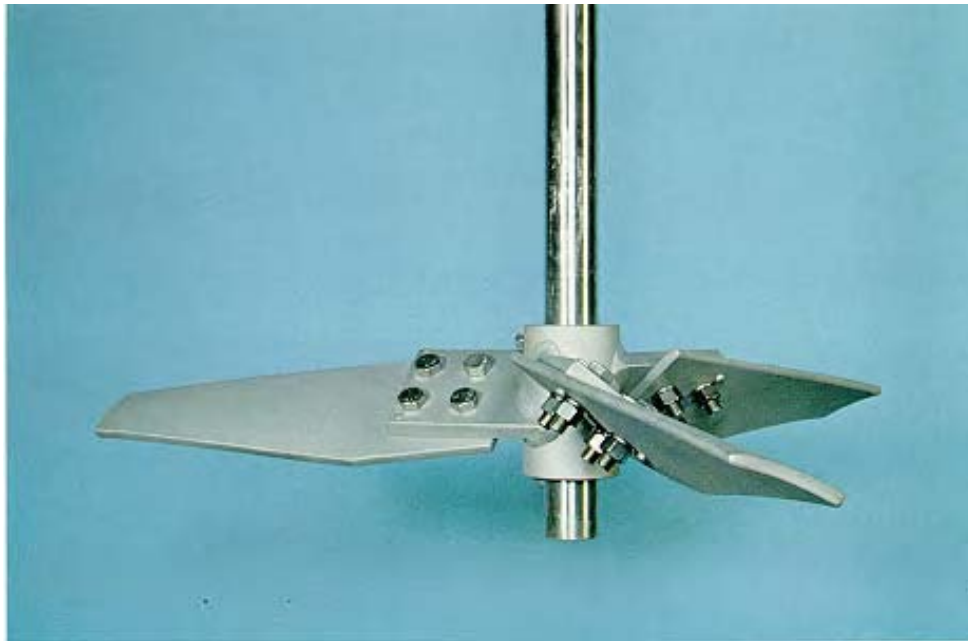
A detailed analysis with the supplier was held. Without compromising on the process parameters energy conservation by downsizing of the agitator was guaranteed by the supplier.

Implementation

The new energy efficient hydrofoil design agitator was installed, commissioned and performance was found satisfactory. This idea would be extended in phase wise for other reactors in next year.

Energy savings per annum	:	31200 KWH
Savings in Rs.per annum	:	1.24 Lakhs
Investment required	:	1.0 Lakhs
Payback	:	9.6 months

HYDROFOIL DESIGNED AGITATOR



14. [Energy efficient gear box in place of Worm and worm gear box](#)

Background of the project

A 10 hp motor with a worm and worm wheel gear box was used for a mixer.

Observation made

High efficient gear box (with helical gear speed reduction) was found in the market.

Technical analysis

Because of the reduction in the torque at motor end in helical gear boxes, energy efficient helical gear based gear box was purchased

Implementation

The new energy efficient gear box was installed in the mixer and torque load and power characteristic were found to be satisfactory with respect to the supplier specification.

Energy savings per annum	:	31200 KWH
Savings in Rs.per annum	:	1.24 Lakhs
Investment required	:	0.8 Lakhs
Payback	:	7.7 months

ENERGY EFFICIENT GEAR BOX



15. [Re-grouping/Illumination based lighting control](#)

Background of the project

During internal plant rounds it was found that all the lights were switched ON. Irrespective of the requirements lights were on

Observation made

The number of switches used for controlling the luminaries was found to be limited. one specific (Darker zone / medium darker zone / Bright zone during availability of natural light) control switches were not present and hence all the lights were found glowing round the clock.

Technical and financial analysis

All the lights were segregated based upon the above said zone Classification also number of switches were increased to decrease number of lights per switch. Photo sensor based automatic ON/OFF control was connected for medium dark zones/brighter zones . The position of sensors were optimized and automatic ON/OFF was found to be satisfactory

Implementation

5 illumination based auto ON/OFF lighting controls were provided for 150 luminaries in 5 areas in 4 blocks

Energy savings per annum	:	21535 KWH
Savings in Rs.per annum	:	0.86 Lakhs
Investment required	:	0.225 Lakhs
Payback	:	3.1 months

Grouping MCB AND Photo Sensor



16. [Demand based auto cut-off of cooling tower pumps.](#)

Background of the project

Based on cooling requirement a second cooling tower pump was switched ON manually .
When the process requirement is met it was switched OFF manually

Observation made

Many times the administrative control was found to be missing and hence second pump was found to run without any requirement

Technical analysis

Thought of sensing the process demand by a differential temp. indicator to monitor the delta T across the cooling tower came during regular energy meet. Based on this delta T second pump's ON/OFF can be automated was discussed.

Implementation

The delta T controller was installed and the second pump ON/OFF was controlled by this controller. This automation has eliminated the manual error and extra running of second pump was avoided.

Energy savings per annum	:	9500 KWH
Savings in Rs.per annum	:	0.38 Lakhs
Investment required	:	0.02 Lakhs
Payback	:	19 days

Delta T Indicator/ Controller



17. Reducing running hr of chilling compressor by optimizing the temp. setting of 36 Ton chilling plant.

Background of the project

36 TR chilling system was running at the rate of 16 hrs per day at a trip setting of 8 deg. Celsius and 10 deg Celsius

Observation made

Process requirement was found to be 25 deg. Celsius. To meet this process requirement chilled water temperature at 16 deg. Celsius was sufficient

Technical analysis

On trial basis the set point of the temperature controller was increased from 8-10 deg. Celsius to 14-16 deg. Celsius The process temperature was found to be 21 deg. Celsius which was well within process limitations.

Implementation

On continuous basis the revised temperature settings were maintained and the reduction in running hrs of the 36 TR chilling system was achieved. Running hr was monitored on a continuous basis and the running hr was found to be consistent and system was found to be satisfactory.

Energy savings per annum	:	9000 KWH
Savings in Rs.per annum	:	0.36 Lakhs
Investment required	:	0 Lakhs
Payback	:	NA

TEMPERATURE CONTROLLER OF 36 TR CHILLER



18. [Cyclic timers under utilized exhaust fans across the plant.](#)

Background of the project

Under utilized exhaust were found to run round the clock .

Observation made

Cyclically switching it ON/OFF for every 15 minutes was decided in Energy conversation meet. On trail basis it was installed for one fan & observed. Deterioration of comfort level was not observed .

Technical and financial analysis

The above was installed for 10 exhaust fan and ON time /OFF time was optimized for all the 10

Implementation

By Grouping 7 timers were provided for 10 exhaust fan and performance found to be satisfactory.

Energy savings per annum	:	7750 KWH
Savings in Rs.per annum	:	0.31 Lakhs
Investment required	:	0.1 Lakhs
Payback	:	NA

CYCLIC TIMER FOR EXHAUST FAN



19. [Interlocking condenser fan with compressor of 33 TR chiller](#)

Background of the project

33 TR chiller was found to run at an average of 14 hrs per day

Observation made

While the compressor was not running the condenser fan was found to run

Technical analysis

Interlocking of the condenser fan with the compressor was thought of and discussed with the original equipment manufacturer.

Implementation

Inter locking was done and extra running of condenser fan for 10 hrs per day was eliminated.

Energy savings per annum	:	7500 KWH
Savings in Rs.per annum	:	0.30 Lakhs
Investment required	:	0 Lakhs
Payback	:	NA

INTERLOCKING OF CONDENSER FAN WITH COMPRESSOR

