



TATA Motors CVBU Pune

Tata Motors is the flagship company of the Tata group with an annual turnover of approximately Rs.17585 Crore for the year 2004-2005. Its product range covers passenger cars, multi-utility vehicles, light, medium and heavy commercial vehicles for goods and passenger transport. Medium and heavy commercial vehicles bear the trusted Tata mark. India's most reliable, dynamic and futuristic automobile manufacturer.

With more than 130 models covering a wide range of Commercial Vehicles, Passenger Cars and Multi-Utility Vehicles, Tata Motors provides the wheels for India's growth. Experience the evolution of an auto giant through a virtual drive

More than half a century of impressive presence and Tata Motors continues to provide India with top of the line commercial vehicles. Tata Motors is India's largest and among the world's top ten commercial vehicle manufacturers.

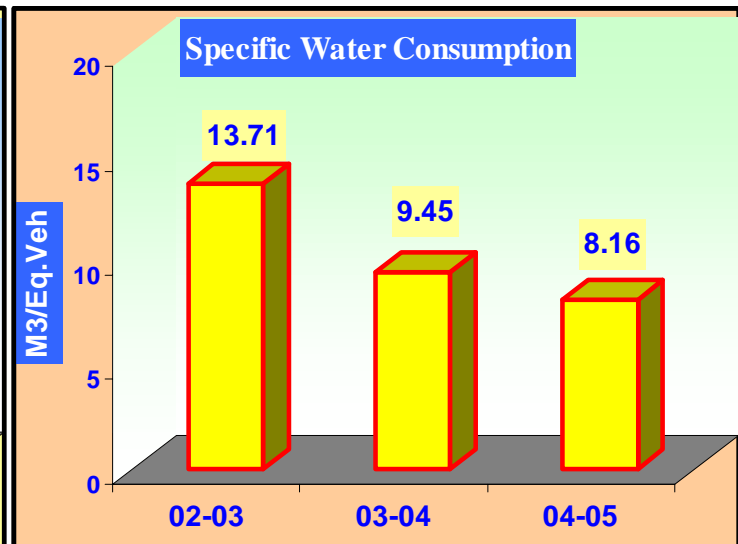
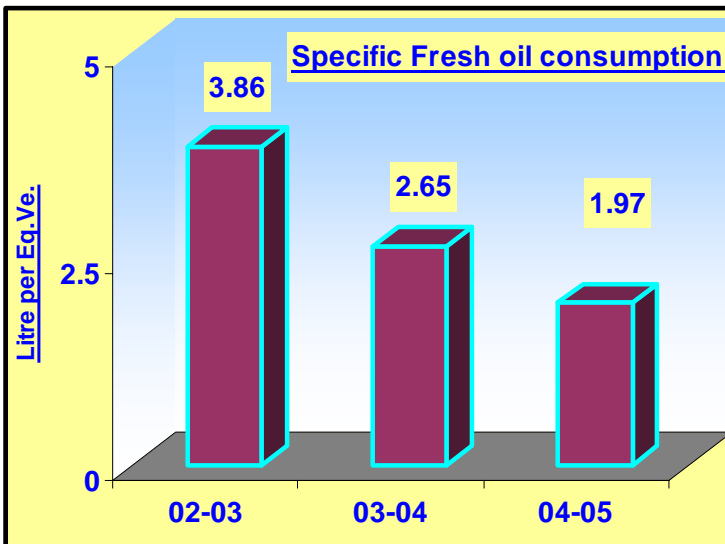
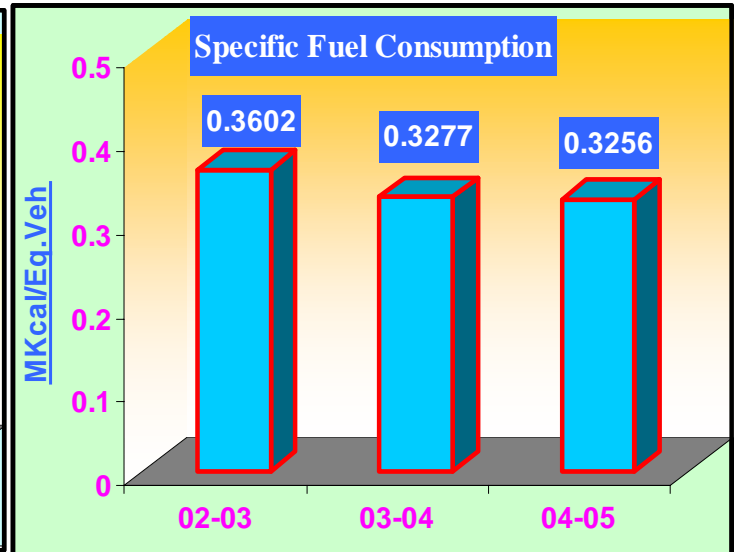
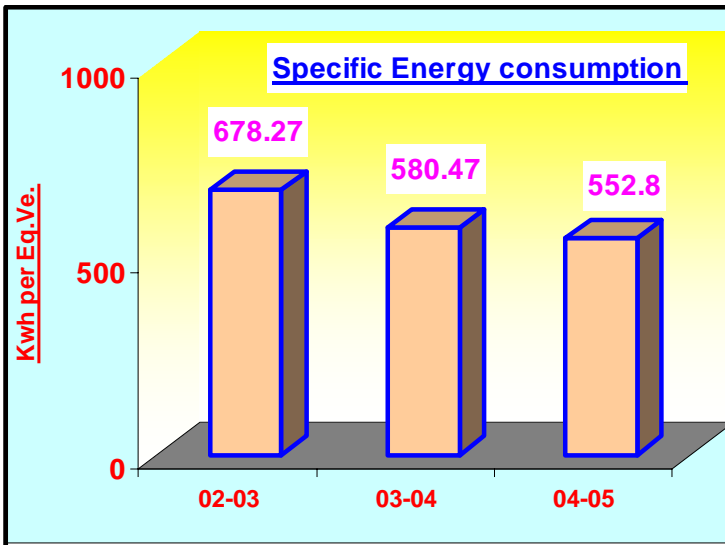
We have over 130 models providing a wide variety of commercial transport solutions. A vehicle for every application - you name it we have it!

(ii) Energy Consumption –

Description	Unit	2002-03	2003-04	2004-05
Annual Eq. Vehicle production	Nos.	114463	164398	218602
Total Electrical Energy Consumption per annum	Lakhs KWH	776.32	954.28	1208.43
Specific Electrical Energy Consumption	Kwh / Eq.Veh.	678.27	580.47	552.8
Total Fuel Consumption per annum	MKcal	41230	53873	71177
Specific Fuel Consumption	Mkcal/Eq.Veh.	0.3602	0.3277	0.3256



Year	Electricity		Fuel		Energy Cost as % of manufacturing cost
	Specific Energy Consum. KWh /Eq.Veh	% Reduction over 2001-2002	Specific Fuel Consum. MKcal /Eq.Veh	% Reduction over 2001-2002	
2002-2003	678.27	Base	0.3602	Base	1.08 %
2003-2004	580.47	14.42 %	0.3277	9.02%	1.00 %
2004-2005	552.8	18.5 %	0.3256	9.61%	0.71%





(iii) Energy Conservation Commitment, Policy and Set up

Energy Policy



TATA Motors, CVBU Pune, is committed to minimise use of Energy and Fuel systematically to optimize the cost of its products, processes and operations, to minimise the adverse impact on environment and to improve the life of people by...

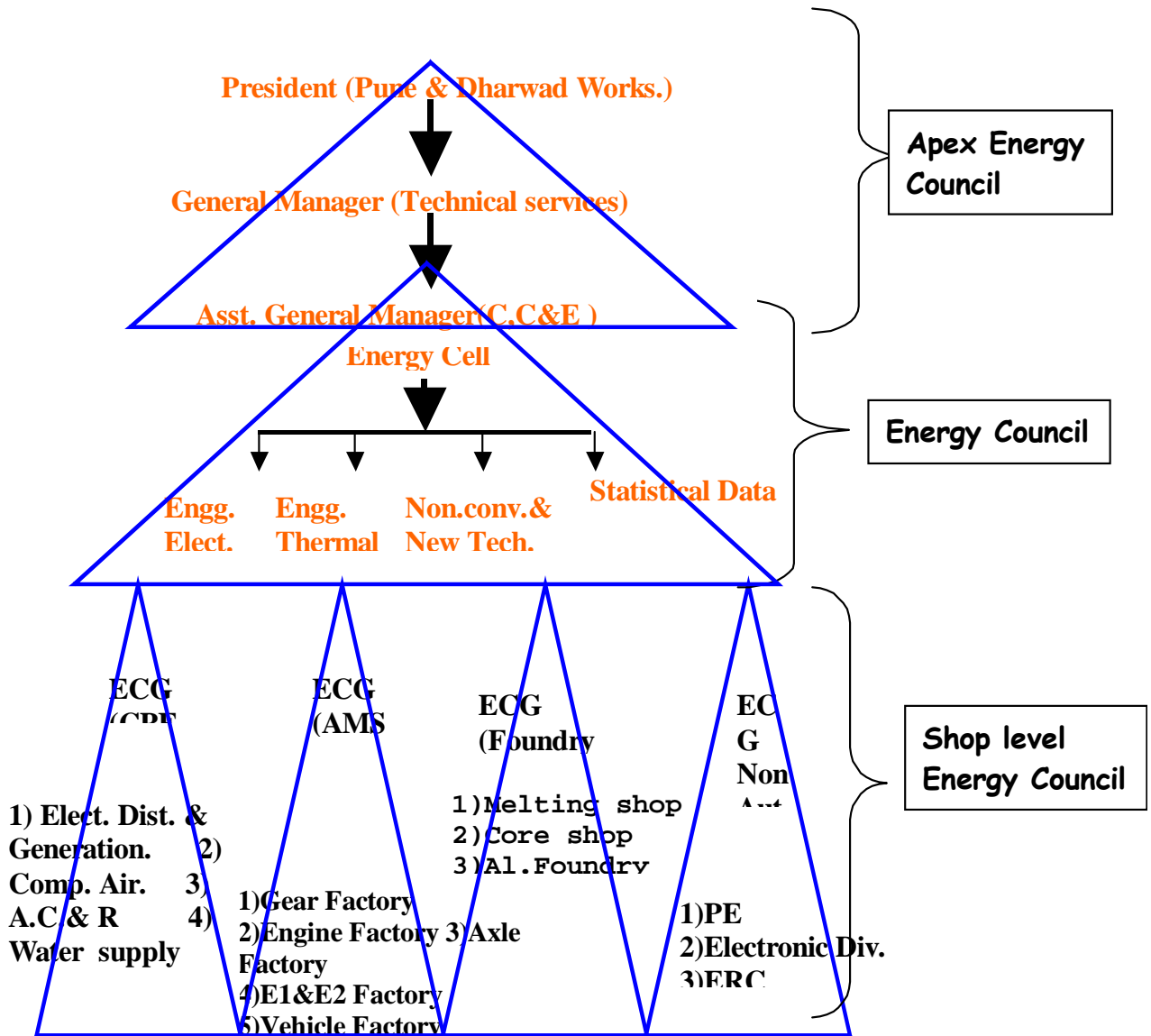
- **Ensuring use of Energy Efficient Alternatives.**
- **Selecting & using Energy Efficient & eco-friendly technology.**
- **Ensuring safe & Energy Efficient operations.**
- **Reviewing, comparing & improving continuously the Specific Energy Consumption of its products, processes & operations.**



TATA MOTORS

Date :- 20.09.2004

P.M. Telang
Sr. Vice President (Operations)



(iv) Energy Conservation Achievements -

During the period 2004-2005, M/s. Tata Motors, CVBU Pune has implemented around 43 energy conservation projects through different initiatives ...

- ✍ Internal Energy audit,
- ✍ Suggestion schemes,
- ✍ Kaizen activity
- ✍ TPM activity
- ✍ Equipment performance monitoring system

Resulting into Savings of Rs.2008 lacs with an investment of Rs. 168.94 Lacs.

Introduction of Computerised Compressor Monitoring System:-

Principle: - EnerAir SX system is a Microprocessor based computerised system, which operate in Auto mode.

- It performance Auto sequencing of reciprocating compressor
- Automatic ON, OFF, LOAD & Unload operation of reciprocating compressor.
- Compressor Load/Unload operation (DELTA P) \pm 2PSI Vis-a vis earlier (DELTA P) \pm 4PSI.
- Eliminated compressor starting delay.
- Energy saving due to auto operation of comp. is 2%

Investment :- Rs.9.09 Lacs

Saving :- Rs. 8.42 Lacs per annum.

Payback:- 13 Months



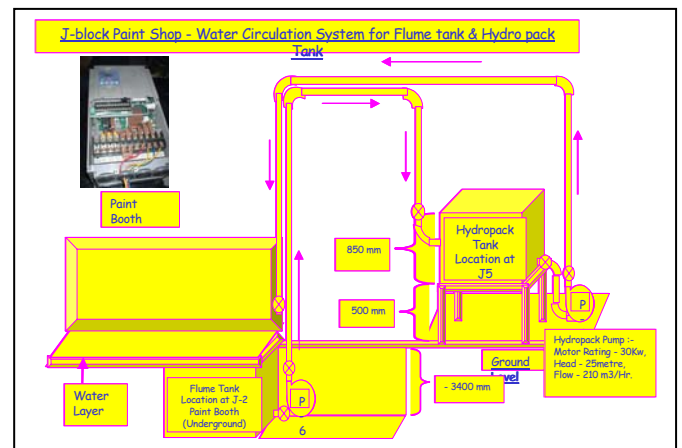
Introduction of Variable Frequency Drives for Hydropack & Flume Tank

Principle: - VFDs are used to maintain the water level of Hydropack & Flume Tanks by operating the Pumps at lower speed. Earlier pumps were operating and maintain the level by throttling the valve of pump delivery result power loss.

Investment: - Rs.5.01 Lacs

Saving: - Rs 2.72 Lac per annum

Payback: - 22 Months



✍ Introduction of RAD-HEAT Gas Heating System for KN-Tempering Furnace.

Principle:- Gas is burnt inside the radiant tubes , which emit the radiant heat to heat up the material in the oven by circulation of air in the oven with Automatic thermostatic controller & maintains oven temperature automatically within +/- 3°C.

This type of installation of Gas Heating system for tempering operation is 1st Installation among Automobile Industries in Indai.

Investment: - Rs.3.75 Lakhs

Saving: - Rs. 2.51 Lakhs per annum

Payback: - 18 Months

After Installation:- Rad-Heat Gas Heating system Exhaust Blowers & Burner with controller



Before - KN Tempering Furnace at HT shop with Electrical heating system



✍ Introduction of Transvector Nozzles for compressed Air cleaning application:

Principle:- Transvector nozzles are operating on the principle of "COANDA Aerodynamic" which sucks the atmospheric air with compressed air.

This helps to reduce the compressed air consumption as well as Noise reduction.

Location: - Niigata machine & Krauseco machine at at H8 basement for dip hole cleaning and surface cleaning H-block.

Investment: - Rs.0.2 Lakhs

Saving: - Rs2.33 Lakhs per year

Payback: - 1 Month

Compressed air consumption is reduced by 33-60% & noise level also reduced by 8- 12db.

Before - Cleaning of 4DL cylinder head with OLD Type cleaning



Noise Level 106.2 dB

After - Use of Ex Blow gun during 4DL cylinder head cleaning



Noise Level 93.7 dB

Use of Variable Frequency Drives for Heat Supply blower of Paint Baking Oven :-

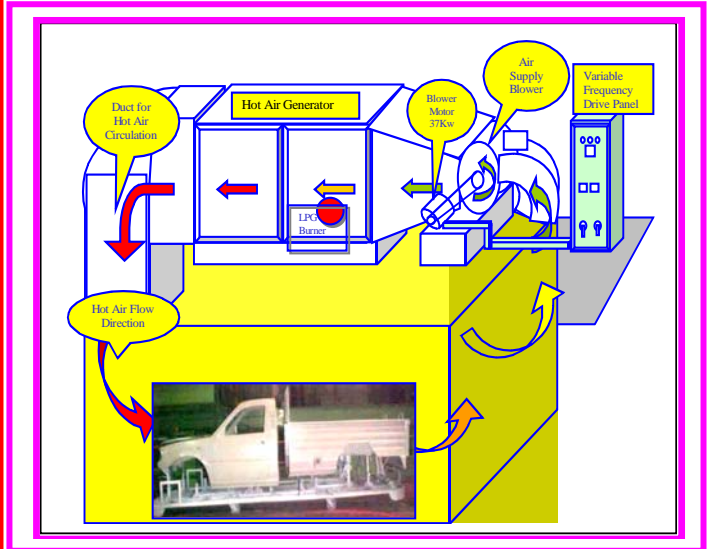
Principle :- VFD is used for Hot Air Circulation Blower of Paint Baking Ovens at J-block Paint shop as per LPG burner heat output. Earlier blower was operating at constant speed irrespective of burner heat output results in power loss.

Location:-CED, Sealer, Surfacer & Finish Oven Heat Supply blower J-blk Paint shop.

Investment: - Rs.42.98 Lacs

Saving :- Saving in Rs. 23.32 Lacs per annum

Payback:- 22 Months



Introduction of water back flushing system for Reciprocating Compressor :-

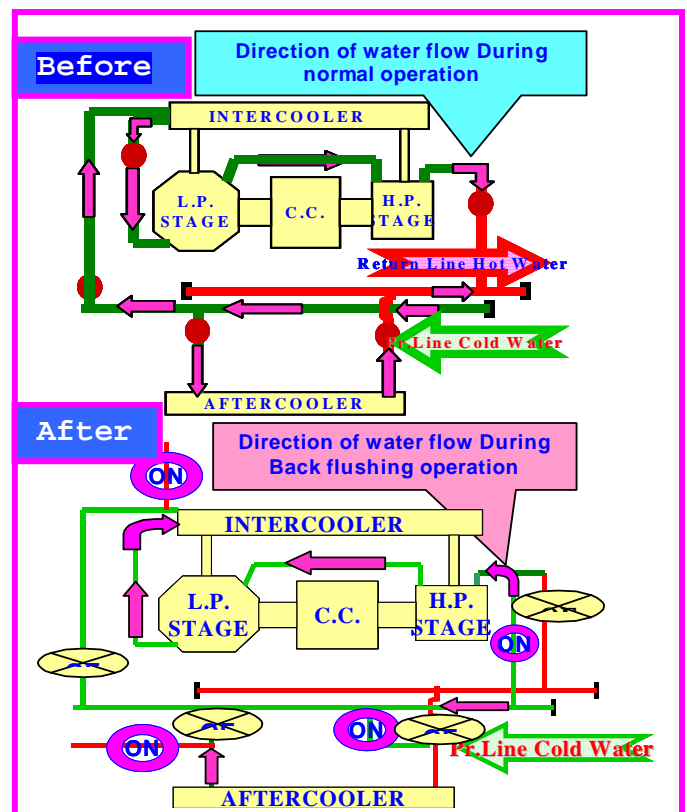
Principle:- In view of improvement in Compressor performance, compressor water circulation system is modified. Earlier Intercooler & after cooler were cleaned whenever 2nd stage inlet and outlet temperature was increased & some times compressor was not available for schedule maintenance of inter cooler & after cooler, results in more power was required to generate compressed air.

After modification, when ever compressor is off for short duration, intercooler & after cooler of compressor are cleaned with out waiting for schedule maintenance by passing pressurized water flow in reverse direction as shown in flow diagram

Investment: - Rs. 0.1 Lacs

Saving: - Rs. 0.34 Lacs

Payback: - 4 Months



S r. N	Item Description	Before Back Flushing Modification	After Back Flushing Modification
1	Compressed Air Temp. after Inter-cooler	Avg. 41 °C	Avg. 37.8 °C
2	Compressed Air Temp. after After-cooler	Avg. 36 °C	Avg. 34.5 °C
3	Inter & After Cooler Maint. time reduction	18 Mandays	2 Hrs.
4	Compressor Reliability on account of I/C & A/C		100 %
5	Compressed Air Quality		Improved
6	Energy Consumption reduction		8426 Kw h/Comp/annum

At Paint shop , AED oven earlier thermic fluid indirect heating system was in operation . In view of introduction of efficient way of operation, oil fired heating system is introduced.

Total Investment :- Rs.20 Lacs

Burner capacity :- 5 Lac Kcal / hr.

Total Fuel saved :- 28 KL / annum

Payback :- 39 Months



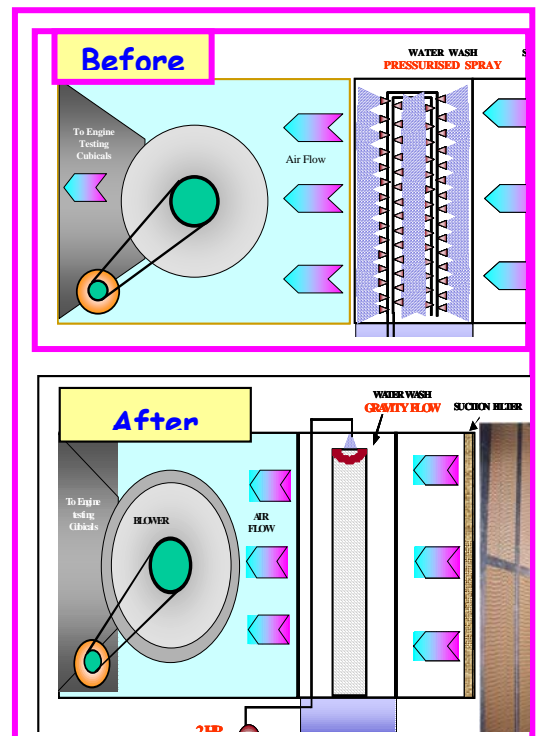
Energy Saving by introduction of Cellulose filter provided for cooling & filtering of fresh air.

Principle: - For filtration & cooling of fresh air supplied to Engine testing cubicles, pressurized water shower was used. It was provided with 15 Kw motor for pumping water. New Cellulose filter provided for cooling & filtering of fresh air, which requires only dripping of water on filters. Hence, it is provided with only 1.5 Kw motor for pumping water

Investment: - Rs.3.6 Lakhs

Saving: -Rs.4.50 Lakhs per annum

Payback: - 10 Months



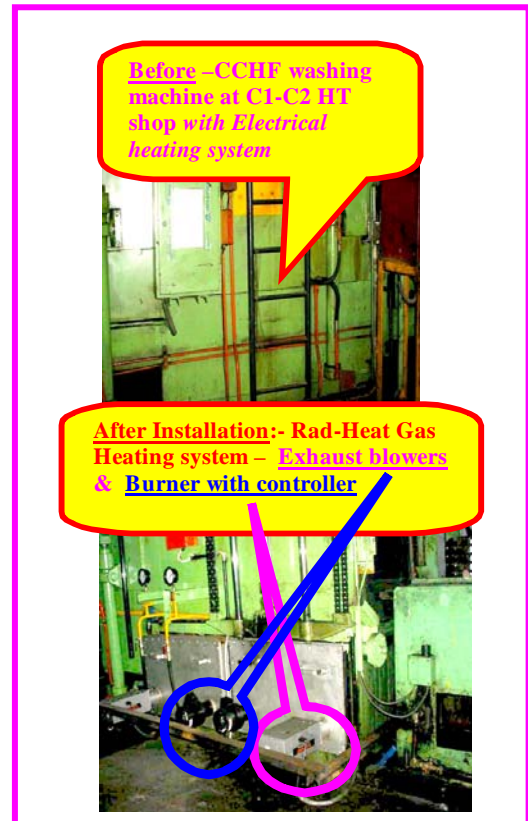
✍ Introduction of RAD-HEAT GAS Heating System for CCHF Washing Machine :

Principle:- Radiant tube of 4" diameter is placed directly in the tank, where water heating is required. Gas is burnt inside the tubes, which emit the radiant heat to heat up the water in the tank. After achieving the desired temperature, Rad-heat burner works on thermostatic controller & maintains water temperature automatically within +/- 3°C.

Investment: - Rs.10.59 Lakhs

Saving: - Rs. 12.1 Lakhs per year.

Payback: - 10 Months



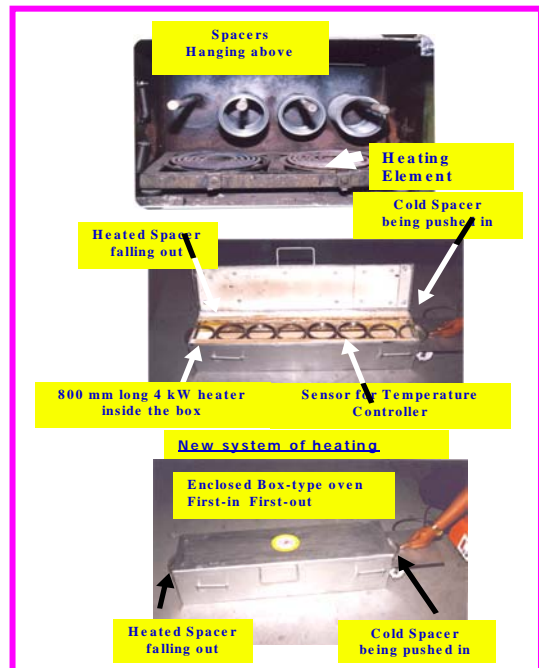
✍ Use of Modified Efficient Oven for spacer heating :

Principle:- Spacers of Stub-axle are required to heat before fitting. Spacers were heated on open hot plate. This was inefficient heating method, results in 3Kw heaters remains ON continuously

Investment: - Rs.0.1 Lakhs

Saving Rs. 0.5 Lakhs per year

Payback :- 2 Months



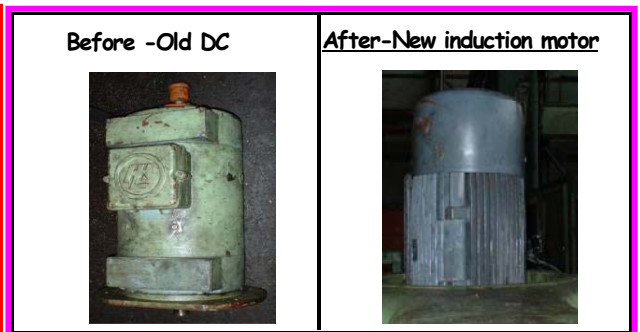
✍ Replacement of DC motor by Induction Motor with AC Drive:-

Earlier Motor-Generator were used for generating & running D.C.Motor Now DC motor & Motor Generator set is replaced by Standard Induction motor with A.C control drive for speed control.

Investment :- Rs.2.0 Lakhs

Saving :- Rs. 1.32 Lakhs per year for 15 m/cs.

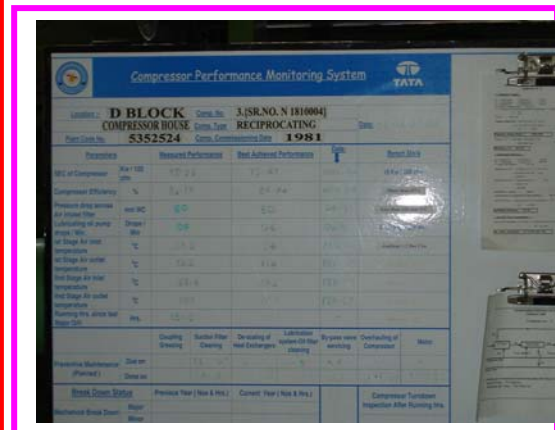
Payback :- 18 Months



✍ Introduction of Compressor Performance Monitoring System :-

Compressor performance monitoring system covers performance of...

- ✍ Intercooler ,
- ✍ after cooler,
- ✍ Air Intake Filter
- ✍ Water let & outlet temperature
- ✍ Air Inlet & outlet temperature
- ✍ Compressor Efficiency
- ✍ Specific Energy Consumption of Compressor



✍ Installation of Solar Water Heating System for Lake House Kitchen 250LPD :

Principle :- Hot water is required for washing the thalis in the kitchen. Earlier water was heated by using boiler. By using Solar Collectors, water is heated and stored in tank and is used as per requirement for washing the thalis .

Location :- Lake House Kitchen 250LPD.

Saving :- Rs. 0.12 Lakhs per year.

✍ Other Energy Conservation Projects implemented during 2004-2005 ...

- Energy Savers for streetlight & Shop lights.
- Conversion of motor connection from Delta connected into permanent star connection at Heat treatment shop .
- Old 4 Nos. 15 Kw heat supply blowers replaced by One 37 Kw blower
- Energy Saver cum welding controller for Weld shop.



- Use of Electronic ballasts.
- Hydro pack elimination.
- Automated door operation for J1 south to eliminate air curtain
- Power Boss Energy Saver for presses
- Downsizing of motors.

(v) Energy Conservation Plans and Targets :-

Energy Conservation Measures (Planned)	Anticipated savings in		Approx. investment (Rs.lakhs)	Project Commencement & Completion year
	Energy Value (specify units)	Rs. Lakhs		
Installation & Commissioning of VFDs for Exhaust blowers at J-blk paint shop.	3.5 Lac KWH	14	28	2005-06
Installation & commissioning of Rad Heat Gas Heating System for Hot water washing machine at C-8 (TMD shop) Pimpri.	2.25 Lac Kwh	9	15	2005-06
Installation & commissioning of Rad Heat Gas Heating System for Tempering Furnace at C1 Heat Treatment shop, Pimpri.	1.0 Lac Kwh	4	6	2005-06
Radiant recuperative heating system for C block Heat Treatment Endo-gas Generators	3.5 Lac Kwh	14	22	2005-06
Intermediate controller for J Block Compressor House.	2.25 Lac Kwh	9	9	2005-06
Replacement of Old inefficient motor by Energy Efficient Motors.	1.0 Lac KWH	4	5	2005-06
Installation & Commissioning of Rad-Heat Gas Heating system for CCHF-9 Washing M/c at Heat Treatment shop Pimpri.	0.756 Lac KWH	3.025	2.15	2005-06
Energy Conservation Measures (Planned)	Anticipated savings in		Approx. investment (Rs.lakhs)	Project Commencement & Completion year
	Energy Value (specify units)	Rs. Lakhs		
Installation & Commissioning of VFDs for welding Gun Water recirculation pump system at J-14 Cub assy. shop	0.6 Lac Kwh	2.4	1.81	2005-06
Installation & Commissioning of VFDs for Primary Effluent system Pump at ETP Pimpri.	0.57 Lac Kwh	2.28	0.71	2005-06
Use of Transvector nozzles for compressed air application to reduce the compressed air consumption.	1.8 Lac Kwh	7.2	0.71	2005-06
VFD for Hot Air Supply Blower of 14 station	1.45 Lac KWH	5.81	12.6	2006-07
VFD for Hot Air Circulation Blower of S-type Baking Oven	1.2 Lac KWH	4.8	11.28	2006-07
VFD for Cooling water circulation pump	0.396 Lac KWH	1.58	2.84	2006-07
VFD for Hot water pump	0.488 Lac KWH	1.95	3.52	2006-07



VFD for Hot Air Circulation Blower of PT New Baking Oven	0.53 Lac KWH	2.11	7.01	2006-07
Reduce the speed of room exhaust blower No.4 and avoid damper control.	0.213 Lac Kwh	0.85	0.15	2006-07
Optimize operation of paint circulation pumps is electro phoretic section in E-blk.	1.25 Lac Kwh	5.01	8.00	2006-07
Reduce the generation pressure of compressed air by segregating J-blk from central comp.hse.	2.5 Lac Kwh	10.00	15.00	2006-07
Replace existing old compressors by new efficient compressors.	13.75 Lac Kwh	55.00	80.00	2007-08

In addition to above Energy Conservation activities other activities like Equipment wise performance monitoring, Energy Kaizen will continue. By adopting above Energy Conservation measures, TATA Motors, CVBU Pune will be able to achieve the set target of 530 Kwh/ Eq. Veh by the year 2006.