



COMPANY



Company Profile

TVS Motor Company (TVS-M) one of the largest two wheeler manufacturers in India, started manufacturing in 1979. TVS-M currently manufactures a range of two wheelers namely motorcycles, scooters, scooterettes and mopeds in its plants located at Hosur (in Tamilnadu) and at Mysore (in Karnataka). Our subsidiary M/s Lakshmi Auto Components Ltd (LAC), the Engine component division has been merged with TVS-M, so the annual report of 2003-04 comprises of both. Our market share is around 22 %. TVS-M is also the market leader in the moped segment enjoying a share of 69 %. The combined capacity as of march 04 is more than 1.6 million vehicles and the annual turn over was Rs. 28,560 million (2003-04). TVS-M also exports its bikes as SKDs and CKDs to African and South American countries and also to Bangladesh and Srilanka.

Our Products

- **Motorcycles**
 - Range : Max100, Max 100R, Fiero, Victor Centra, Star
 - 100 – 150 cc
- **Scooterette**
 - Product: TVS Scooty, PEP
 - 70cc
- **Mopeds**
 - Range :TVS XL, TVS Champ, TVS Sport, TVS XL Super
 - 50-70cc



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Motorcycles



TVS MAX100 (1992)



TVS MAX100 R (1994)



TVS MAX100 DLX (1994)



TVS VICTOR (2001)



TVS FIERO Fx (2003)



TVS CENTRA (2003)

Scooterettes



Scooty (1994)



Scooty PEPY (2003)

Category	Category share in two wheeler industry (2002-03)	Market share of TVS Motor (2002-03)
Motorcycles	74 %	19 %
Scooterettes	7 %	29 %
Scooters	11 %	0 %
Mopeds	7 %	69 %
Business bikes	1 %	0 %
Total	100 %	22 %

Mopeds



TVS XL (1980)



TVS XL super (1997)



TVS XL super HD (1999)



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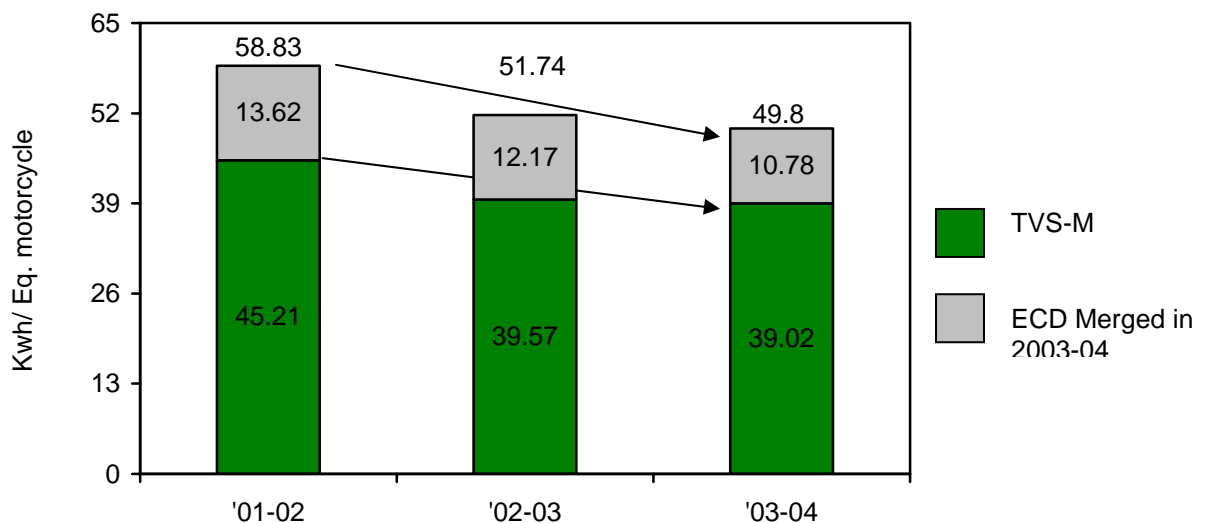


Energy consumption

There is significant decline in the specific energy consumption due to implementation of various energy conservation measures. The energy scenario of TVS Motor company (TVS Motor & M/s LAC on merging) in the past three years is given below. For better clarity the energy consumption of TVS Motor alone (Excluding M/s LAC) is also shown below.

Description	Unit	2001-02	2002-03	2003-04
Annual Production (Equivalent Motorcycles)	Numbers in Lakhs	7.8	10.69	12.60
Total electrical energy consumption / annum	Lakhs KWH	458.9	553.07	627.9
Specific energy consumption : Electrical	KWH / Eq.Motorcycles	58.83	51.74	49.8
Total thermal energy consumption / annum	Million Kcal	29056	34084	33441
Specific energy consumption : Thermal	Million Kcal / Eq. Motorcycle	0.037	0.031	0.027
Total Manufacturing Cost	Rs in Lakhs	9080	12770	19900
Total energy Cost	Rs in Lakhs	1543.7	2085	2934
Energy cost as % of total manufacturing cost	Percentage	17	16.3	14.7

Reduction in electrical energy consumption per equivalent motorcycle in last 3 years

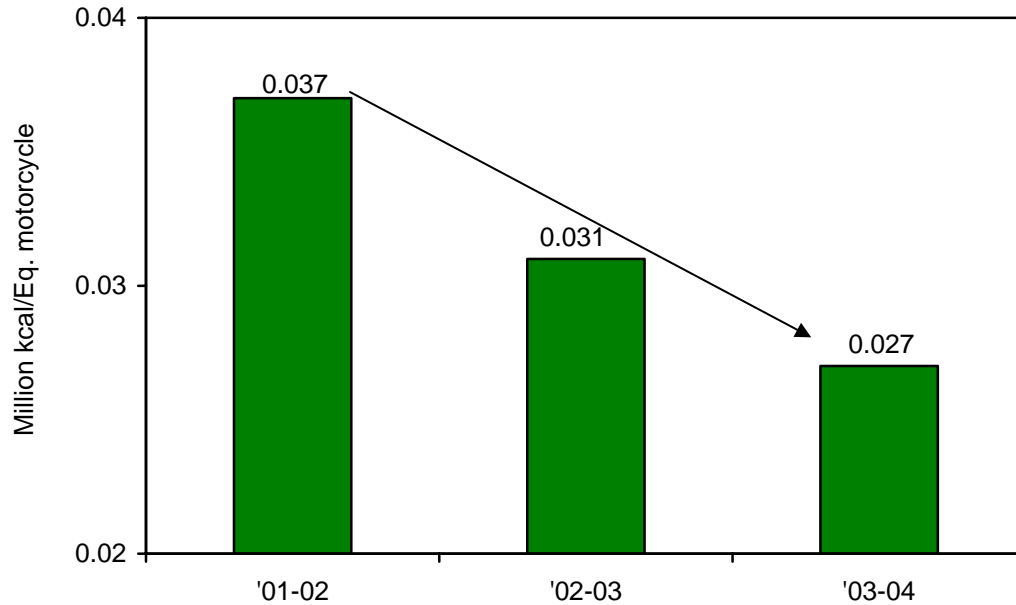




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Reduction in Thermal energy consumption per equivalent motorcycle in last 3 years



Energy conservation commitment

TVS Motor Company firmly believes in the integration of environment, health and safety (EHS) aspects of our work in all our business activities and in ensuring the well being of employees the neighboring communities & society.

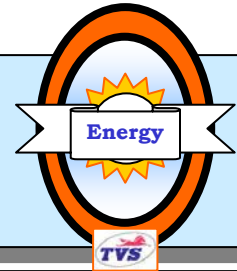
Energy conservation becomes a major part of the actions initiated towards this commitment. Our Energy policy is shown in fig below. Our Energy Policy is shown in fig below. Our EHS Policy also covers the aspect of energy conservation & resource depletion.



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Energy Policy



TVS Motor Company is committed to energy conservation through optimisation of usage & load, continuous auditing & eliminating wastages

We are also committed to energy saving by using alternative methods, efficiency Improvement using non-conventional resources, minimising waste generation & encouraging recycling

We shall comply with the energy legislation and Regulations and build awareness among all Employees for total involvement in energy conservation drive

TVS MOTOR COMPANY





Energy conservation Setup

The setup comprises of 3 levels

Top Level : At this level at the start of the year the policy for the coming year is derived by doing the environmental scan by the top management.

The objectives & Targets are arrived at, following the guidelines of the company policy. The target for energy conservation is fixed.

Top management reviews the plan v/s actual progress at the departmental level w.r.t. the cost of power & fuel incurred

Middle Level: The plan is cascaded to each plant & unit by middle management & brainstorming is done to derive at projects to achieve the targets. The projects are then allocated to SITs or CFTs . These projects are reviewed at unit level at fixed frequency for PDCA.

Necessary training is arranged for executive for new initiatives to enable them to do projects successfully.

Low Level : The targets & projects are communicated through sunrise meetings to working group or the actual doers in this level.

They in turn take up the simple projects individually through suggestion scheme or as a group forming Quality circles.

QCCs conduct their own meetings weekly to review progress. The groups are facilitated by the middle management.

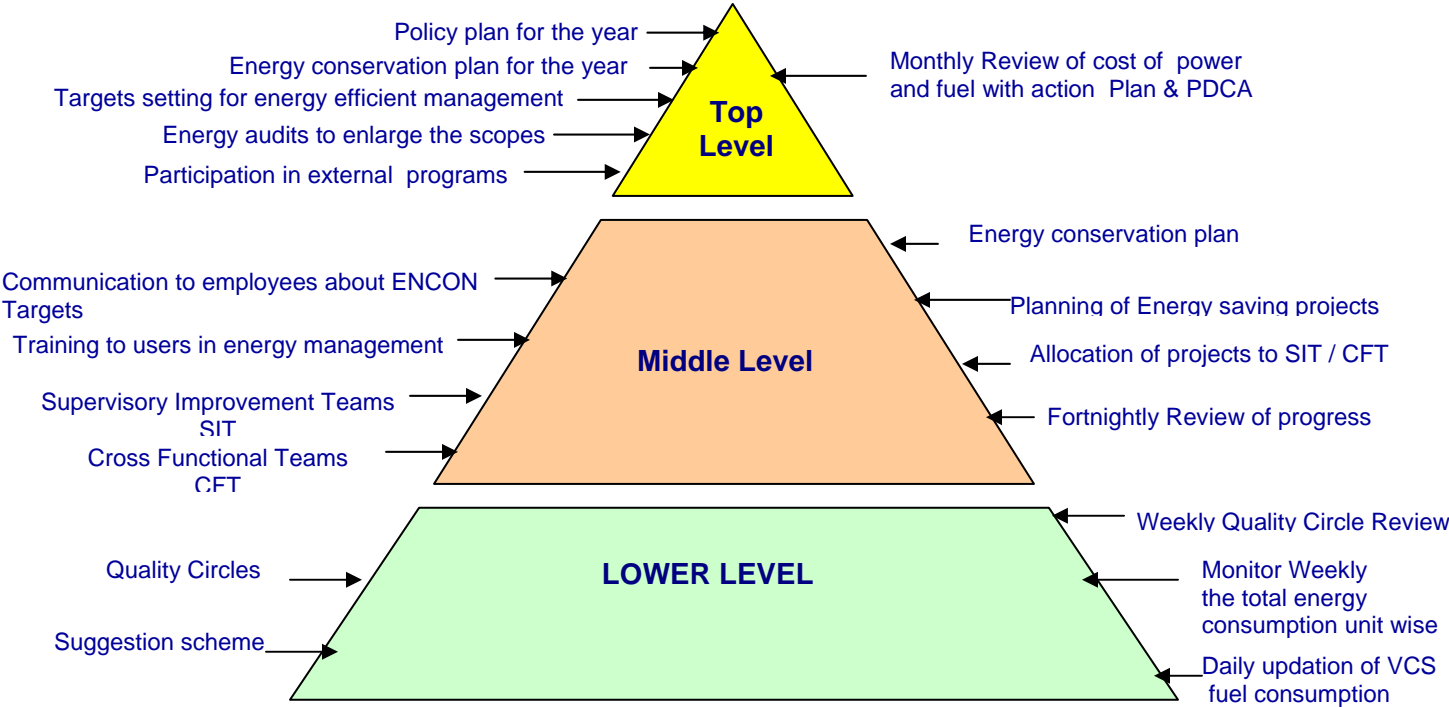
All the three groups work with close coordination & keep in mind the linkage to the final company objective to achieve it.





Energy conservation Set up

System of Energy Management
TVS-M working model





ENVIRONMENT, HEALTH AND SAFETY POLICY

We are a leading manufacturer of personal transportation products and components with manufacturing facilities at Harita, Hosur and Byathapalli, Mysore. We firmly believe in the integration of Environment, Health and Safety (EHS) aspects of our work in all our business activities and in ensuring the well being of employees, the neighbouring communities and society.

WE ARE COMMITTED TO:

- Set and improve the performance standards in all aspects of EHS including compliance with all regulatory standards
- Conserve input resources such as water, energy, oils, paints, packaging materials etc by re-cycling wherever possible and by minimizing pollution loads
- Integrate EHS in decisions such as the selection of technology, materials, services and in procurement
- Ensure that best available EHS practices are used in the design and performance of all our products
- Provide training to our employees for effectively employing sound EHS practices in their work
- Support our suppliers, dealers and contractors in adopting sound EHS practices

Date : 14th November 2001

Signed by: **Venu Srinivasan**
Managing Director



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Energy conservation achievements

From 1994 onwards TVS Motor Company is actively involved in finding out new ways of conserving energy. The company received the "CII-TNEB award for the best energy efficient HT industrial unit in Tamilnadu" for financial year 1999-2000. For 2002-03 we have been awarded with certificate of merit award by BEE, Ministry of Power, Government of India.

During the period 2001 to 2004 implemented 70 projects saving energy worth Rs. 384.8 Lakhs. This was done with the investment of Rs.301.5 Lakhs with pay back period of 10 months.

The major projects implemented during 2003-04 are

1. Unique concept of "Utilizing flue gas waste heat for hot water generation "for process applications in paint plants

Old Method:

The process plant ovens and pre treatment tanks were heated through LDO fired boilers and burners.

Action Taken :

Utilization of DG flue gas exhaust heat for hot water generation through HRU and utilize the hot water at the process plants and stop the LDO fired boilers, which were running for this application. This project implemented in august '03 at hosur the same has been planned for implementation at mysore plant in 04 – 05.

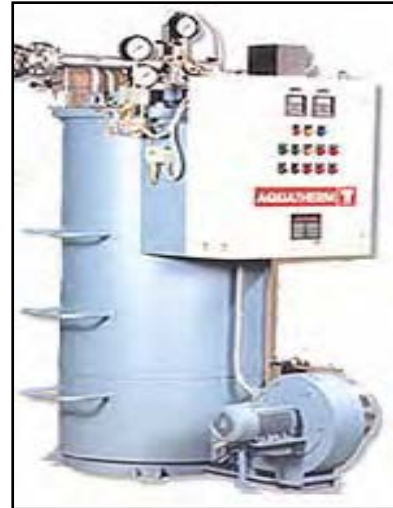
Utilizing the waste heat for generation of hot water directly up to 140⁰ C has been done first time in India. (Generally waste heat is used for steam generation.) This project fuel saving Results are very Encouraging, by end of 2004-05 the expected fuel savings are 1200000 Ltrs of LDO & cost saving are Rs 2.5 Crores.



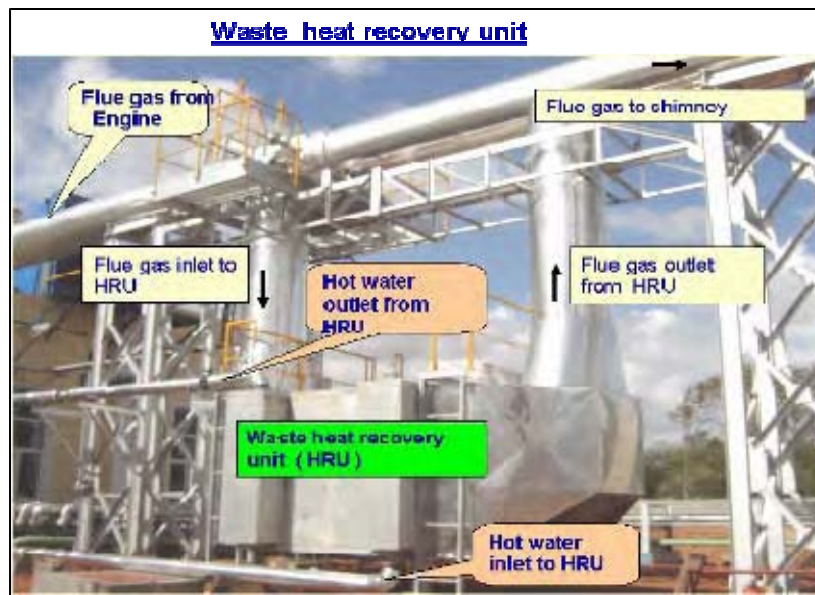
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BEFORE



AFTER



Present Project Cost:: 82 Lacs

Present annual Savings: 120 Lacs

Pay Back: 10 Months.



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2. Utilization of DG cooling hot water for “Chilled water generation through VAM” for air conditioning application

Old Method:

The office areas were cooled by cassette and high wall air conditioners operating in R22 Freon gas

New Method:

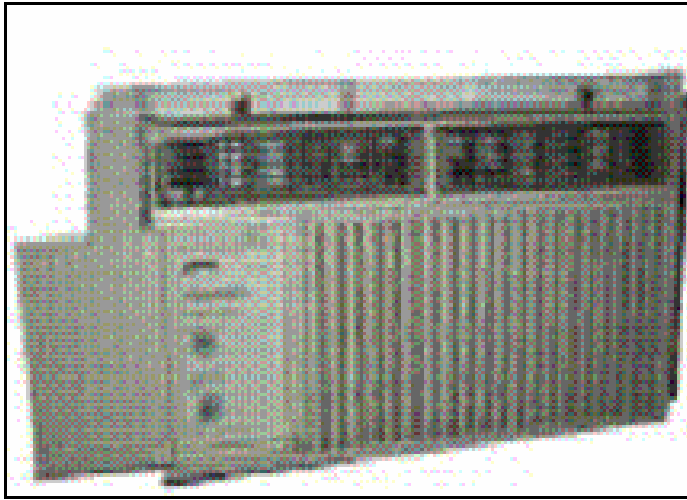
High temperature water or generation of chilled water for air conditioning through Vapour absorption Machine



COMPANY



BEFORE



AFTER

Hot water fired absorption machine



Heat source : DG Jacket Water
Temperature : 80 - 95°C hot water
Flow : 70 MP
A.C capacity - 132 TR



Project Cost: 28 lacs

Annual Savings: 14.4 lacs

Pay Back: 22 months

2. Effective utilization of compressed air with “PLC controlled optimum air system”

Old Method:

All the compressors were running independently with pressure control for loading and unloading. There was no integrated controlling system.

New Method:

Rearrange all the compressors with base and trim compressors. the former meets the base demand of the plant and the later meets the peak demand of the plant. They are integrated through pressure transducer and controlled by PLC.

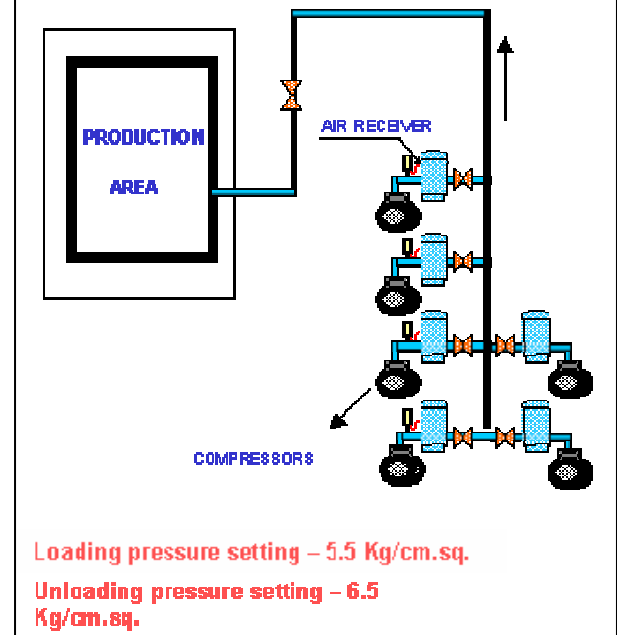
Project Cost: 10.8 lacs

Annual Savings: 8 lacs

Pay Back: 10 months

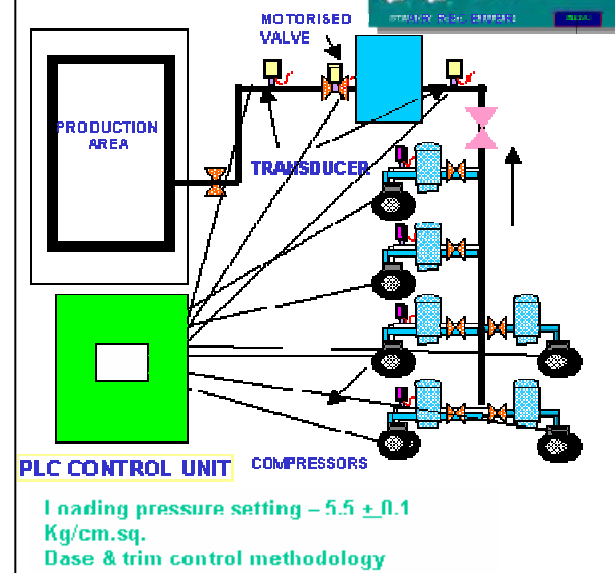
BEFORE

Pressure switch control - Independent



AFTER

Transducer feed back PLC based integrated control





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Major Energy Conservation Future Plans and targets

Apart from exploring the possibilities of horizontal deployment of 112 ideas of energy conservation used in the past, we are also planning some major new energy conservation projects.

Energy Conservation Measures (Planned)	Anticipated savings in Energy		Approx. investment (Rs.lakhs)	Project commencement & completion year
	Value	Rs. In Lakhs		
Install waste Heat Recovery at Central Power Plant (Mysore Plant)	6 lakh litre of FO	125	120	2004-05
Heat recovery from HT water of DG for Hot water driven VAM Air conditioning for process chillers (Mysore Plant)	4 lakh KWH	15	28	2005-06
Recover waste heat from hot water of DGs for process plants at Plant-I	4 lakh litre of LDO	100	95	2004-05
Optimization of compressed air	7.1 lakh KWH	25	10	2004-05
Install waste Heat Recovery at Central Power Plant (Mysore Plant)	4 lakh litre of LDO	80	90	2004-05
Use Waste heat recovery Hot water for fuel heating at Hosur & Mysore CPP's.	18 lakh KWH / annum	65	50	2004-05 & 05-06



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Environment

TVS-M is committed to protection of the environment through adoption of new processes and elimination of hazardous operation.

Adoption of “Clean Technology” is given highest priority in all the manufacturing locations.

Water

- Waste water treatment plants to treat effluent water in all the three plants.
- Installation of evaporator for evaporating high TDS water.
- Implementation of Rainwater harvesting process.
- RO water plants for recycling the wastewater.

Air

- Nine nos of ambient air monitoring stations are installed to monitor ambient air across the company.
- Ventilation arrangement provided for improved fresh air circulation in the production areas.
- Latest technology Jig Decoater has been commissioned to eliminate SPM and VOC emissions.

Solid waste

- Impervious platform with shelter for storing the hazardous waste to prevent water and soil pollution.
- Installation of Heavy metal recovery system.
- Installation of system to eliminate block chrome process, aluminum chromating process and trichloro ethylene.
- The solvent-based paint sludge has been reduced significantly because of the replacement of base coat process with process based on water based paints and CED process.

Green belting

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- Excellent house keeping system is in function
- Tree plantation of over 25000.
- Various types of plants and lawns are developed in and around the factory to improve the environment.



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Safety

Safety management is integrated with the company's overall environment, Health and Safety (EHS) management system and "Achievement of Zero Accidents" is taken up as the company's goal. In this direction, following specific measures are initiated.

- Investigation of "Near Miss" incidents, so that accidents can be foreseen in critical areas and remedial measures are adopted.
- Active involvement of workmen in hazard identification and rectification through joint bodies like Plant Safety Committees, Union Committees. Etc., besides, encouraging safety projects in forums like QCC and Employee suggestion scheme.
- Imparting specific training programs in first aid, fire fighting and job related safety topics on a continuous basis.
- Evolving an "Emergency preparedness plan" to minimise damage due to unforeseen emergencies.
- TPM implementation for achieving zero accidents and prevention of accidents.
- Communication of importance of safety through celebration of safety month in March and highlighting safety importance to all employees in the President's monthly address.
- Top management review of the progress of safety measures on a monthly basis.

All the above initiatives have helped TVS-M to significantly reduce the accident levels.

ISO 14001 and OHSAS 18001

- TVS-M is planning to obtain certification under
 - a. International Standardization Organization (ISO) 14001 and
 - b. Occupational Health and Safety Assessment Series (OHSAS) 18001.

1. Unique concept of “Utilizing flue gas waste heat for hot water generation “for process applications in paint plants

(i) Background

The process plant pre treatment tanks water and booth air were heated through LDO fired boilers and burners. The increasing trend of LDO price is the concern.

(ii) Observation made

The boilers were operating at 120 deg C with hot water circulation through PT tanks. Whereas the PT tanks maximum temperature requirement is only 60 – 65 deg C.

(iii) Technical and financial analysis

By using the CPP Engines flue gas 15 lakh Kcal / Hr heat can be recovered by generating hot water at 130 – 140 deg C at a pressure of 5-6 bar.

The project cost including HRUs, pipelines and instrumentation is Rs. 82 lakhs. The annual saving is Rs. 120 lakhs.

(iv) Impact of implementation

In the first phase we have implemented this in two paint plants boiler application. With this the boilers operation eliminated completely. The LDO saving is 6 lakh litres/annum.

Generating hot water at 130 – 140 deg C at a pressure of 5-6 bar with waste heat recovery has been done first time in India (Generally only steam will be produced). This project is the “ **Trend Setter** “ in reducing our fuel consumption and cost.. As the results are very encouraging, the same is being implemented at Mysore plant also By the end of 2004-05 the expected fuel savings are 1200000 Ltrs of LDO & cost saving are Rs 2.5 Crores.

Action Taken:

Utilization of DG flue gas exhaust heat for hot water generation through HRU and utilize the hot water at the process plants and stop the LDO fired boilers, which were running for this application. This project implemented in august '03 at hosur the same has been planned for implementation at mysore plant in 04 – 05.

Utilizing the waste heat for generation of hot water directly up to 140⁰ C has been done

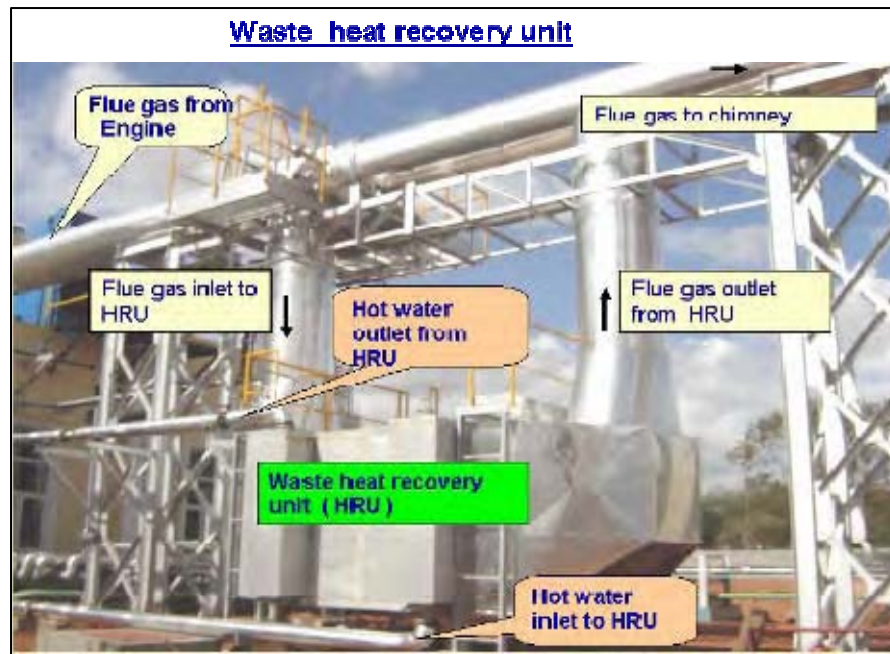
first time in India. (Generally waste heat is used for steam generation.)This project fuel saving Results are very encouraging, by end of 2004-05 the expected fuel savings are 1200000

Ltrs of LDO & cost saving are Rs 2.5 Crores.

BEFORE



AFTER



Present Project Cost:: 82 Lacs
Present annual Savings: 120 Lacs
Pay Back: 10 Months.

2. Utilization of DG cooling hot water for “Chilled water generation through VAM” for air conditioning application

(i) Background

The office areas were cooled by cassette and high wall air conditioners operating in R22 Freon gas. The increasing trend of DG fuel price and power consumption of Supporting areas were the concern.

(ii) Observation made

The jacket water from the DG set was let out at 90-95 deg C to the radiator and the return temperature was 80-85 deg C.

(iii) Technical and financial analysis

By using the CPP Engines' Jacket water 9 lakh Kcal/Hr heat can be recovered to produce chilled water for air conditioning through Vapour absorption machine.

The project cost of VAM is Rs. 28 lakhs. The annual saving is Rs. 14.4 lakhs.

(iv) Impact of implementation

We have implemented this in our Office Blocks . The Electrical Energy saving is 4 lakhs units/ annum

BEFORE



AFTER



Project Cost: 28 lacs

Annual Savings: 14.4 lacs

Pay Back: 22 months

3. Effective utilisation of compressed air with “PLC controlled optimum air system”

(i) Background

The compressors were running independently with their own pressure control without any integration with

(ii) Observation made

The jacket water from the DG set was let out at 90-95 deg C to the radiator and the return temperature was 80-85 deg C.

(iii) Technical and financial analysis

By using the CPP Engines' Jacket water 9 lakh Kcal/Hr heat can be recovered to produce chilled water for air conditioning through Vapour absorption machine.

The project cost of VAM is Rs. 28 lakhs. The annual saving is Rs. 14.4 lakhs.

(iv) Impact of implementation

We have implemented this in our Alpha shop and Reliability Engg Block. The Electrical Energy saving is 4 lakhs units/ annum **Old Method:**

All the compressors were running independently with pressure control for loading and unloading. There was no integrated controlling system.

New Method:

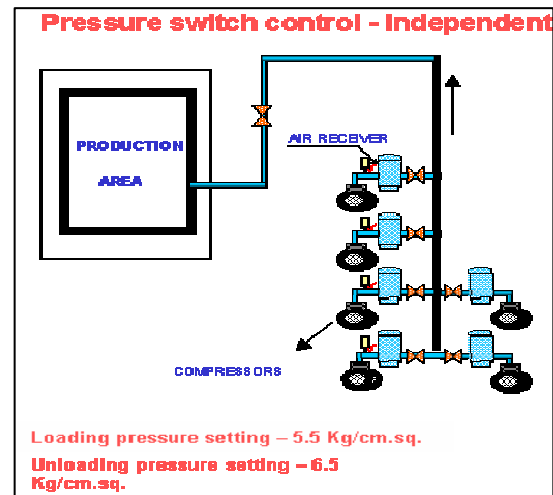
Rearrange all the compressors with base and trim compressors. the former meets the base demand of the plant and the later meets the peak demand of the plant. They are integrated through pressure transducer and controlled by PLC.

Project Cost: 10.8 lacs

Annual Savings: 8 lacs

Pay Back: 10 months

BEFORE



AFTER

