ENERGY CONSERVATION AND MANAGEMENT

"For a greener tomorrow…"

JSW STEEL LIMITED
TARAPUR

The name “JSW Steel” is linked to high quality products, be it Galvanized Steel or Colour Coated Coils. The Tarapur unit, has an annual sales turnover of more than Rs. 1600 crore and is an extremely Quality-conscious unit of this conglomerate. With several six-sigma projects currently on and many more in the pipeline, JSW aspires to continuously raise the benchmark, thereby reducing wastage and conserving the rapidly diminishing resources. Our products meet world-class benchmarks and more than 80% is exported.

Energy Conservation / power saving has been a prime area of focus. As an organization we understand the importance of conservation of natural resources. Our EMS (Environment Management System) policy also lays emphasis on this. Over the last 6 years we have initiated annual projects such as EARN (2001-02), TURNAROUND (2002-03), FOCUS (2003-04), PRAGATI (2004-05) and several SIX SIGMA projects (2005-06, 2006-07, 2007-08) under which we improvised on our own saving over and above the budgeted norms. These projects related to energy saving as well as various aspects of the production process such as scrap reduction. Alongside, as we aspired towards more exacting standards, we formed Quality Circles and launched Improvement Drives. Besides these, several steps have been taken to reduce our energy consumption and they have resulted in substantial savings which are to the tune of Rs. 57.97 Lakh in FY 06-07, Rs. 170 Lakh in FY 05-06 and Rs. 100 Lakh in FY 04-05.

For conservation of energy we are consistently exploring all the possibilities. For example, we found that by simply shutting off one pump permanently at the CRD pump house we can save 6.42 lakh kWh or Rs. 22 lakh per annum! Moreover, we have replaced all the electrically heated vaporizers with latest heatless vaporizers which save us Rs. 90,000 per month. Furthermore, we have automated the switching of cooling tower fans, installed more Variable Frequency Drives for blowers and fans and replaced water cooled compressor with air cooled compressor (in CCL). We have also invested in 2 Lighting Transformers for CCL and Pamarox shed. They

supply steady voltage, at 200V which reduces power consumption and prolongs the life of the lamps too. We have taken many drives onto the System Bus so that they can be controlled by the PLC program, thereby facilitating automatic switch-off and/or speed reduction. Instead of running individual Boilers at process areas for steam production, the WHRB installed in DG Set (Captive Power) compound supplies it centrally. Further, inter alia, planning our shutdown for maintenance in the peak hours so as to avail maximum benefit as per MSEB tariff has also helped to reduce the overall energy consumption. To synchronize all the energy activities we have constituted an Energy Conservation Cell that gives impetus to all the energy conservation related activities.

BRIEF SUMMARY OF STEPS TAKEN TO CONSERVE ENERGY AT JSW

AC motors in Colour Coating Line 1

1. PROJECT: CHANGEOVER FROM DC MOTORS TO AC MOTORS AT GALVANISING LINE III

We will be switching over from energy consuming DC motors to energy efficient AC motors in Galvanizing Line III. The Purchase Order of Rs. 2.1 crore has been released to M/s Siemens for the upgradation. The project shall run from January to March 2008. Installation of AC motors with the latest technology on line will help accrue savings of Rs. 28 lakh/annum and the ROI would be around 6-8 months only.

2. PROJECT: COLOUR COATING LINE II with AC MOTORS and LATEST TECHNOLOGY

A second Colour Coating Line with cutting-edge technology is scheduled to be commissioned in the FY 2008-2009. The prime features of this line are:

- AC motors and drives with common DC bus.
- Specially designed RTO furnace which is 33% better than standard incinerator, with patented technology.
- Advanced automation and technology.
- Power consumption to be 16% lesser than in existing line.

The Purchase Order has already been released to WTIE China in FY 2006-07.

3. REPLACED ALL ELECTRICALLY HEATED VAPORISERS

We have replaced all ELECTRICALLY HEATED vaporisers with HEATLESS VAPORISERS thereby eliminating the need of electricity in the vaporisation process.

- **SAVINGS:** 8 kWh/mT of LPG
- Rs. 90,000 per month or **Rs. 10.8 lakh per year**

4. INSTALLATION OF VARIABLE FREQUENCY DRIVES

Variable frequency drives (VFD's) have been installed for several high-rating motors such as:

- 1 no., 160kW Exhaust Fan in CCL 1
- 2 no., 75kW Compressor motor in CCL 1 and Pamarox shed
- 7 nos, 37kW Recirculation fans in CCL 1

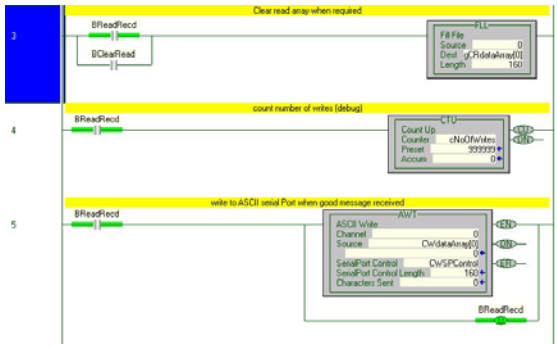
- **SAVINGS: Rs. 10.8 lakhs per year**

5. DRIVES TAKEN ON SYSTEM BUS

We have taken 3 drives (160kW 2 nos and 55kW 1 no.) onto the System Bus in Colour Coating Line 1. This has enabled us to control them easily by automating the switch on-off and/or speed reduction, as per requirement. Several interlocks have been provided as well.

- **EXPENDITURE INCURRED: ZERO** (Upgradation was done in-house)

6. MODIFICATION MADE IN PLC PROGRAMS



Software programs have been further modified to switch off energy intensive loads during breakdown and line-stop, automatically. More motors have come under the purview of this check. For example, in CCL 1, whenever the line is idle for more than 10 minutes, the speed of the 7 RC fans (37kW each) is automatically reduced to 300 rpm.

7. INSTALLATION OF LIGHTING TRANSFORMERS

Installed 2 LIGHTING ENERGY-SAVER TRANSFORMERS with panel for the shed lights as well as street lights in Colour Coating Line and Pamarox shed. They supply steady voltage at reduced levels which reduces the power consumption with almost no perceptible difference in the lighting levels. The life of the lamps is also increased.

- **Investment:** Rs. 75,000 * 2
- **SAVINGS:** 150*2 kWh/day, **Rs. 5.5 lakhs/year**
- **ROI Period:** About 4-5 months

8. REPLACING CRT MONITORS WITH LCD MONITORS

- We replaced 140 old CRT monitors with new energy saving LCD monitors in FY 06-07 and 100 in FY 05-06.
- Further, all the new computer systems are being purchased with LCD monitors only.
- **SAVINGS: 50,000 kWh/year or Rs. 2.0 lakhs in FY 06-07**

9. ENERGY AUDIT CARRIED OUT

A comprehensive energy audit was carried out by M/s Siemens, Mumbai, in August 2007 for:

- Electricity
- Water
- Compressed air
- Steam

The audit also included the efficiency of

- Furnaces
- Pumps
- Cooling towers etc.

Preliminary analysis has suggested that there is scope for 20-22% reduction in energy consumption. Their final report of findings and recommendations is awaited.

10. TRANSLUCENT SHEDS FOR NEW LINES

Translucent sheets have been used in all the new sheds coming up, for natural illumination. These include Pamarox and Colour Coating Line 2 sheds.

11. SHUT OFF WATER PUMP IN CRD PUMP HOUSE

It was decided to shut TM1 and TM3 mills completely as the production was very less and it was not economically viable to continue. In turn, we were able to switch off one water pump in CRD pump house which has led to substantial savings. We have also connected TM3/TM4 through CRD compressor bank thereby eliminating the need to run TM3/TM4's compressors.

- **SAVINGS: Rs. 22 lakhs**

12. VERMICULTURE

Vermiculture is being carried out in the premises. 99mT of organic waste is produced each year from the Canteen and the Mess. It is converted into about 33mT of manure.

- **SAVINGS: Rs. 50,000 per year**

13. RAIN WATER HARVESTING

We are in Phase II of the Rain Water Harvesting Programme. In FY 06-07 more area has been brought under rain-water harvest and this has led to reduction in our water bill by 12-15% during the rainy seaon (4 months in a year).

- **SAVINGS: Rs. 4.8 lakhs per year.**

14. Chimney height increased to reduce load on ID fan.

15. 200 nos. of 2x40W tube light fittings were replaced with 1x36W energy-efficient fluorescent lamps in offices.

16. Maintenance of compressor is carried out regularly based on volumetric efficiency.

17. HPMV lamps were replaced with HPSV lamps of less wattage, wherever possible.

18. Replaced obsolete and inefficient fans and pumps.

19. Prime Mover Optimization in all units.

20. Optimization of speed of fans and blowers as per system requirement.

21. Developing and popularizing other general energy conservation technologies and SIX SIGMA PROJECTS which have demonstrated their maturity and remarkable economic benefits.

22. Extensive training of all personnel in
    - Handling equipment
    - Energy saving methods

23. Training of employees' family members for DOMESTIC ENERGY CONSERVATION.

24. Motivating the workers to save energy through small group and project team activities.

25. Conducting training programs frequently on various issues regarding energy conservation and energy efficient household items, in the plant and in neighboring schools and colleges.

26. Conducting a plant-wide Suggestion Scheme and implementing the feasible suggestions.

THE FOLLOWING TRAINING PROGRAMS AND ACTIVITIES WERE ORGANIZED FOR INCREASING AWARENESS

Name of Activity: **Energy Conservation Awareness Week for Employees**
Duration of Activity: **15 to 21 January 2007**
Reach: **600-700 people**

Description:
Since Maharashtra is reeling under the massive shortfall of energy, JSW thought that it would be a good idea to increase the awareness among the employees and their family members (in February) to help conserve as much energy as possible, within the plant as well as their homes. In this Awareness Week, several activities were carried out:

1. Training Programs
2. Articles on Energy Conservation
3. Placards / Hoardings to increase awareness
4. Quiz Competition
5. Screen savers in computers

Duration of Activity: **5 to 11 February 2007**
Name of Activity: **Efficient Utilization of Energy for Staff Employees**
Reach: **about 150 families**

Description:
In continuation with January's week-long energy conservation awareness activity for the employees, another series of **lectures were held in the various housing colonies** of JSW employees. In JSW, there is no township area as such. However, the company has taken up several houses on lease which it provides to its employees. These houses are clustered in different localities. The energy conservation team went to the following colonies:

RH1 Colony (36 families)
Kurgaon Colony (11 families)
Krishna Nagar (70 families)
Mahavir Nagar (10 families)

Interactive discussions were held with the families residing in these colonies (not necessarily JSW employees) and several simple-to-follow tips were suggested as means to save energy.

Duration of Activity: **19 to 23 March 2007**
Name of Activity: **Programme by External Agency for Energy Efficient Equipments**
Reach: **120 people**

Description:

M/s Santosh Electrical, Navapur Road, Boisar, was invited to speak on the advantages of energy efficient equipment such as CFL's and electronic tube lights etc. They held 3 lectures, one each on 19, 21 and 23 March 2007. Employees from all the departments were encouraged to attend the same. On an average there were about 40 people attending each lecture.

MANAGEMENT INITIATIVES

27. Maintaining an environment of Cooperation, Coordination and Collaboration within the organization

Thus, squabbles are minimised – reduced time needed to manage them. That is, we try not to waste our energy. Instead, we aim to utilise it constructively.

28. Developing an environment of Switched – On people who WILL NOT WASTE TIME.

CONCLUSION

JSW realizes the importance of energy conservation, especially in the wake of increasing energy demands and dwindling resources. Consequently, it sincerely attempts to reduce its energy consumption and does not hesitate to invest in the latest technology which helps towards this end. It has several capital-intensive projects lined up for 08-09 and 09-10. Further, it also believes in developing and sustaining an environment of increased learning and awareness so that each and every employee understands the Energy Scenario and does his bit to conserve energy, not only in the plant but also at home. It is not only important to save energy in the plant, but it is equally important to do so at home. Therefore, JSW focuses equally on shaping the behaviour of its employees so that they consciously do not waste anything, be it time, energy, food, water, clothes, in short anything they possess, lest they find themselves in want of it at the time of need.
