

Raymond Ltd. (Textile Division)Thane Unit (Maharashtra)

Company Profile :

'RAYMOND' a well-recognized and established brand in textile sectors. Raymond is a market leader in the worsted suiting fabric with the market share in excess of 50%.

The plant is located in Thane (Maharashtra) and manufacturing one of the finest qualities of worsted suiting fabric. In the year 2004 - 2005, 7.8 Million Meters fabric was produced and sale turnover was Rs.380 crores.

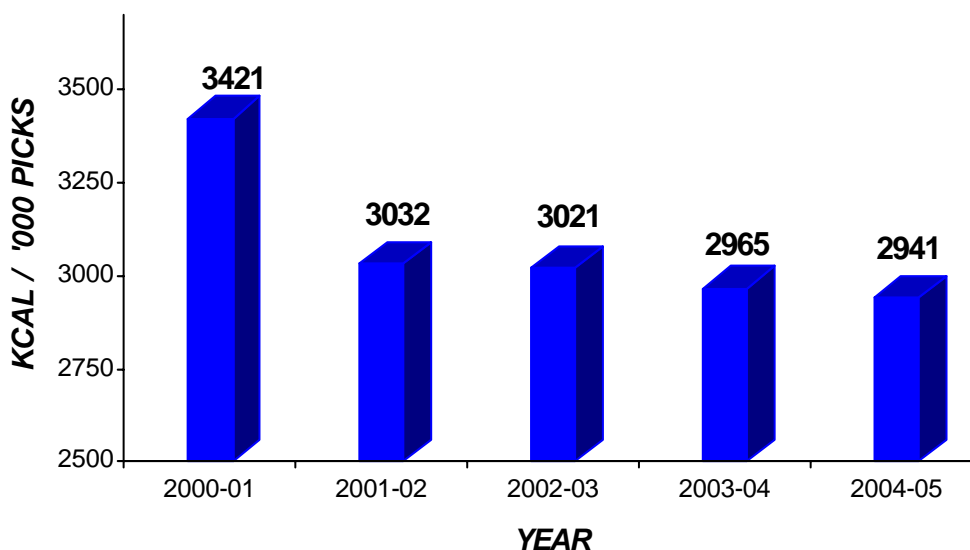
The Unit has adopted the most modern technology and has also given utmost importance for Energy Conservation. Unit has received First Prize on **National Energy Conservation Award for Year 2000, 2001, 2002 and certificate of merit for Year 2003** given by **Ministry of Power, Govt. of India.**

Energy Consumption :

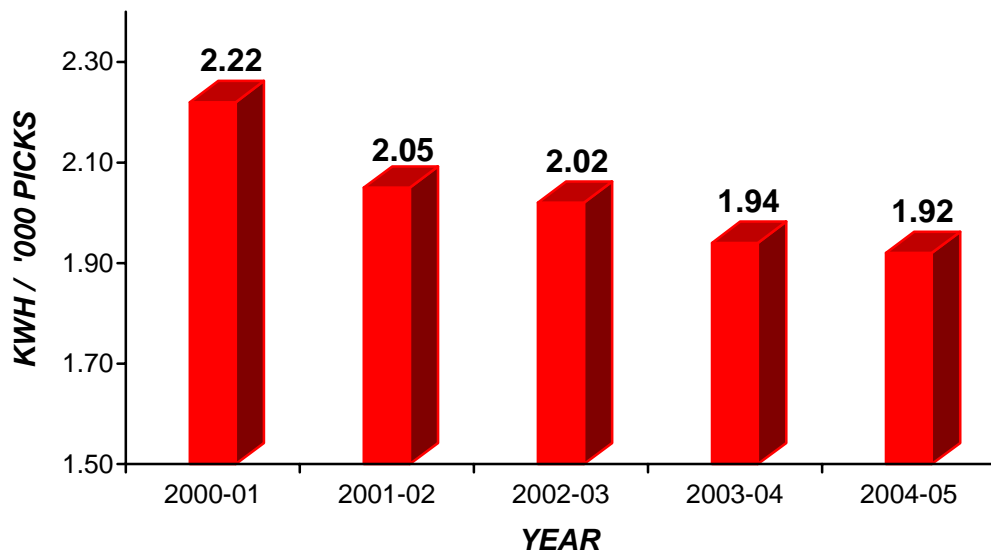
With the implementation of various Energy Conservation measures as an ongoing practice, there is steady decline of specific energy consumption and cost. Last three-year specific energy consumption figures are given below :

| Description | Unit | 2002 - 2003 | 2003-2004 | 2004 - 2005 |
|--------------------------------------|-----------------|-------------|-----------|-------------|
| Electrical Energy | Kwh/1000 picks | 2.02 | 1.94 | 1.92 |
| Thermal Energy | Kcal/1000 picks | 3,021 | 2,965 | 2,942 |
| Total Production Cost | Rs. Lakh | 16,926 | 18,386 | 18,250 |
| Total Energy Cost | Rs. Lakh | 1,844 | 1,975 | 1,950 |
| Energy as % of Total Production Cost | % | 10.8 | 10.7 | 10.6 |

SPECIFIC THERMAL ENERGY CONSUMPTION



SPECIFIC POWER CONSUMPTION



Energy Conservation, Commitment, Policy & Setup:

The Raymond believes energy conservation as a multi disciplinary approach. The unit has given utmost priority for reduction of energy consumption by putting continuous effort towards optimization of operating and process parameters, up-gradation of plant equipment and machinery.

To achieve energy conservation goal, a full fledge energy conservation cell is set up headed by Sr. Manager (Engineering) and comprising the Technical personnel of Engineering Department.

The data on Energy consumption are prepared and reviewed at various levels of management.

- * Daily Energy Consumption reviewed by Sr. Manager (Engg.) and Works Director.
- * Monthly reviewed by President during working board meeting.
- * Yearly reviewed for setting up energy consumption targets for next year.

The Sr. Manager – Engineering , who is heading the energy conservation Cell is given free hand in working for close monitoring and controlling of energy consumption. The Sr. Manager – Engineering is also deciding the strategies to meet the energy conservation target. The other technical members of the cell are helping him in making techno-commercial feasibility study and in implementing accordingly in a scheduled time frame.

A top-level cost control committee is formed to strengthen the Energy Conservation activities.

The Committee members are President (Textiles Division), Works Director, Works Director of each unit, Head of Finance, Account & Costing Departments, key personnel from operation and Engineering Departments.

A monthly cost control meeting is conducted by President (Textiles Division) to review the measures taken to reduce the cost of the company, including Energy Conservation measures.

Small Group Activities :

We have been effectively doing energy saving through the Small Group Activity. Initiatively, we have taken few more measures to improve the effectiveness of Small Group Activity in Energy Conservation.

The measure includes :

- * Rotation of Group Leadership among the members.
- * Forming more groups at production level.
- * Incorporating some more members in groups.
- * Motivating by giving the recognition to group for every suggestion of Energy Saving.

The various energy saving achieved as a results of suggestion from Small Group Activity are :

- a) Stoppage of various Air Conditioning Plants to take advantage of favourable weather condition in winter :

- * Stoppage of Screw Chiller Plant.
- * 15 Hrs. per day for 40 days.
- * Saving of Rs.4.22 Lacs.



- b) Stopping of chilling unit of Contisol Scouring Machine Saving Rs.1.3 Lacs.



- c) Stoppage of Warehouse and Folding Department Air Conditioner Plant for 260 Hrs. Hence Saving is Rs.48,485/-
- d) Stoppage of Doubling and Yarn room humidification unit plant for 68 Hrs. hence saving is Rs.19,000/-.
- e) The above Small Group Activity suggestion and implementation has resulted in Saving of Rs.6,19,000/-.

Major Energy Conservation Projects implemented during the Year 2003-04 :

1) Improvement of Thermic Fluid Heating System :

We have improved the Thermic Fluid Heating System by modifying the existing system.



The salient features of new system is :

- * One new efficient 20 Lacs kCal / Hr. oil heater instead of existing two heaters running at a time.
- * Replacement of pipeline, header with new insulation.
- * New Hytherm mineral oil.

The financial analysis of the project is as follows :

- * Investment includes cost of efficient heater, new pipeline with insulation and new Thermic Fluid oil - 65 Lacs
- * Saving due to :
 - Improvement of heater efficiency - 27.73 Lacs
 - Reduction in radiation loss - 3.06 Lacs
 - Electrical Power of 5.07 kW on account of working single heater - 1.50 Lacs
 - Less make up quantity of Thermic Fluid Oil - 1.20 Lacs
 -
 - Total Saving Per Annum - 33.49 Lacs
 - =====

2) Renovation of Water Softening Plants :

Our daily requirement of Soft Water is 2,400 KL at 8 to 10 ppm hardness. Out of this, the recovery from the process is approximately 800 KL and remaining 1,600 KL is generated through four plants. **The observation made by us is as follows :**

| Plant No. | Capacity | Actual / Present Output | Regenerative Interval | Salt Consumption |
|-----------|----------|-------------------------|-----------------------|------------------|
| 1 | 800 KL | 268 KL | 10 Hrs. | 400 Kgs. |
| 2 | 480 KL | 73 KL | 24 Hrs. | 250 Kgs. |
| 3 | 1,000 KL | 262 KL | 10 Hrs. | 250 Kgs. |
| 4 | 2,400 KL | 1,100 KL | 25 Hrs. | 720 Kgs. |

After analyzing the actual performance data of all four plants, we have decided to renovate the complete Softening process.



The salient features of our new modified system :

- * Operate only the Plant No. 4, with full capacity.
- * Change the resin of Plant No. 4.
- * Change complete bed of Plant No.4.
- * Stop the Plant No. 1, 2 & 3.
- * Increase in regeneration and reduction in backwash time.

The financial analysis of the project is :

| | | | |
|---|--|---|--------------|
| * | Investment for changing resin, nozzle and complete bed | - | Rs.5.2 Lacs |
| * | Saving of Power : | | |
| | Stopping of Softner Plant No. 1, 2, 3 | - | Rs.1.29 Lacs |
| | Reduction in Backwash for Plant No. 1, 2, 3 | - | Rs.1.07 Lacs |
| | Average Reduction in Backwash for Plant No. 4 - | - | Rs.1.89 Lacs |
| | | | ----- |
| | Saving | - | Rs.4.25 Lacs |
| | Saving in Salt consumption | - | Rs.5.61 Lacs |
| | | | ----- |
| | Total Saving | - | Rs.9.86 Lacs |
| | | | ===== |

Impact of Implementation :

- * Huge Saving in Power and Salt.
- * Reduction of work load to plant operator.
- * More consistent and good quality of soft water.



3) Automatic Colour Dispensing Unit for Dyeing Machines :

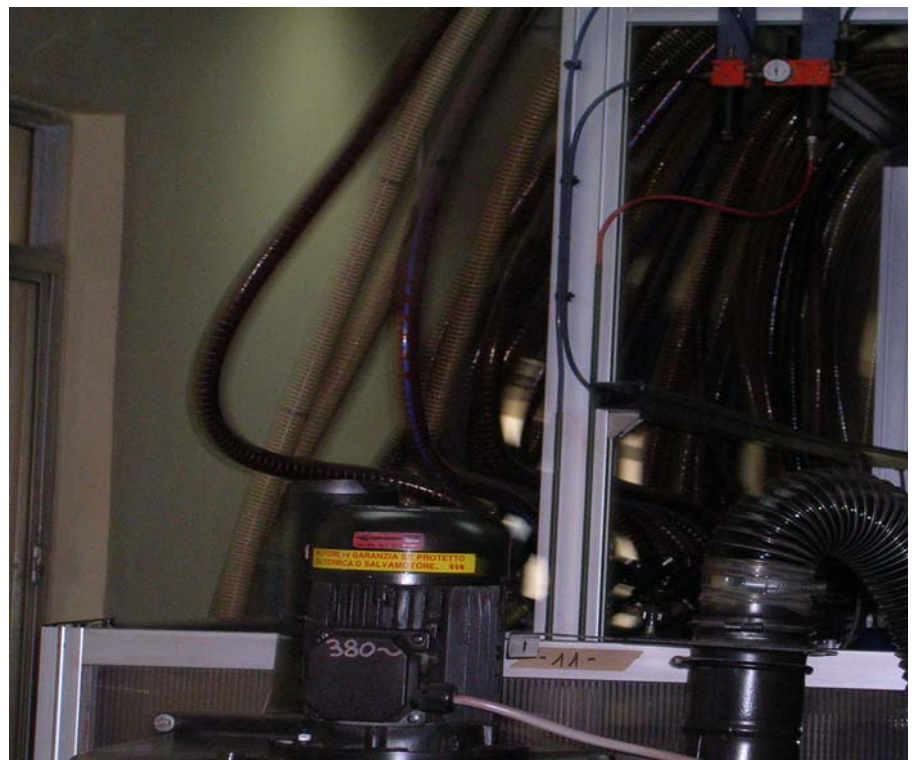


In Dyeing Department, the colour kitchen is one of the key areas, where the different dyes and chemicals are mixed to prepare the required shed of colour. The same is fed into the Dyeing machine.

This was done manually, which increases the chances of error and due to this human error, lots of dyes and chemicals are wasted, as reprocessing is required for shed matching.

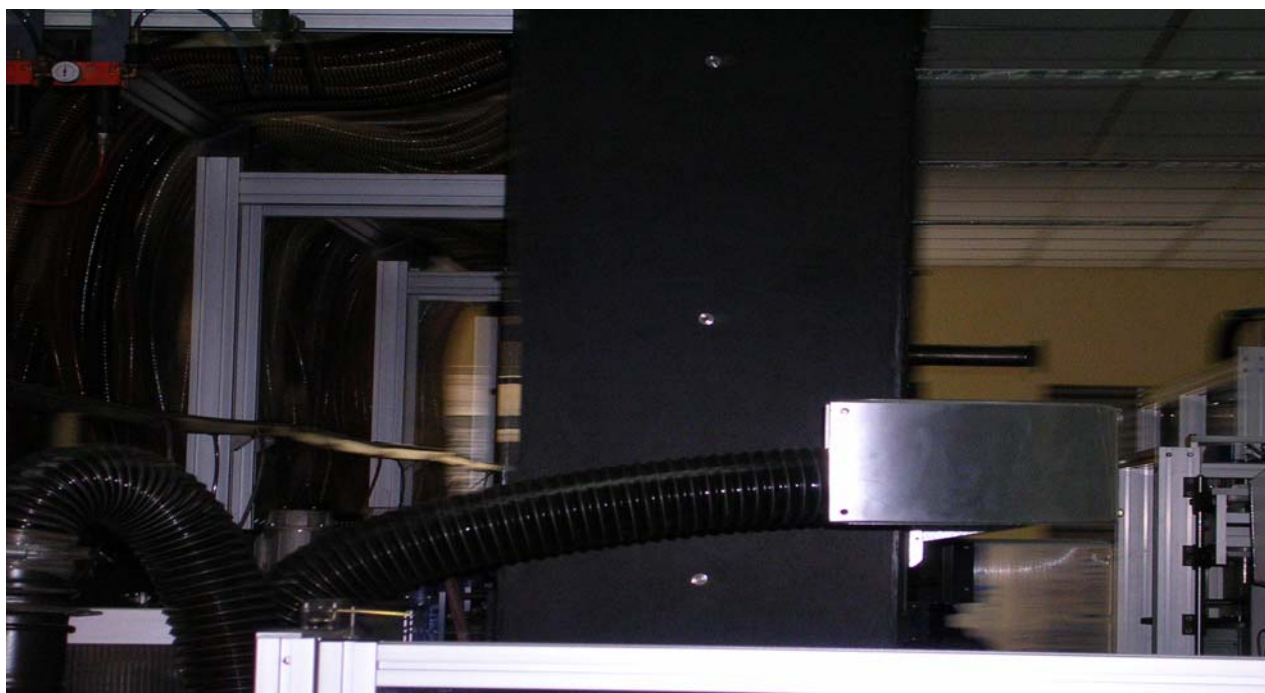
We have decided to go for automatic colour dispensing unit for Dyeing machines.

In this system, the required dyes and chemical in correct proportion is mixed together and sent to machine. Thereby avoiding manual mixing, this reduces the reprocessing considerably and consequent losses in dye and chemicals are reduced.



The financial of this project after implementation is as follows :

| | | |
|---|---|-------------|
| * Investment | - | Rs.900 Lacs |
| * Annual Savings in Dyes / Chemical and Energy (Power / Steam / Water) and Manpower - | | Rs.60 Lacs |



After implementation, this results in consistent quality and exact shade matching of fabric, reducing in work in process.

Other projects implemented during the Year 2004 - 05 :

- 1) Changing of Window Air Conditioning unit by Energy Efficient units.
- 2) Modification of pneumatic system of double duct to single duct on ring frame machine.
- 3) Replacement of slip ring motor by energy efficient motor of Air Conditioning Plants in old Folding and Warehouse.
- 4) Removal of 88 tubelight fittings in Inspection machine by using reflector.
- 5) Installing of timer based OFF / ON switch on Window Air Conditioning units.

Energy Conservation Plans & Targets :

To achieve further reduction in energy consumption following energy conservation projects plans are under active consideration :

- * Modification of TFO motor on 10 machines.
- * Modification of slip ring motor of Air Conditioning Plant.
- * Modification of aerator system to diffused aerator system.
- * Reduce 100 Tube light fittings by installing reflectors.

- * Heat recovery through economiser on Thermax.
- * Modification of Air compressor motor.

RAYMOND LTD. THANE UNIT

**BRIEF DESCRIPTION OF ENERGY CONSERVATION PROJECTS IMPLEMENTED DURING YEAR
2004 – 2005**

We are furnishing details of each Energy Conservation Project in serial as appeared in table.

Sr. 1) No. We had three Thermic Fluid Heater of capacity 15 Lacs kcal each. Two heaters were running simultaneously to supply the hot oil to process and one was standby. The average age was more than 15 years. We had made the following observations :

- * The Thermic Fluid System was running with deteriorated Hytherm Mineral Oil (Flash and fire point is 180 ° C and 190 ° C respectively).
- * Large and redundant pipeline with improper and old insulation.
- * The heaters were operating at efficiency level of 75% to 78%.

As these heaters are running 24 x 7 Days, lots of energy was wasted due to above, also the production was suffering due to inconsistency in getting the required set temperature.

Hence we have decided to improve the system.

The salient features of new system are :

- (b) One new efficient 20 Lacs kCal / Hr. oil heater instead of existing two heaters running at a time.
- (c) Replacement of pipeline, header with new insulation.
- (d) New Hytherm mineral oil.

The financial analysis of the project is as follows :

| | | | |
|-------------------|--|---|------------|
| * | Investment includes cost of efficient heater, new pipeline with insulation and new Thermic Fluid oil | - | 65 Lacs |
| * Saving due to : | | | |
| | Improvement of heater efficiency | - | 27.73 Lacs |
| | Reduction in radiation loss | - | 3.06 Lacs |
| | Electrical Power of 5.07 kW on account of working Single heater | - | 1.50 Lacs |
| | Less make up quantity of Thermic Fluid Oil | - | 1.20 Lacs |
| | | | ----- |
| | Total Saving Per Annum | - | 33.49 Lacs |
| | | | ===== |

After installing the above system, apart from the saving in energy, one more tangential benefit we got is of improvement in quality due to consistency in set temperature.

Sr. 2) No. In our Mill premises, apart from the Air Conditioning Plant, we have many window Air Conditioning units working in individual office area.

We have observed that most of these units of 1.5 TR capacities with more than 20 years of working life, had been consuming more power. Also the annual maintenance cost was higher. Hence we have decided and change 209 units of Window Air Conditioner.

The financial analysis is as follows :

| | | |
|---|---|-------------------------|
| * Average power consumption of old machine | - | 2.2 kW / Hr. |
| * Average power consumption of new machine | - | 1.5 kW / Hr. |
| * Annual Power Saving with 8 Hrs. / Day 350 days for 209 machines | - | Rs.14,33,740/- |
| * Saving in Annual Maintenance Cost | - | Rs. 2,89,883/- |
| Total Saving | - | Rs.17,23,623/- ===== |
| * Investment | - | Rs.30 Lacs |

Impact of Implementation : Better comfort level in offices and less noise, resulted in improved working condition.

Sr. 3) Renovation of Water Softening Plants :

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The observation made by us is as follows :

| Plant No. | Capacity | Actual / Present Output | Regenerative Interval | Salt Consumption |
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- * Change the resin of Plant No. 4.
- * Change complete bed of Plant No.4.
- * Stop the Plant No. 1, 2, 3.
- * Increase in regeneration and reduction in backwash time.

The financial analysis of the project is :

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|--|---|-----------------------|
| * Investment for changing resin, nozzle and complete bed | - | Rs.5.20 Lacs |
| * Saving of Power : | | |
| Stopping of Softner Plant No. 1, 2, 3 | - | Rs.1.29 Lacs |
| Reduction in Backwash for Plant No. 1, 2, 3 | - | Rs.1.07 Lacs |
| Average Reduction in Backwash for Plant No. 4 | - | Rs.1.89 Lacs |
| Saving | - | Rs.4.25 Lacs |
| Saving in Salt consumption | - | Rs.5.61 Lacs |
| Total Saving | - | Rs.9.86 Lacs ===== |

Impact of Implementation :

- * Huge Saving in Power and Salt.
- * Reduction of work load to plant operator.
- * More consistent and good quality of soft water.

Sr. 4) Automatic Colour Dispensing Unit for Dyeing Machines :

No. In Dyeing Department, the colour kitchen is one of the key areas, where the different dyes and chemicals are mixed to prepare the required shed of colour. The same is fed into the Dyeing machine. This was done manually, which increases the chances of error and due to this human error, lots of dyes and chemicals are wasted as reprocessing is required for shed matching.

We have decided to go for automatic colour dispensing unit for Dyeing machines.

In this system, the required dyes and chemical in correct proportion is mixed together and sent to machine. Thereby avoiding manual mixing, this reduces the reprocessing considerably and consequent losses in dye and chemicals are reduced.

The financial of this project after implementation is as follows :

| | | |
|---|---|-------------|
| * Investment | - | Rs.900 Lacs |
| * Annual Savings in Dyes / Chemical and Energy (Power / Steam / Water) and Manpower | - | Rs.60 Lacs |

After implementation, this results in consistent quality and exact shade matching of fabric, reducing in work in process.

Sr. 5) We have modified the existing pneumafil system of double duct to single duct on ring

No. frame machine. The one suction blower is used instead of two blowers.

| | | |
|---|---|---------------|
| * Double duct system (4 HP motor) | - | 2 Nos. |
| * Single duct system (4 HP motor with efficient blower) | - | 1 No. |
| * Savings per machine | - | 2.25 kW / Hr. |
| * Investment for 22 Machines | - | Rs.6.60 Lacs |
| * Annual Saving for 22 Machines | - | Rs.10.39 Lacs |

Sr. 6) We have reduced spindle weight of ring frame machine, thus reducing the power

No. consumption.

| | | |
|--------------|---|--------------|
| * Saving | - | Rs.0.18 Lacs |
| * Investment | - | Rs.0.10 Lacs |

Sr. 7) We have replaced slip ring motor by Super Efficient Motor of Air Conditioning Plant

No. of Old Folding and Warehouse. The slip ring motor was consuming more power also the maintenance cost was also very high.

| | | |
|-------------------------------------|---|--------------|
| * Power Consumption with old motor | - | 40 kW / Day |
| * Power Consumption with new motor | - | 36 kW / Day |
| * Saving in power @ Rs.3.50 per kWh | - | Rs.79,520/- |
| * Investment | - | Rs.1.50 Lacs |

Sr. 8) We have removed 88 tubelights in inspection machines by using reflectors. These

No. are special reflectors, which improve the illumination. Thus we have achieved same illumination with less tubelights.

| | | |
|---|---|-------------|
| * Energy consumption of 88 Nos. of tubelights | - | 76 kW / Day |
| * Annual Saving | - | Rs.93,100/- |
| * Investment | - | Rs.19,000/- |

Sr. 9) Installing timer based OFF / ON switch on 10 Window Air Conditioner of 2 TR. This is basically timer switch where we set ON / OFF time for the air conditioner.

| | | |
|---|---|------------------|
| * Power Consumption before installation | - | 3 Units / Hr. |
| * Power Consumption after installation | - | 2.33 Units / Hr. |
| * Saving per machine | - | 0.67 Units / Hr. |
| * Saving for 12 machines per annum | - | Rs.78,792/- |
| * Investment | - | Rs.26,832/- |

We have observed that the cooling water of the vacuum pump was going into the drain of new scouring range, Hence we have recovered the Cooling Water by modifying the pipeline.

| | | |
|------------------------------------|---|-------------|
| * Water recovered in Ltrs. / Annum | - | 357 Lacs |
| * Saving @ Rs.42/- per 10 KL | - | Rs.1.5 Lacs |
| * Investment | - | Rs.3,000/- |

Sr. 10) We have covered more area under our rain water harvesting programme. The Dyeing shed is covered. The detail of cost saved is as follows.

| | | |
|--|---|-------------|
| * Cost of water collected in the monsoon @ Rs.42/- per 10 KL | - | Rs.25,000/- |
| * Investment | - | Rs.10,000/- |

Sr. 11) Small Group Activity :

No. We have done number of projects under our small group activity initiative; we have taken the advantage of favourable climatic condition in winter and stopped out air conditioning and chilled water plants without affecting the temperature and humidity inside the working area. The various steps taken after monitoring the same are :

- (a) Stopping of chilling unit for continuous solvent scouring machine capacity – 40 TR.
Savings - Rs.1,30,395/-
- (b) We have stopped the Warehouse and Folding Department Air Conditioning plant for 260 Hrs.
Capacity – 60 TR.
Savings - Rs.48,485/-
- (c) We have stopped the doubling and Yarn room humidification unit plant for 68 Hrs.
Savings - Rs.19,000/-
- (d) We have stopped the Screw Chiller Plant of Spinning Air Conditioning. The average daily stoppage of Air Conditioning Plant (Screw Chiller) is 15.7 Hrs. for 40 days.
- | | | |
|---|---|----------------|
| Average Power Consumption per hour | - | 192 kW |
| Power Saving per day | - | 192 x 15.7 |
| | - | 3,014 kW / Day |
| Saving in Rs. for 40 days @ Rs.3.50 / kWh | - | Rs.4.22 Lacs |

For all above energy savings there is no investment, as our plant operators after constant monitoring, have stopped the plants without affecting the temperature and humidity of work area.