



MAHANAND DAIRY
MAHARASHTRA RAJYA SAHAKARI DUDH MAHASANGH MARYADIT,
MUMBAI

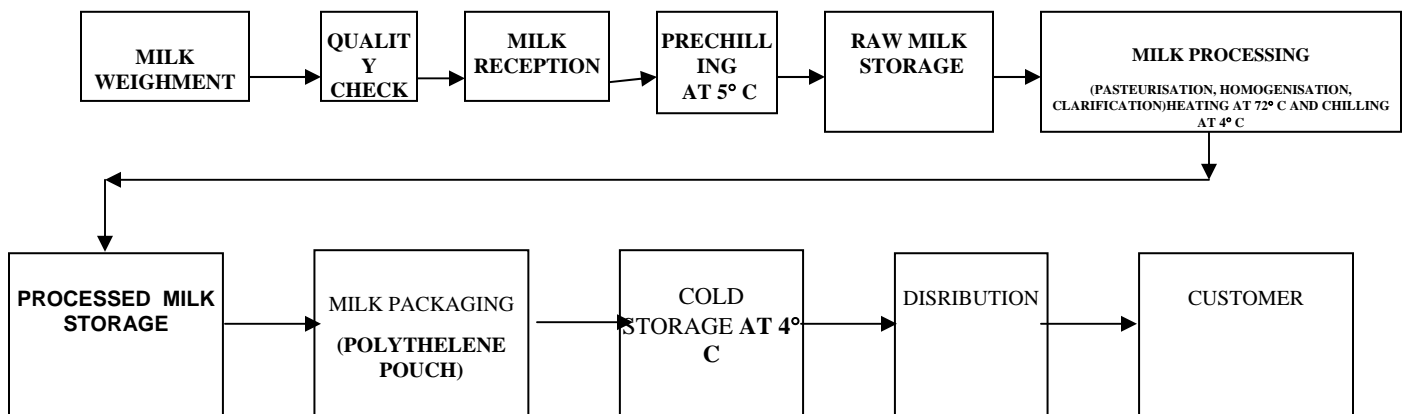
**MAHARASTRA RAJYA SAHAKARI DUDH MAHASANGH MARYADIT,
MAHANAND DAIRY, GOREGAON (EAST), MUMBAI, MAHARASHTRA**

UNIT PROFILE:

Maharashtra Rajya Sahakari Dudh Mahasangh Maryadit (MRSDMM) is an Apex Federation of District / Taluka Milk Unions, established to implement the operation flood programme in the state of Maharashtra. The main objective of MRSDMM is to procure milk from the member milk unions at remuneration rates. MRSDMM is working as a vital link between the milk producers and consumers and working for the economic development and upliftment of the milk producers / farmers in the rural areas. MRSDMM is managing a modern dairy plant popularly known as “MAHANAND DAIRY” at Goregaon, Mumbai. Looking to popularity and growing market demand for “Mahanand Milk”, MRSDMM has started milk distribution activities from Vashi (New Mumbai), Byculla (South Mumbai), Nagpur (Vidarbha – Region), Kudal – Sindhudurg (Konkan Region), Pune (Western Maharashtra), Latur (Marathwada Region), and Nashik (Nashik Region). This will help in achieving uniform development of various parts in the state and equitable distribution of benefits to member milk unions.

“Mahanand Dairy” unit at Goregaon (East), Mumbai has done significant work in the field of “Energy Conservation” since last 15 years and has achieved unbelievable results in this field. As a result of significant results in the field of Energy Conservation, cost – control, productivity and quality improvement, Mahanand Dairy has recurred “National Award” (Eight times) including the award for Best Energy Productivity from National Productivity Council, New Delhi. Accordingly, the Energy Conservation Data, corresponding to milk processing quantities for Mahanand Dairy, Goregaon unit are included / filled up in the “Award Questionnaire”. “Mahanand Dairy” Goregaon unit mainly carries out the activities of processing (pasteurization, clarification and homogenization), packing, cold storage and distribution of cow milk and Toned Milk in Mumbai Market. Some small quantities of milk products such as shrikhand and paneer were also manufactured till 2001 – 2002. From the year 2002 – 2003 onwards some new value added milk products such as Curd, Lassi, Flavoured Milk, Ghee, etc. are added in manufacturing range and quite a sizeable quantities of these products are manufactured and marketed. The “Energy Conservation” measures are mainly taken up for Liquid Milk processing, packaging & cold storage / Refrigeration activities and accordingly data are confined for Liquid Milk (cow milk and Toned milk) processing only.

PRODUCTION PROCESS FLOW DIAGRAM (COW MILK)



ENERGY CONSUMPTION:

Dairy Industry mainly consumes substantial amount of Thermal (Heat) Energy for milk processing (pasteurization, clarification & homogenization), Refrigeration (Electrical) Energy for milk pre – chilling, chilling of milk after pasteurization, cold – storage of packed milk, Compressed Air (Electrical) Energy for pneumatic milk packaging machines. As operations of Dairy units vary from activity, type of milk, type of product – mix, etc. standard authenticated norms are not available for comparison. For example, a Dairy unit carries processing activities without homogenization and clarification shall consume very little energy as compared to the units carries out milk processing activities including homogenization and clarification. Also, units engaged in processing and distribution of liquid milk without packaging (loose milk) and cold storage shall consume less energy as compared to the units carry out processing and distribution of packed milk (pouch milk). Also, Dairy units engaged in reconstitution /processing of toned milk consumes more energy compared to Dairy units not engaged in above activity. Hence, it is very important and essential to have comparison among the identical units only.

Mahanand Dairy is the only unit in the country, processing cow milk with cent-percent homogenization and clarification activities. Also, Dairy distributes the packed milk after storage in cold rooms. Mahanand Dairy, Goregaon, Mumbai has done significant work in the field of “Energy Conservation” and “Water Conservation” and achieved significant savings over a period of last 15 to 20 years, details of which are as under :

- 1) **FURNACE OIL CONSUMPTION** – At our plant due to continuous joint efforts made to save thermal energy, the furnace oil consumption has reduced from 8.9 ml (1984 – 85) to 2.80 ml (2006– 07) per litre of milk processing, resulting into improvement in milk processing from 112 litres to 356 litres per litre of furnace oil. This has resulted into significant monetary savings (Approx. Rs. 80 Lacs per annum).
- 2) **ELECTRICITY CONSUMPTION** – At our plant due to continuous joint efforts made to save electrical energy, the electricity consumption has reduced from 0.036 KWH (1984 – 85) to 0.033 KWH (2006– 07) per litre of milk processing resulting into improvement in milk processing from 27 litres to 30.63 litres per KWH. This has resulted into significant monetary savings (Approx. Rs. 70 lakh per annum).
- 3) **WATER CONSUMPTION** – At our plant due to continuous joint efforts made to save water, the water consumption has reduced from 4.44 liters (1984 – 85) to 1.00 liters (2006– 07) per liter of milk processed. The reduction in water consumption has not only helped in reducing the cost of milk processing but also helped in reducing “Hydrological Load” on Effluent Treatment Plant, thereby reducing the waste water treatment cost. This has resulted into significant monetary savings (Approx. Rs.80 – 90 lakh per annum).

Remarks: MRSDMM feels that these consumption levels are best among the identical dairy industry at National level. However, if some best managed dairy plants are having better consumption levels, same may please be communicated, so as to study and incorporate possible improvement at our plant. MRSDMM feels that still there is huge scope of improvement.

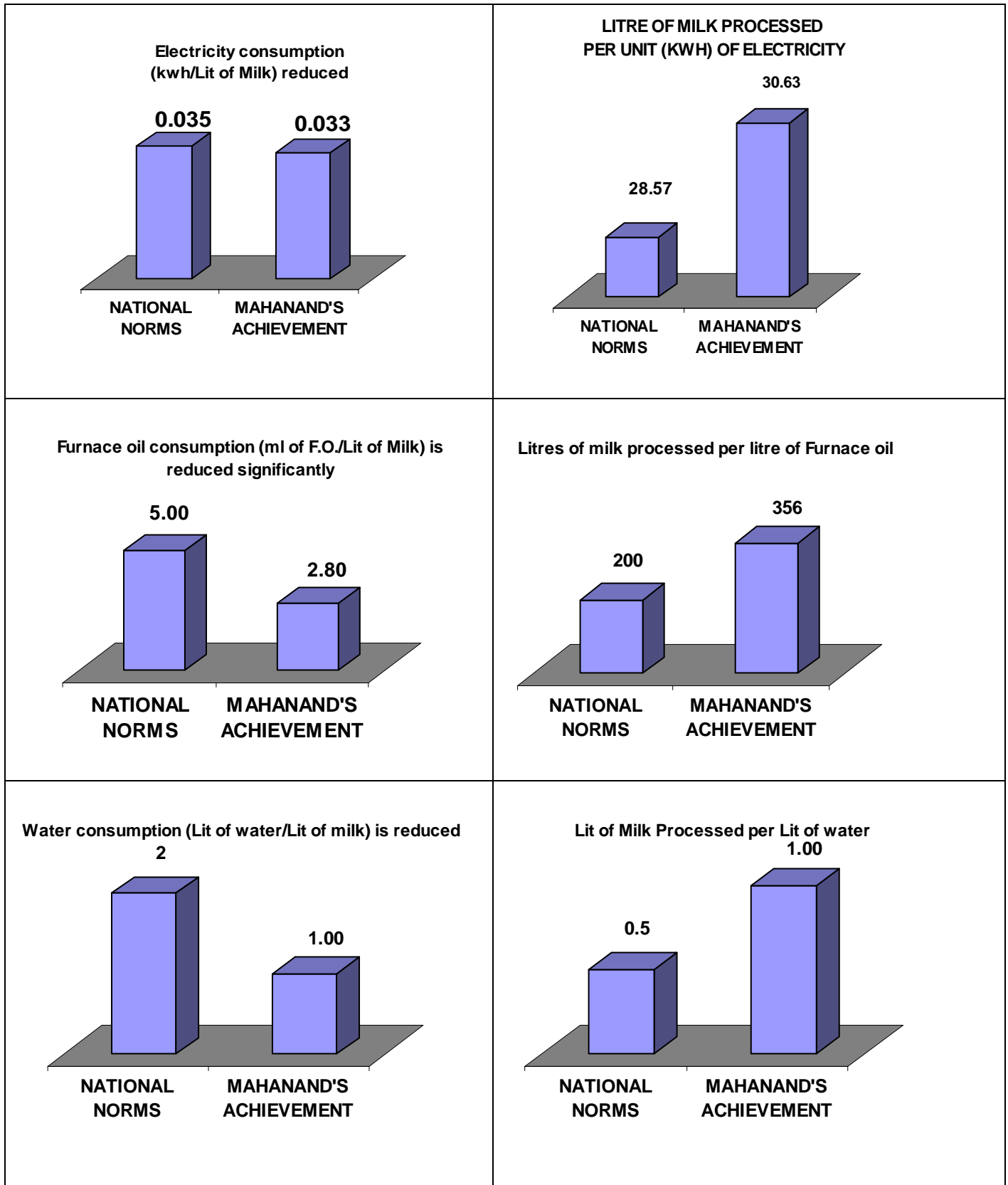
ENERGY-CONSUMPTION-COMPARISON WITH NATIONAL LEVEL NORMS

YEAR	ELECTRICITY CONSUMPTION		FURNACE OIL CONSUMPTION		NATIONAL LEVEL NORMS	
	kWh/Lit	Lit of milk/kWh	ml of F.O./Lit of milk	Lit of milk/lit of F.O.	ELECTRICITY Lit of milk/kWh	FURNACE OIL Lit of milk/lit of F.O.
2004-05	0.029	34	2.51	398	28	200
2005-06	0.030	33.33	2.68	372		
2006-07	0.033	30.63	2.80	356		

Note:

despite of sizeable increase in product manufacturing (Ghee, Shrikhand, Curd, Lassi, UHT flavoured milk etc.) total energy consumption is kept under control and significant improvement is achieved as compared to National Level Available Norms. At Mahanand Dairy, milk processing and packaging operations are energy intensive due to process of homogenization, clarification and packaging/ cold storage operation(milk pouch storage).

GRAPHICAL PRESENTATION OF SPECIFIC ENERGY CONSERVATION COMPARED TO NATIONAL LEVEL NORMS

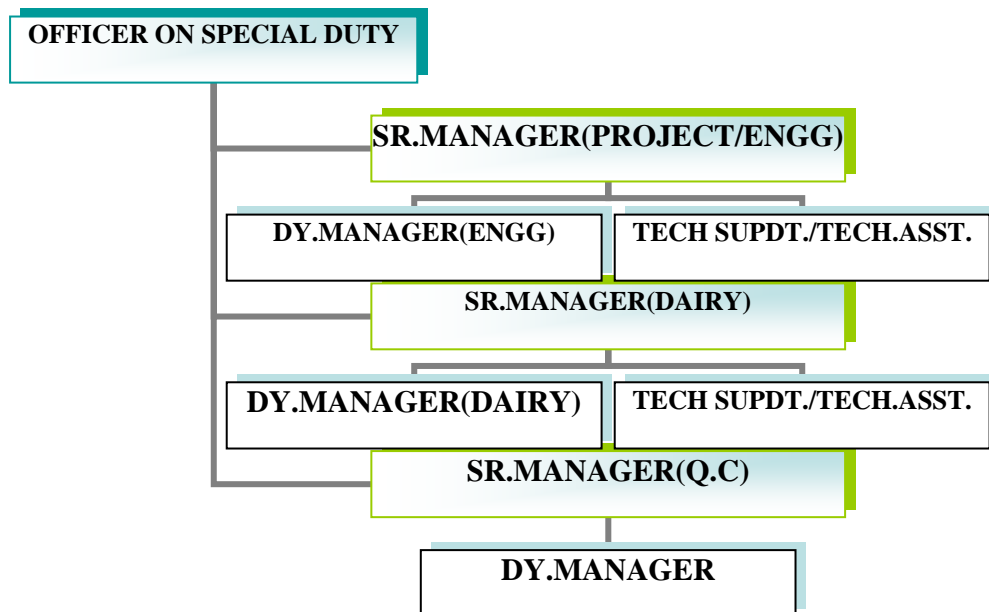


ENERGY CONSERVATION COMMITMENT POLICY AND SET UP –

Mahanand Dairy considers Energy Conservation and Energy savings as very important area for improvement and believes that unbelievable results can be achieved by generating consciousness and awareness about judicious use of energy. Mahanand Dairy also believes in the policy of continual improvement & feels that significant results can only be achieved if proper culture, awareness & consciousness is developed through out the plant. Sometime, it is observed that if proper culture is not there, even by replacement / adoption of highly energy efficient technology may not give desirable results. Energy Conservation plans; policy and consumption data / trend is reviewed periodically, so as to have corrective actions well in time. Appropriate budget provisions are made for plant renovations, up-gradation and R & D projects; adopt advance technology for plant efficiency improvement and energy savings. Looking to potential of further energy conservation, MRSDMM has constituted separate "Energy Conservation Cell", and framed appropriate "Energy Management Policy".

(The "ENERGY MANAGEMENT POLICY" is attached separately.)

ENERGY CONSERVATION CELL STRUCTURE



At present, above personnel are working for the implementation of "energy Conservation programme" in addition to their regular/routine duties and responsibilities.

ENERGY CONSERVATION ACHIEVEMENTS –

Mahanand Dairy has achieved significant achievements in the field of energy conservation by adopting following measures:

- 1) By promoting general energy consciousness & awareness among the staff at grass root level, proper coordination among various energy intensive department, by careful monitoring of process parameters, operational parameters at refrigeration section (ammonia compressors); boiler section (consumption parameter), by adopting periodic cleaning schedule for heat transfer surfaces, etc.
- 2) Replacement of pneumatic milk packaging machines with new mechanical milk packaging machines.
- 3) **Use of non conventional energy – solar water heating system –**
At Latur unit R & D project on **“Solar Pasteuriser”** comprising paraboloid solar concentrator is executed successfully during the year 2005 – 06. By using above system, it made possible to run a milk pasteuriser (5000 LPH) to process milk (20,000 to 25000 litres) without using Boiler / fuel. During initial trials, approx. 65 to 75 litres per day of furnace oil savings are achieved, which is quite encouraging. (Approx. Rs. 4 lac per annum). Approx.50 to 60 tones of CO₂ emission reduction is possible due to above system
Mahanand Dairy using solar water heating system (25000 LPD) since 1990, which was commissioned with the assistance of Department of Non Conventional Energy Sources and Maharashtra Energy Development Agency. The water is heated from 30° C (ambient water temp.) to 85° C with the help of solar water heating system, which is used for boiler as feed water, etc. This has resulted into saving of 200 – 250 liters of furnace oil per day, with monetary savings of approx. Rs. 7 lakh per annum.
- 4) Replacement of old ammonia condenser unit, with new one so as to reduce head pressure (discharge pressure) from 200 – 210 psi to 170 – 180 psi.
- 5) **Use of advanced Anaerobic technology [UASB] for waste water treatment [Effluent Treatment]**
At Mahanand Dairy, very efficient process of effluent treatment based on Anaerobic Treatment followed by Aerobic Treatment is adopted in the year 1996 – 97. The plant is based on UASB [UPFLOW ANAEROBIC SLUDGE BLANKET] technology where BOD reduction of the tune of 18 – 19 % is achieved without power consumption, such plants are very efficient, which gives BOD as low as 7 – 10 BOD (mg/liter), with almost 25 % power consumption as compared to conventional aerobic treatment plant, in addition to above benefits, bio-gas generated is used for electricity generation.
- 6) **Use of Tertiary Treatment for Water Recycling –**
For giving maximum treated waste water for recycling, the tertiary water treatment technology (comprising activated carbon filters, sand filters, water softener, ultraviolet treatment, chlorination arrangement, etc.) was adopted in the year 2002 –03. The capacity of the plant is 300 M³/day, and the water treated is of excellent quality, which is being used for gardening, drainage cleaning, floor cleaning, crate cleaning, etc. The total cost of the project was Rs. 25 lacs & we are able to save approx. Rs. 50 lacs per annum due to above plant.

7) **Electricity Generation From Bio-Gas :**

At Mahanand Dairy, bio-gas generated from the effluent treatment plant is being used to generate electricity by using bio-gas generator (dual fuel) and approx. 500 units of electricity is generated per day, which is being used for running the electrical motors / equipment at effluent treatment plant (ETP). The electricity produced (50 – 60 units per hour) is sufficient to take entire electrical load of ETP. The system is under operational use since 1998 – 99. Approx. Rs. 5 lacs per annum are saved because of above system. The biogas generator helps in monetary savings but also helps in reducing the pollution, thereby helps in maintaining healthy environment. The above system was in regular use till 2001 – 02, but due to some major problems resulted from moisture, sulphur present in the bio-gas, the set is under major repairing.

8) By replacement of old energy inefficient milk pasteurizer unit with energy efficient milk pasteurize plant.

9) By timely arresting of steam leakages, compressed air leakages, hot water leakages, etc. By proper insulation to steam line; heat transfer area, boiler re-insulation, Ghee boiler insulation, etc.

ENERGY CONSERVATION MEASURES AT MAHANAND DAIRY

ADVANCED SOLAR PROJECT:

Solar project for milk pasteurization activity by developing solar water heater, gives hot water at 160°C to 180°C , run a milk pasteuriser at 90°C without using fuel

INSTALLATION: In 2006. The R & D project with technical assistance of I.I.T., Mumbai and financial assistance of M.N.E.S., New Delhi

SAVINGS:

Rs. 4.00 Lacs per annum



SOLAR PROJECT:

Solar Water Heating System to heat 25000 Liters of water per day from 35°C to 85°C . Hot water is used to feed boiler.

INSTALLATION: In 1991 by Maharashtra Energy Development Agency and Ministry Of Non-Conventional Energy Sources, New Delhi.

SAVINGS:

Rs. 7.00 Lacs per annum



EFFLUENT TREATMENT PLANT:

Anaerobic Treatment followed by Aerobic Treatment is adopted in the year 1996 – 97. Gives BOD as low as 7 – 10 BOD (mg/liter), with almost 25 % power consumption as compared to conventional aerobic treatment plant, Bio-gas generated is used for electricity generation.

SAVINGS: The total cost of the project was Rs. 25 lacs & we are able to save approx. Rs. 50 lacs per annum due to above plant.



AMMONIA REFRIGERATION SYSTEM:

Replaced old ammonia condenser unit, with new one so as to reduce head pressure (discharge pressure) from 200 – 210 psi to 170 – 180 psi.

BENEFITS:

Efficient running of Ammonia refrigeration system, reduction of running hours of ammonia compressor.



ENERGY CONSERVATION PLANS AND TARGETS

Mahanand Dairy has planned following Energy Conservation measures / project for future:

- 1) Use of automatic PF controller, use of variable frequency drive, replacement of old energy inefficient motors with advanced energy efficient motors. Approx. investment shall be Rs. 100 – 150 lakh with anticipated savings of Rs. 50 – 60 lakh per annum.
- 2) Eliminating use of compressed air system used for pneumatic milk packaging machines by using advanced mechanical milk packing machines. Anticipated investment shall be approx. Rs. 50 – 60 lakh per annum.
- 3) Use of advanced PHE based refrigeration system for I.B.T.
- 4) Use of waste heat recovery system by installing desuperheater at refrigeration system (discharge line – hot vapour ammonia).

ENVIRONMENT & SAFETY –

Mahanand Dairy is committed to the protection of the environment by prevention of pollution and continual improvement in the Environmental performance by adopting advanced technology. The wastes Treatment Plant, Tertiary Treatment Plant are unique features and even results and performance are appreciated by MPCB officials time to time. The plant can be a “Trend setter” in the Dairy Industry. Also, all the safety measures required are followed and adopted & rate of industrial accidents is almost zero level. The Energy Conservation measures adopted has helped tremendously in reducing the use of energy & fuels, which ultimately beneficial to maintain healthy environment, due to reduced CO₂ emissions / pollutant emissions. Also, at Mahanand Dairy regular tree plantation campaign are taken up, so as to keep healthy environment.

JUSTIFICATION FOR CONSIDERING OUR UNIT (MAHANAND DAIRY) FOR THIS PRESTIGIOUS STATE LEVEL ENERGY CONSERVATION AWARD.

a) ENERGY CONSUMPTION PATTERN IN DAIRY INDUSTRY:

Dairy industry mainly consumes substantial amount of thermal (heat) energy for milk processing (pasteurization), electrical energy (refrigeration requirement for milk prechilling, chilling of milk after pasteurization, cold storage of packed milk, compressed air requirement for milk packaging machines, milk homogenization & clarification operations, etc;)

- ii) As operations of Dairy plant units varies from unit to unit depending upon the type of activity (milk pasteurization with homogenization & clarification & without homogenization & clarification), loose milk disposal or packed milk disposal, type of milk (cow milk with homogenization or without homogenization, buffalaw milk, toned milk (which requires high refrigeration requirements) etc. It becomes extremely difficult to workout specific energy consumption, which is main yardstick for comparison. Because of this complex nature of industry standard authenticated norms are not available for comparison.e.g; at a unit engaged in milk pasteurization activity without homogenization/clarification shall consume very little energy as compared to the units engaged in milk pasteurization activity with homogenization/clarification operations. Also units engaged in processing & distribution of milk without packaging (loose milk) & without cold storage shall consume less energy as compared to units engaged in processing & distribution of milk in pouches. Also dairy units engaged in reconstitution/recombination/processing of toned milk consume more energy compared to dairy units not engaged in above activities. **On account of above complexity & in the absence of bench mark/specific energy consumption, it becomes extremely difficult to**

compare the energy consumption trade in dairy industry. Hence it is very important & essential to have comparison among identical dairy units which are carrying out similar activities.

- iii) **Mahanand Dairy** is the only unit in the country processing cow milk with 100% homogenization & clarification activities; also dairy distributes the packed milk after storage in cold room.
- iv) The main activities processing operations (energy intensive operations) at Mahanand Dairy are as under :
 - a) Liquid milk processing of cow milk with cent percent homogenization and clarification
(4.5 lakh litres per day)
 - b) Tonned milk processing with cent percent homogenization and clarification
(2.0 lakh litres per day)
 - c) Packaging and distribution of milk in pouch and cold storage operations
(4.5 lakh litres per day)
 - d) Total milk processing (pasteurization, homogenization and clarification load)
(6.5 to 7 lakh litres per day)
 - e) Manufacturing of Ghee – 68100 Kg, Curd – 636530 Kg, Lassi – 108260 litres, Shrikhand – 80550 Kg, long life UST milk – 203970 litres, Paneer – 2670 Kg., approx.
- v) Mahanand Dairy is engaged in Energy Conservation activities since last 20 years and believes in the policy of continual improvement. Some of the important Energy Conservation measures adopted by Mahanand Dairy are as under
 - a) By promoting general energy conservation consciousness and awareness among the staff at all levels.
 - b) Proper coordination among various energy intensive departments.
 - c) By careful monitoring of process parameters, operation parameters at Refrigeration Section, (ammonia compressors); boiler section (consumption parameter)
 - d) By adopting periodic cleaning schedule for heat transfer surfaces (Atmospheric condensers, evaporating coils, Boiler – waterside, fire side etc).
 - e) By Power Factor improvement and efficient utilization of pumps, motors and dairy equipments.
 - f) **USE OF NON CONVENTIONAL ENERGY: FOR SOLAR WATER HEATING SYSTEM:** Mahanand Dairy is using solar water heating system (20000 per day) since 1989-90, which was commissioned with the assistance of Department of Non Conventional Energy Sources and Maharashtra Energy Development Agency. The system is well maintained and even working efficiently till date. The system is one of the best-managed and maintained system giving extremely good results since last 6 years (**savings of 200 – 250 litres per day with monitory savings of Rs. 7 lacs per annum.**)
 - g) By replacement of old energy inefficient milk pasteurization unit with new energy efficient milk pasteurization plant, thereby improving heat transfer efficiency and regeneration efficiency.
 - h) Replacement of old ammonia condenser unit, with new one so as to reduce head pressure (discharge pressure) from **200 – 210 psi to 170 – 180 psi.**, thereby improving refrigeration effect with reduced power consumption.

- i) By timely arresting of steam leakages, compressed air leakages, hot water leakages, etc. By proper insulation to steam line; heat transfer area, so as to reduce the heat losses.
- j) Use of advanced Anaerobic technology [UASB] for waste water treatment [Effluent Treatment] Mahanand Dairy has adopted this technology in the year 1996 – 97. The plant consumes negligible energy as 80 – 90 % B.O.D. reduction takes place in the anaerobic digestion. The results are very good (B.O.D. achieved as low as 7 – 10 B.O.D. Mg. per litre). The plant gives the **power saving of 1.5 units per cubic meter of effluent water (approx. savings Rs. 18 lakh per annum).**
- k) Tertiary Water Treatment – Tertiary Water Treatment facilities are used for treatment of 300 cubic meter water per day after waste water treatment for recycling (this has given approx. **savings of 40 lakhs per annum**)
- l) Use of mechanical machines instead of conventional electro pneumatic machines for milk packaging. Mahanand Dairy is in the process of phasing out electro pneumatic machines by mechanical machines in phased manner, so as to eliminate compressed air use, thereby achieving power savings. Already 8 no.s of machines are replaced with mechanical machines. We are in the process of replacing other machines shortly.
- m) **“ADVANCED SOLAR PROJECT FOR MILK PASTEURISATION WITHOUT USING BOILER / FUEL (R & D PROJECT)”**

Looking to the potential of fuel saving for milk pasteurization activity by developing “Solar Water Heater”, a R & D project was undertaken and completed with technical assistance of I.I.T., Mumbai and financial assistance of M.N.E.S., New Delhi, during the year 2005 – 06 at Mahanand Dairy, Latur unit, so as to develop “Solar Water Heating System” suitable for Milk Pasteurisation, without using Boiler / fuel. Accordingly, fully self tracking paraboloid solar concentrator was developed and installed at Latur unit, which gives hot water at 160 to 180°C (Total Heat output 3,80,000 Kcal per day), with heat storage arrangement (50 to 70 % Heat Generated) so as to pasteurize approx. 20,000 to 25,000 litres of milk per day during any time of the day or night. The system comprises paraboloid solar concentrator, (self tracking), pressurized hot water storage tank, heat exchanger, so as to deliver hot water (at 90°C) to milk pasteuriser. By using above system, it made possible to run a milk pasteuriser (5000 LPH) to process milk (20,000 to 25000 litres) without using Boiler / fuel. This will definitely be proved a “Boom” to Dairy Industry in future. During initial trials, approx. 65 to 75 litres per day of furnace oil savings are achieved, which is quite encouraging. (Approx. Rs. 4 lac per annum). In addition to above, the system helps in reducing CO₂ emission in the environment, which is a matter of global concern (Global warming and its harmful effect on the environment)

Approx. 50 to 60 tones of CO₂ emission reduction is possible due to above system. In future, MRSDMM is trying to get the benefits of carbon trading. This will further helps in monetary benefits. The system not only gives significant fuel savings, but also helps in protecting the environment by reducing the CO₂ emission (as per KYOTO protocol, it is mandatory to reduce CO₂ emission in the environment).



**MAHARASHTRA RAJYA SAHAKARI DUDH MAHASANGH MARYADIT
MAHANAND DAIRY, MUMBAI (AN ISO 9001:2000 COMPANY)**

ENERGY MANAGEMENT POLICY

MAHANAND DAIRY is a market leader in the field of processing, marketing and distribution of "COW MILK" in the country.

MAHANAND as a brand name is well recognized and popular amongst consumers because of its excellent quality.

MAHANAND is committed to utilize various forms of energy in a cost effective and efficient manner, so as to conserve energy resources and to make cleaner environment for future generations.


MAHANAND is committed to minimize "**SPECIFIC ENERGY CONSUMPTION**" for milk and milk products to match national / international standards. To accomplish the above, "**MAHANAND DAIRY**" will :

- ❖ Measure, monitor and control the energy consumption by adopting energy conservation measures, so as to minimize specific energy consumption.
- ❖ Carry out annual internal energy audit so as to identify areas of improvement.
- ❖ To adopt advanced modern technologies for the effective implementation of energy conservation programme.
- ❖ To create awareness among all the employees about the energy conservation campaign.

The above will be achieved through dedicated team work, participation, involvement, commitment and technical expertise from employees at all levels.

**(R. A. RAJEEV)
MANAGING DIRECTOR**

Energy Conservation Measures Implemented in 2006-2007

	Title of the measure: Advanced Solar Project for milk pasteurization without using Boiler/Fuel (R & D Project)	Sector: Dairy Sector Technology:
Description of the energy conservation measure:		
<p>Looking to the potential of fuel saving for milk pasteurization activity by developing “Solar Water Heater”, a R & D project was undertaken and completed with technical assistance of I.I.T., Mumbai and financial assistance of M.N.E.S., New Delhi, during the year 2005 – 06 at Mahanand Dairy, Latur unit, so as to develop “Solar Water Heating System” suitable for Milk Pasteurisation, without using Boiler / fuel. Accordingly, fully self tracking paraboloid solar concentrator was developed and installed at Latur unit, which gives hot water at 160 to 180°C (Total Heat output 3,80,000 Kcal per day), with heat storage arrangement (50 to 70 % Heat Generated) so as to pasteurize approx. 20,000 to 25,000 litres of milk per day during any time of the day or night. The system comprises paraboloid solar concentrator, (self tracking), pressurized hot water storage tank, heat exchanger, so as to deliver hot water (at 90°C) to milk pasteuriser. By using above system, it made possible to run a milk pasteuriser (5000 LPH) to process milk (20,000 to 25000 litres) without using Boiler / fuel. This will definitely be proved a “Boom” to Dairy Industry in future. During initial trials, approx. 65 to 75 litres per day of furnace oil savings are achieved, which is quite encouraging. (Approx. Rs. 4 lac per annum). In addition to above, the system helps in reducing CO₂ emission in the environment, which is a matter of global concern (Global warming and its harmful effect on the environment). Approx. 50 to 60 tones of CO₂ emission reduction is possible due to above system. In future, MRSDMM is trying to get the benefits of carbon trading. This will further helps in monetary benefits. The system not only gives significant fuel savings, but also helps in protecting the environment by reducing the CO₂ emission (as per KYOTO protocol, it is mandatory to reduce CO₂ emission in the environment).</p>		
Picture/ sketch/ drawing after modification		
		
Agency that executed the project: Technical assistance of Energy Systems Engineering, Indian Institute of Technology Bombay, Powai, Mumbai-400 076, & Clique Developments Private Limited, Kandivali, Mumbai		
Total Investment, Rs.: 35 lacs		Year of implementation: 2006
First year energy cost savings, Rs.: Approx. Rs. 4 lac per annum		
First year other savings, Rs.: In addition to above, the system helps in reducing CO ₂ emission in the environment, which is a matter of global concern (Global warming and its harmful effect on the environment) Approx. 50 to 60 tones of CO ₂ emission reduction is possible due to above system. In future, MRSDMM is trying to get the benefits of carbon trading. This will further help in monetary benefits.		
On annual basis	kwh 000	Coal (Tones)
Energy Consumption before		Gas Nm ³
Energy Consumption after		Oil (kL)
Energy tariff, Rs/ kwh/ Ton/ Nm ³ / kL..		Other
Company address: Mahanand Dairy, Unit no.12, Aarey colony, W.E.Highway, Goregaon (East), Mumbai – 400 065		We authorize Bureau to use this information for dissemination Signature
Contact person: R.K.Porwal (Sr. Manager-Engg / Project) MRSDMM Western Express Highway, Goregaon (East), Mumbai 400065		Date