

Karnataka Co-Operative Milk Producers' Federation Limited

Unit: Cattle Feed Plant Rayapur, Dharwad-580 009.

BRIEF NOTE

Cattle feed plant Rayapur, Dharwad is the third unit of Karnataka co-operative milk producer federation ltd, Bangalore. National Dairy Development Board, Anand at the cost of Rs 233.78 Lakhs on "turn key basis", erects this plant. Out of Rs 233.78 lakhs, Rs 165.42 lakhs is loan and Rs 68.36 lakhs is subsidy. Loan is to be cleared during the year 2004-2005. The capacity of the plant is 100 M.T./day.

Our plant has got license during the year 1988-89 from Licensing Authority and Joint Director (Development), Department of Animal Husbandry & Veterinary Services Bangalore to manufacture cattle feed. License is being renewed every year.

Our plant is divided into five blocks. They are as follows:

- | | |
|-----------------------------|-------------------------------|
| 1. Raw Material Godown | 2. Production Block |
| 3. Finished Material Godown | 4. Quality Control Laboratory |
| 5. Administrative Block. | |

1) RAW MATERIAL GODOWN;

94.00 % of raw materials used in cattle feed are agro based products and by products. They are not available through the year. We have to store the material, which are available seasonally depending upon plant's capacity. Our plant has got following storage capacity;

- | | | | |
|----------------------------|------------|-----------------------|--------------|
| 1. Raw Material Godown | : 350 M.T. | 2. Silos | : 1,000 M.T. |
| 3. New Raw Material Godown | : 300 M.T | 4. Old Dairy Building | : 400 M.T. |
| 5. Old Dairy Sheds | : 300 M.T. | | |

Apart from these, we have hired two private godowns on area basis i.e at the rate of Rs 2.80/Sq.Feet. The total area hired is 11,000 Sq.ft. We can store 3,270 M.T. of raw material in these godowns.

RAW MATERIAL PURCHASE;

Raw materials used for Cattle Feed production can be classified in to five groups. They are;

- | | |
|----------------------|--|
| 1. Grains | : Maize, Jower, Ragi, Wheat and Bajra. |
| 2. Brans | : Rice polish, De-Oiled Rice Bran, Wheat Bran and Gram Bran. |
| 3. De-Oiled Cakes | : Ground Nut, Cotton Seed, Soya Seen, Rape Seed, Sunflower Coconut, Ambadi and Karadi D.O.C's. |
| 4. Pre-mix Materials | : Salt, Mineral Mixer, Calcite and Urea. |
| 5. Molasses | : By product of sugar factory. It contains 50-55 % sugar. |

All raw materials except molasses, urea and mineral mixture are being purchased by our central office. Till October 2000, raw materials were purchased through **Dynamic Purchase System**. From **4th October 2000** onwards raw materials are being purchased through **Tender System** as Government of Karnataka promulgated **ordinance Transerency in Public Procurement-2000**.

'A' Grade molasses is purchased from Government & Co-operative sugar factories by participating in tenders. Urea is being purchased from Karnataka Co-operative marketing federation, Hubli branch. Mineral mixture is being from cattle feed plant, Gubbi, which is our sister concern. We have got license from Excise Department of purchase & use molasses in cattle feed. During the year 2000-2001, we got increased our molasses permit quantity from 3,000 to 3,600 M.T. /Year. Molasses storage capacity is 850 M.T.

2. PROCESSING BLOCK;

Different stages of Cattle Feed production are as follows;

Raw materials Intake → Grinding → Batching → Batch mixing → Molasses mixing
→ Pelleting → Bagging

We are manufacturing three type of Cattle Feed. (During the year 2004-05)

1. Nandini Cattle Feed Type-I	-----	12,930.350 M.T.
2. Nandini Cattle Feed Type-II	-----	9,172.150 M.T.
3. Nandini Bypass Protein Feed	-----	9,389.900 M.T.

Cattle Feeds is produced as per the quality specifications fixed by Licensing Authority. Feed batches are taken by microprocessor system. To have perfectness in weighing we have installed electronic bagging & weighing at the cost of Rs 2.25 Lakhs during January 2002. We have installed new Auto Batching System programmable logic control (PLC) at the cost of Rs 6,23,209.00.

Capacity utilization of the plant during the year 2004-05 is 94.96%.

3. FINISHED FEED GODOWN:

Finished feed is being packed in 50Kg H.D.P.E bags and they are stored in Finished Material Godown. The capacity of the godown is 350 M.Ts. After getting clearance from quality controls section feed will be dispatched. For easy identification of type of feed, Nandini Type- II feed is being packed in white colored bags, Type-I feed in Green colored bags and Bypass protein feed in Yellow colored bags. All type of bags are printed with requisite information as per Licensing Authority.

4. QUALITY CONTROL LABORATORY:

Unit has fully equipped laboratory has got equipments glass wares, Chemicals and others worth Rs. 6,11,090.34. Quality control Division has got qualified trained and experienced staff.

In laboratory, raw materials, finished feed and packing materials are being analysed. Quality control Division has got computer. Least cost formulae are being obtained by using Linear Program-88 software, conforming to quality specifications fixed by Licensing Authority.

5. ADMINISTRATIVE SECTION:

From administrative point unit has got following six sections.

1) Administrative Section 2) Production Section 3) Stores Section 4) Quality Control Section 5) Finance Section 6) Purchase Section.

Since we sell feed mainly to our milk unions, we do not have separate sales section. The sales activities are being looked after by stores section.

In order to increase efficiency, productivity, quality consciousness and skill, employees were sent to N.D.D.B Anand/Mehasana, C.T.I Bangalore, ApTech – Dharwad and U.A.S Bangalore for Training in

varied subjects like plant management , Electrical systems, Computer Awareness programme, First Aid, Fire Extinguishers Handling, Boiler Maintenance, Raw material and Feed analysis etc.

In order to computerize of the unit, 05 computers are purchased and given to each section. Unit has got 31 permanent employees and 23 contract employees (who have come from contractor) Bagging, Dumping, Stocking, Unloading, Pre-Mix, Gardening, Security and canteen work is given on annual contract.

6. OTHER FACILITIES OF THE UNIT:

Unit has got 300KVA electric sub station. There are two baby boilers having capacity of generating 400Kg steam/hour each. Boiler are fed by furnace oil. Unit has got 21,000 liter capacity furnace oil tank. Unit has got enough space for packing loading vehicles. Unit is located near Navalur railway station, which help us to procure raw materials through railway in bulk from Northern and Western India. Unit is not only located near railway station but also located on National High Way No.4. This helps the raw materials vehicles to come and go easily, in turn it reduces transportation cost.

TURNOVER:

During 2004-05 unit has made Rs 19.58 crores turnover with profit of 80.00 lakhs. since eight years unit is running under profit.

I.S.O 9001-2000 CERTIFICATION

In order to provide good service, apart from giving good quality cattle feed to milk producers, and in order to bring good systems in cattle feed units and to make continuous improvement, our Central office has decided to have I.S.O-9001-2000 Certification to all cattle feed plants.

Poka Yoke, Quality Management Services, Pandichery was appointed as consultant. Preliminary preparations were started from 14th January 2003. After completion of modalities Indian Register Quality Systems, Mumbai, Bangalore branch was invited for certification. After verifying records and systems adopted Indian Register Quality Systems, Bangalore branch issued I.S.O. 9001-2000 Certificate No:IRQS/041193.

QUALITY POLICY

We at Karnataka milk producers' Co-Operative Federation Ltd, are committed to meet the requirements of our valued customers through manufacture and supply of cattle feed and allied products adopting scientific methods and linear programmed formulations.

While complying with the requirements, legal and others, we strive to continually improve our performance, there by enhancing satisfactions of our customers.

QUALITY OBJECTIVES

1. Reduction in absenteeism level by 10% over the 2002-03 level.
2. Reduction in expenditure on account of over time 25% over the existing level.
3. Reduction in energy consumption per MT of finished product by 5% over the average of 2002-03.

4. Identification of all training need will be completed by December of each year.
5. Reduction in non conformance in supplies made to customers by 30% over the previous monthly average.
6. To reduce MTBF by 10% over the 2002-03 level.
7. All trucks arriving up to 16.30 hrs to collect normal demand will be loaded and released on the same day.
8. Attempts will be made to meet abnormal demand of a customer within 3 working days.

In total our unit is giving good services to milk producers for which it is establishment

(i) Unit Profile:

Surat District Co-operative Milk Producer's Union Ltd, abbreviated as "**SUMUL**" situated in Surat City and it is very near to Surat Railway station. Surat is very well known for Textile and Diamond business but at the same time it is also well known for Co-operative organizations which are originated first in India. This organization is established with clear and broad objectives and registered under Bombay State co-operative society act VII vide registration NO.PD/688 OF 22nd August 1951. When Sumul came into existence, middleman were exploiting both milk producers as well as consumers. Sumul started this business with following objectives.

- (1) To provide year round milk market for their surplus milk and to earn reasonable returns for the milk to improve their quality of life.
- (2) To procure milk and process it into good quality milk and milk products to market it at most economically and efficiently to give maximum overall net returns to the producers and general satisfaction to the consumers.
- (3) To provide essential technical inputs and services to the producers at their door steps in an economic and efficient manner and also in a way most acceptable to them to increase milk production and to reduce the cost of production.

Sumul is in business of procuring the milk, processing the milk, manufacturing milk products and distribution of milk and milk products in Surat district under brand name "Sumul ". Sumul is a member union of Gujarat Co-operative Milk Marketing Federation Ltd. Anand and manufactures milk products under brand name Amul for Gujarat Co-operative milk marketing Federation LTD, Anand. Sumul is also ISO –9002, HACCP and ISO –14001 Certified organization. We are certified from Export council of India, which will help in improvement and export of surplus milk and milk product.

Sumul procures milk through well-established procurement network having 1006 village milk co-operative societies in connection of 2,17,615 producer members. The major milk collection is done from poor and marginal tribal farmers who are totally dependent on dairy husbandry and among them Sumul has establish its name as "Kamdhenu". Sumul is not only procuring milk but it has taken the responsibility of improving the quality of life of tribal people by providing remunerative prices to their milk through out the year. Provide input and veterinary services at subsidized rate and extension services and by implementing rural

sanitation programs. It organizes so many developmental programs along with Government, Non Government, UNICEF, G.C.M.M.F. Ltd, and N.D.D.B. at village for the development of rural life through a co-operative net work. Sumul's main business is to meet the demand of liquid milk of Surat City first. It has 1850 dedicated distribution Agents appointed by Sumul to sale only Sumul milk. Milk is sold through appointed authorized Agents only while milk products are distribution through distributors appointed by Sumul. Sumul has 69 % market share in liquid milk over all and 90 % market share in packed milk.

Name of Product	Pouches
Pasteurized standardized Milk	500 ML , 6 Litres
Sumulya High Fat Milk	500 ML , 6 Litres
Delite Homogenised Toned Milk	250 ML, 500 ML
Skimmed Milk	6 Litres
Butter Milk	500 ML
Butter	cartons
Ghee	Tin, Pouches
Paneer	Pouches. Tin
Flavored milk	Bottle,
Curd	Cups (200 & 400 gm)
Gable Top	Paper box
Sweets	

The basic requirement of customer of milk is it should be available in time in the market as per convenience of the consumers. Sumul deliver milk in market four times in a day to meet the requirement of each type of customer. Milk should not be curdled when consumer's use it is the prime requirement and it should meet the standards also. Sumul is also manufacturing and marketing indigenous products like shrikhand,

Sweets, penda, paneer, Ghari, Flavoured milk, Ghee, Masala chhas, Yoghurt (Masti Dahi) ,GableTop. Sumul products are well accepted by the consumers. Sumul is also manufacturing milk powder, table butter and ghee under " Amul Brand" and marketed through GCCMF limited.

Sumul is well structured as far as employees base is concern total 892 no of employees for managing various activities of Sumul has highly qualified staff on its role.

Organization Employee Strength Details

Post	No	Post	No
Managing Director	001	SR./JR. Executives	098
Asst. General Manager	006	SR. /JR. Assistant/Tech Grade-1	163
Manager	007	Technician Grade II	036
Deputy Manager	006	Work man Grade- 1	071
Assistant Manager	020	Work man Grade- 2	272
SR. Exe. / Executive officer	070	Work man Grade- 3	112
Total			862

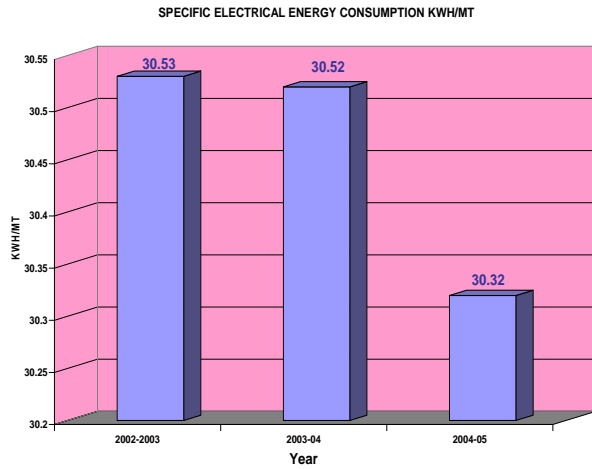
(ii) Energy Consumption:

There is a steady decline of specific energy conservation due to implementation of various energy conservation measures in last 3 years. The details are as given below :

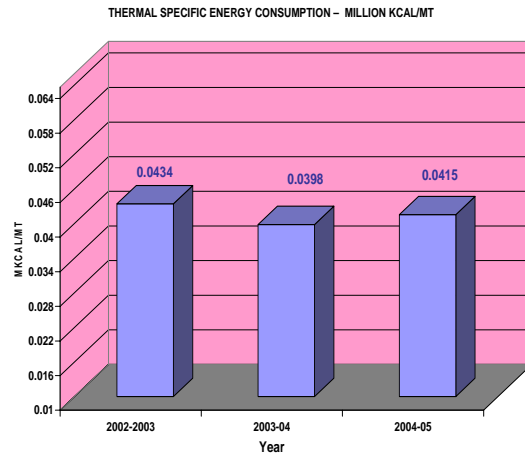
DESCRIPTION	UNIT	2002-2003	2003-04	2004-05
ANNUAL MILK & MILK PRODUCTION	MT	254677.53	266668.08	291492.5
TOTAL ELECTRICITY CONSUMPTION/ ANNUM	LAKHS KWH	77.77	81.40	88.405
SPECIFIC ENERGY CONSUMPTION	KWH/MT	30.53	30.52	30.32
TOTAL THERMAL ENERGY CONSUMPTION / ANNUM	MILLION KCAL	11062.72	10637.51	12099.9
SPECIFIC ENERGY CONSUMPTION – THERMAL	MILLION KCAL/MT	0.0434	0.0398	0.0415
TOTAL MANUFACTURING COST	LAKHS RS.	2358.59	2832.51	3225.29
TOTAL ENERGY COST	LAKHS RS.	572.12	584.48	635.25
ENERGY COST AS % OF TOTAL MANUFACTURING COST	%	24.26	20.63	19.6

REDUCTION IN SPECIFIC ENERGY CONSUMPTION COMPARED WITH 2004-05

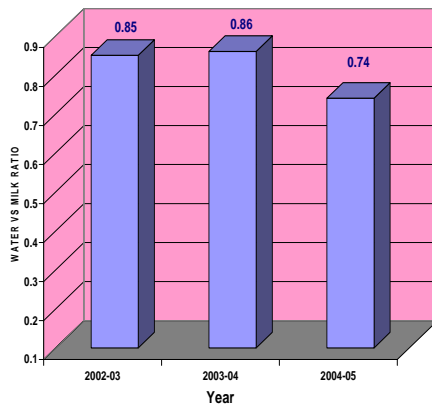
ELECTRICAL



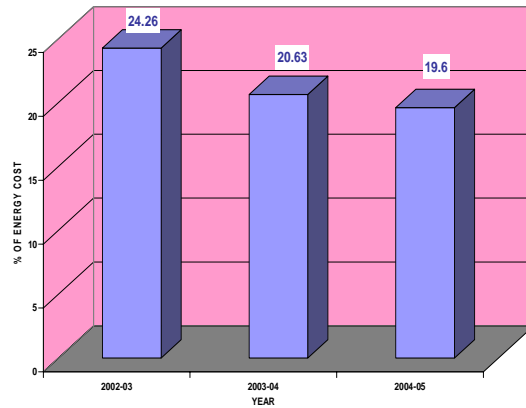
THERMAL



Water Vs. Milk Ratio



% of Energy cost to manufacturing



(iii) Energy Conservation Policy & Setup:

Energy Policy:-

We are committed to conserve the energy which is a scarce resource with the requisite consistency in the efficiency, effectiveness in the cost involved in the operation and ensuring that production quality & quantity, environment, Safety, health of people are maintained.

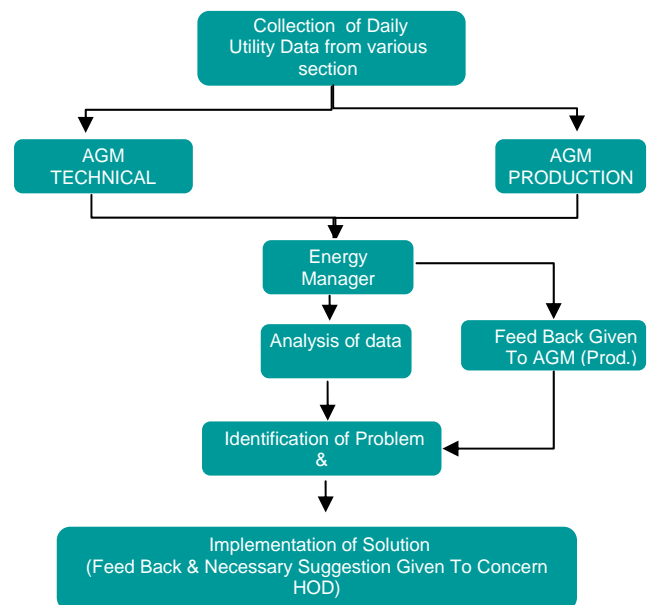
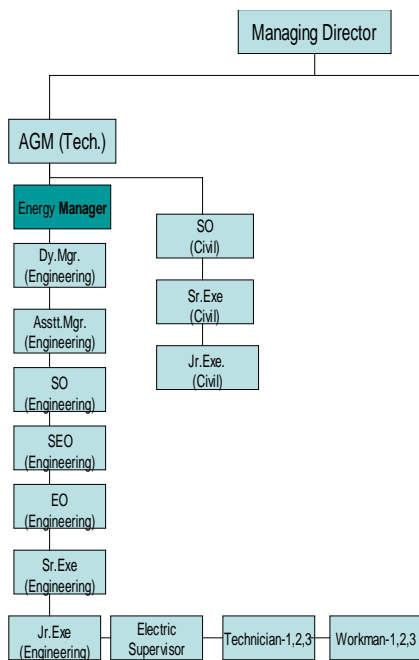
Our Mission is

To be lowest specific energy consumer in the industry we operate.

This we plan to achieve by the following:-

- Manage efficiently the utilization of energy resources upgrade hardware & employ Cleaner & efficient Technology.
- Carryout regular internal & external audits to identify area for improvement.
- Bench-mark continuously our performance against best practices.
- Enrich our experience on energy conservation by exchange of ideas with other organization.
- Promote awareness among all members of the Sumul large family.

Energy Management Setup & Communication channel:



(iv) ENERGY CONSERVATION ACHIEVEMENTS

Following are the work carried out in different sections of the organization, which helped to achieve reduction in Energy Consumption. – Kindly refer the CD attached herewith.

Environment and Safety:

As per the Environment Policy, SUMUL is committed to continual up gradation of technology, prevention of pollution, conservation & optimum utilization of natural resources by adopting Reduce, Reuse & Recycle methods, training for environmental awareness to employees & suppliers, safe operation of the plant & equipment, complying with all the applicable environmental legislation & regulations to preserve its environment and ensure safety of its employees and further striving to go beyond legal requirements.

WATER:

- Effluent Treatment Plant of 1400m³ / Day.
- Treated water from ETP is used for Gardening.
- Rain Water Harvesting is being implemented.

AIR:

- 2 nos. Stacks for Boiler & 1 no. stack for DG set & 1 no. stack for Hot Air Generator are installed to monitor exhaust of the same.
- Monthly monitoring of stack & Ambient air carried out by M/s. Eco – Chem Sales & Service, Surat.
- Ventilation arrangement provided for improved fresh air circulation in Production area.
- We are using mainly Natural Gas & in absence of that , we are using Furnace Oil in Boiler.
- Flue gas analyzer in Boiler to monitor the % of O₂ excess air & CO in the Flue gas.

SOLID WASTE:

- Anaerobic Digester system provided for getting Bio – Gas from waste of Ghee – Butter section.
- ETP sludge is dried in Sludge Drying beds & Dried sludge is used as manure in own land.

GREEN BELTING:

- Development of Green belt in and around factory for a total area of 50,000 m².
- Various types of plants and lawns developed around factory to improve the environment.
- Lawn – 11165 m², Small plants – 20,000 nos. Mango– 15, Gulmahor-114, Asopalav-186, Neem- 151, Saru- 562, Almond- 10, Coconut -21, Nilgiri-05 & all other trees – 13. Total- 1075

Environment Management System:

- EMS activity started & ISO 14001 certification obtained from 15th May, 2002 & valid up to 2005. Periodical External Surveillance audit at certain intervals (Twice in a year) had been carried out by SAI GLOBAL, Australia, for reviewing whether EMS system is in place or not. We already pass three of such audits successfully. Recently we have commissioned dry type environment friendly transformer in place of oil type transformer.

ENERGY CONSERVATION ACHIEVEMENTS

TREND SETTER

1. INSTALLATION AND COMMISSIONING OF 1000 KVA DRY TYPE TRANSFORMERS 2 NOS.

Background

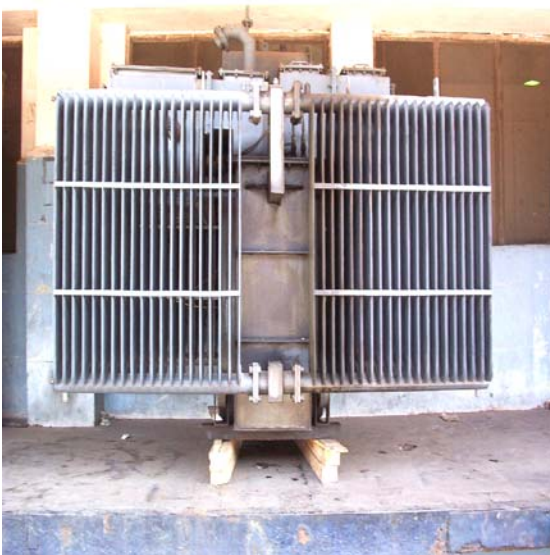
Previously oil type transformers were being used in the plant for the distribution of power. The losses were 20 units / hour from each transformer. Moreover the efficiency of the transformer was 87% at full load. Besides handling of oil was also Hazardous to the environment.

Current Status

- 🌀 Two nos Dry type (VPI) distribution transformer installed in place of oil type transformers and running at full load,

Payback

- 🌀 Annual power savings - 73000 Units
- 🌀 Annual Money Saving - Rs 3.65 Lakhs
- 🌀 Investment - 20.8 Lakhs
- 🌀 Payback period - 5.7 Years



Old Transformer



New Dry Type Transformer (99.3% efficiency)

2. INSTALLATION OF 8 NOS PLC BASED MILK POUCH PACKING MACHINES INSTEAD OF PNEUMATIC MACHINES.

Background

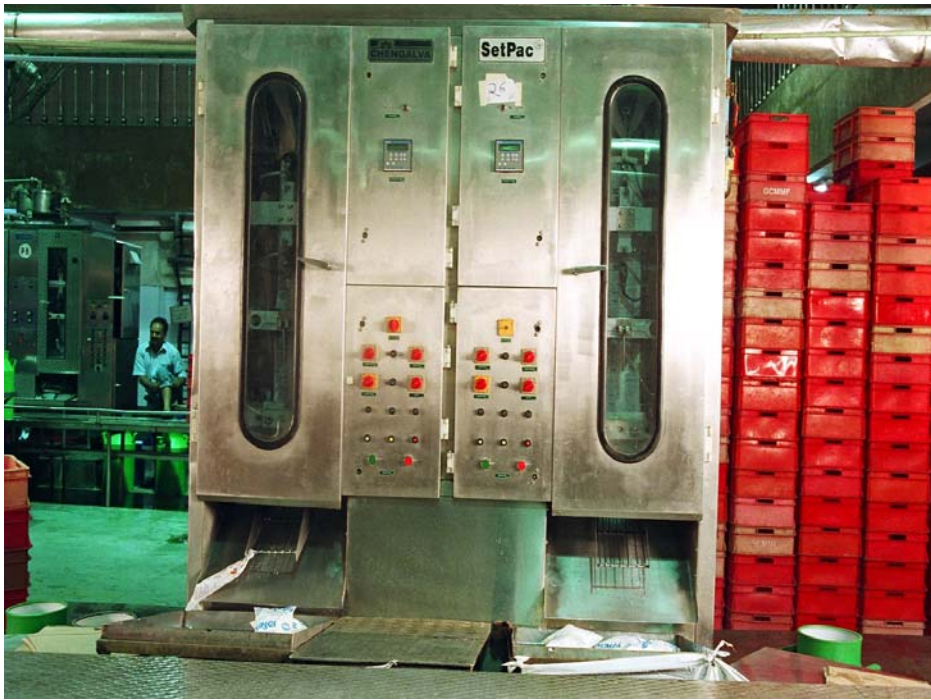
Previously pneumatically operated machines were being used consuming 35 CFM / hour of compressed air which was leading higher compressed air and power consumption.

Current Status

- 🔗 To reduce the consumption of compressed air and in turn the power, 8 Nos pneumatically operated pouch machines were replaced by PLC based machines. We are the first co-operative dairy to do the same.

Payback

- 🔗 Annual power savings - 2.19 Lakhs Units
- 🔗 Annual Money Saving - Rs 10.95 Lakhs
- 🔗 Investment - 32 Lakhs
- 🔗 Payback period - 2.9 Years



OTHER ACHIEVEMENTS

1. Installation of PLC and SCADA based Screw compressors with economizer (Two Nos.), Chilled water pumps and header system and Ammonia PHE with accumulator in the refrigeration plant in place of reciprocating compressors, individual chilled water supply pumps and separate lines.

Status:

- ⊗ The reciprocating compressors that were in use did not have the capacity control which was causing continuous running of the compressors and the start and stop of the compressor was manual based on the suction press and temp.
- ⊗ 12 Nos. separate chilled water supply pumps with individual supply and return pipe lines were in place.
- ⊗ The return chilled water from all the section was directly thrown in the IBT and the entire load was distributed in between 5 Nos. IBT'S only.

Observation:

- ⊗ Higher power consumption in compressors and pumps.
- ⊗ No volume / capacity control was available in compressor.
- ⊗ Human interference was more resulting into minor / major human errors.
- ⊗ Higher maintenance cost due to all individual pumps and pipe lines.

Action taken:

- ⊗ PLC and SCADA based two nos. of Screw Compressors with economizer and variable capacity control installed and put in operation.
- ⊗ Ammonia Plate Heat Exchanger with accumulator installed before the IBT'S so that the returning chilled water passes through the PHE and the temp of the chilled water is reduced prior to the IBT, Hence the load on the IBT is reduced and the chilling is instant.
- ⊗ New 6 Nos. Chilled water pumps installed in place of old 12 nos. individual pumps. New common header with PID control valves for each pasteurizer installed and old pipe lines removed. The Variable Frequency drive for the above said pump and a magnetic flow meter also installed for optimizing the requirement of chilled water and performance of the plant.

Payback

⊗ Annual Energy savings	- 1.82 Lakhs Units
⊗ Annual Money saving	- Rs 9.12 Lakhs
⊗ Investment	- Rs. 120.0 Lakhs
⊗ Payback period	-13months



(New Screw Compressor)



Ammonia PHE with Accumulator (-2 deg C)



Chilled Water Pumps and header system

ENERGY CONSERVATION PLANS & TARGETS

INSTALLATION AND COMMISSIONING OF CO-GENERATION PLANT 1.2 MW POWER GENERATION CAPACITY

Energy Conservation Measures (Planned)	Anticipated Savings		Approx Investment Rs In Lakhs	Expected completion date	PO No / Date	Payback Period In years
	Energy Value	Rs Lakhs				
Installation and commissioning of 1.2 MW power generator at our Sumul Dairy, Surat.	Please refer the table below	171.00	200.00 (121.45 package value and 78.55 for clearance, taxes duties etc)	31.11.04	PROJECT:IMPORTED GENERATOR:PRP:05079 Dtd 20.08.2004	1.17

% Ratio	SEC Units Daily	Generator Units Daily	Rate of SEC In Rs	Rate of Generator In Rs	Value for SEC units In Rs	Value of Generator In Rs	Expected saving in Rs for 365 days In Rs	Payback period in years
75	6250	18750	5	2.5	31250	46875	1.71 Cr	1.17

AUTO CONTROLLING OF AIR COMPRESSOR THROUGH VFD AND PLC.

Status:

- ⊗ Frequent loading and unloading of the compressor was observed. Loading and unloading operation was manual.

Observation:

- ⊗ Higher amp drawing
- ⊗ The compressed air load on the plant side was observed to be very abrupt which was causing frequent loading and unloading of the compressor.

Action taken:

- ⊗ PLC and Variable frequency drive were installed for auto controlling of the compressor load.

Payback

- ⊗ Annual Energy savings - 40880 Units
- ⊗ Annual Money saving - Rs 2.04 Lakhs
- ⊗ Investment - Rs. 14.0 Lakhs
- ⊗ Payback period - 7 Months

 **OTHER PROJECTS**

Sr. no.	PLAN	SCHEDULE YEAR	ANNUAL SAVING	
			LAKH KWH	LAKH (RS.)
1	20 KLPH Milk Pasteurizer to be replaced by 30 KLPH Milk Pasteurizer with higher efficiency (93% regeneration efficiency)	2005-06	13.5 TR	4.0
2	Installation of water meters and recording/monitoring / controlling of the same (ORDER PLACED)	2005-06	2.1kl	0.48
3	Redesigning of ETP to use 100% water for gardening	2005-06	165000m3	36.5
4	Soft starter for Supply fan in powder plant	2005-06	15750	0.78
5	Soft starter for Exhaust fan in Powder plant	2005-06	10125	0.50
6	Installation of VFD for water supply system.	2005-06	6110	0.3
7	Installation of new HT Vacuum circuit breaker	2005-06		
8	Installation of new PCC	2005-06		
9	Bio gas production through ETP	2005-06	124410 m3/y	35.15
10	Automation of process	2005-06		200
11	Pouch filling machine conversion from Mechanical to PLC based – 7 Nos	2005-06	408000	20.44
12	Energy efficient cold storage with PUF panel – 21. TR	2005-06		