

Hindustan Coca-Cola Beverages Private Limited

Madura Nemam Village., Vellavedu Nemam Post

Thiruvallur High Road, Thiruvallur Dist. Pin 602 107

Phone 044 - 26494134 -138. Fax 044 - 26273850



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Unit Profile:

HCCBPL - Hindustan Coca-Cola Beverages Pvt. Ltd, Nemam, Chennai, was established in year 1997. It is located at Madura-Nemam village, Vellavedu on Chennai - Thiruvallur Highway. The manufacturing unit is located on an area of 49 acres and has a Capacity of producing 600 Bottles per Minute (BPM) of Aerated Soft drinks & 225 BPM of Juice Drinks.

The plant is equipped with sophisticated & imported Manufacturing facilities to sustain '**Symbol of Quality**'. Following are the major brands produced in various pack sizes. **Coca-Cola, Fanta, Sprite, Limca, Thumps up, Maaza and Kinley Soda**. At market, we have **Post mix & Pre Mix** Fountain Operations along with **Georgia Tea & Coffee** Vending Machine Operations.

Systems in Place:

"We believe in systems as it inhales constraints & exhales Customer & Consumer satisfaction"

The Plant has Implemented "The **Coca-Cola** Quality System" (TCCQS) which is a Quality Management System practiced by all the Bottling plants across the world. Present TCCQS Evolution 3 encompasses both External & Stringent Internal **Quality Management Systems**.

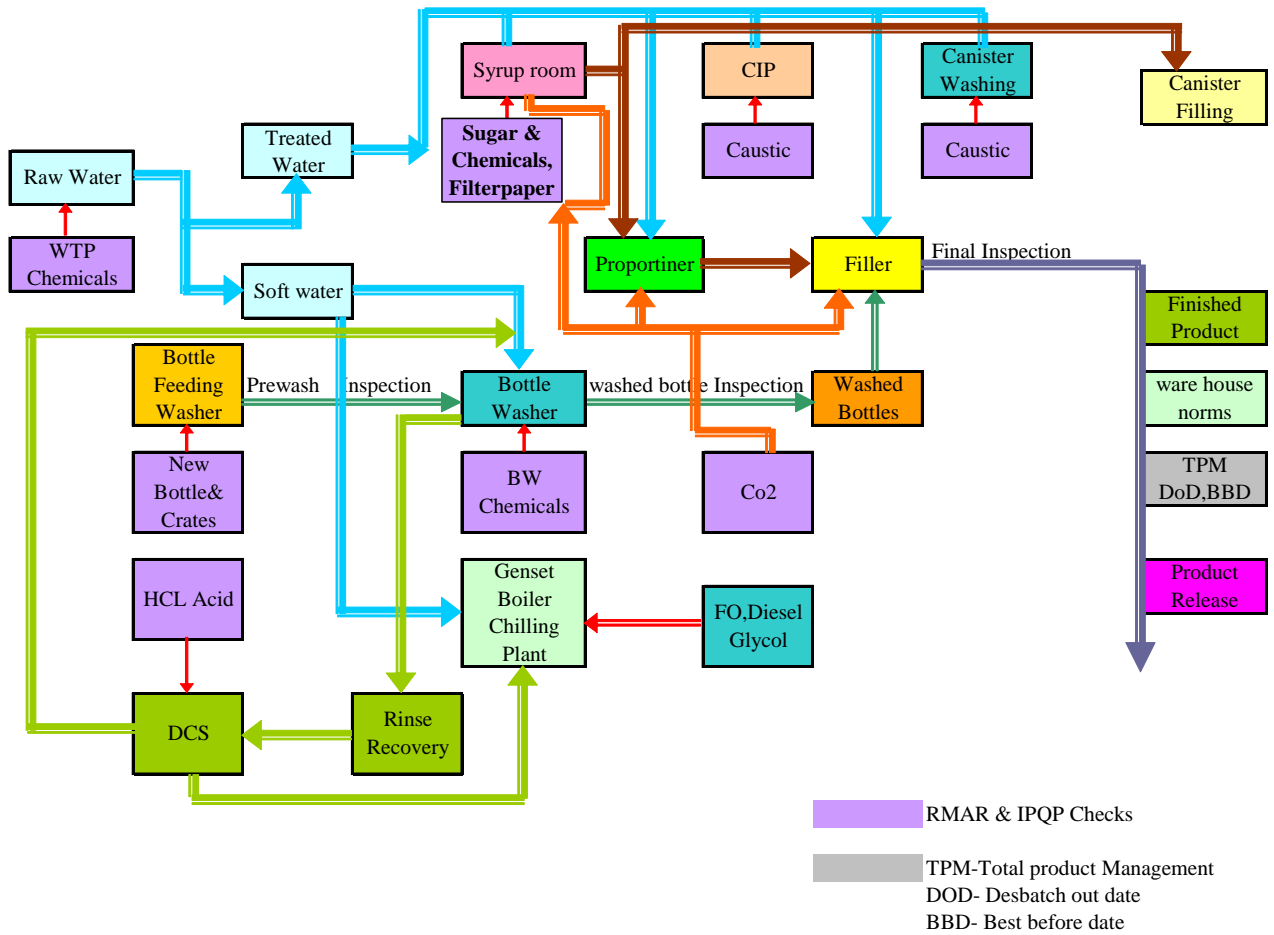
External: ISO 9001-2000 (Quality Management System) awarded in 2003, **ISO 14001-1996** (Environmental Management System) awarded in 2003, **HACCP** (Food Safety Management System) awarded in 2004 and going for **OHSAS** (Occupational Health & Safety Administration Standards) Certification in 2006.

Surveillance Audits for all the above systems is being carried out at regular frequencies & Plant has successfully cleared all the audits till date.

Internal: eKO (The Coca Cola Environmental Management System), **eSLP** (Environment Safety & Loss Prevention), **WRM** (Water Resource Management), **EMS** (Energy Management System), **Waste Management, Waste water Management. Etc.,**

These above mentioned Internal QM Systems have been implemented for achieving the continual improvement which will be audited internally to identify further areas of Continual Improvement. With regard to Implementation & Sustainenance of Environmental Management, we had taken the following Initiatives in our unit:

PROCESS FLOW DIAGRAM



Water Resource Management System

We have following 5R system for our Water resource Management.

1. **Reduce**
2. **Recover**
3. **Recycle**
4. **Reuse**
5. **Recharge**

Methods adopted for Water Resource Management

- a) Water need assessment
- b) Water consumption monitoring system
- c) Waste minimization through study
- d) Implementing recycle and reuse in the same system.
- e) Water recovery from waste water and reuse at utility block for steam generation and other places.

Reduce

1. Maaza line bottle washer final rinse jet modification
2. CSD line washer final rinse water reduction by pressure regulation valve
3. Juice line Cleaning in Place system final rinse collected and used for next cycle pre rinse

Recovery

1. Canister washer recovery
2. Back wash recovery
3. Vacuum pump cooling water recovery

Recycle:

1. Caustic water collected from washer and recycled
2. Reverse Osmosis reject water used as soft water
3. Effluent waste water recycled
4. Sewage water treated and used for gardening.

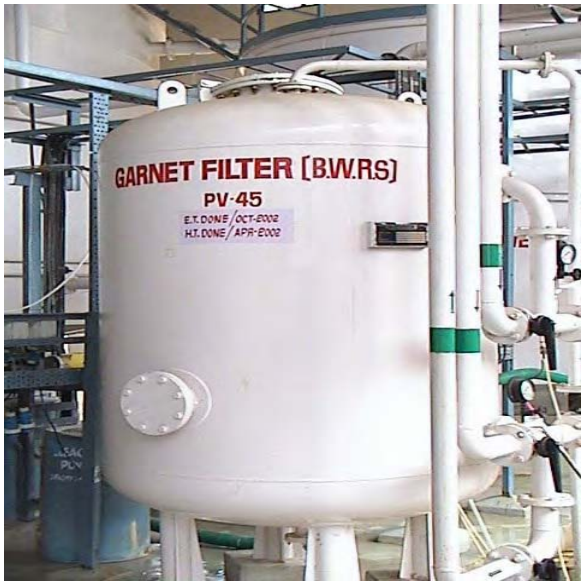
Reuse:

1. Condensate recovery
2. Cleaning in place system final rinse water reuse as pre rinse

Recharge:

- Rain water Harvesting
- Roof water Harvesting

Water Recycle and reuse System



Recharge through Rain water harvesting system to improve water table source:

Using sophisticated weather monitoring station, the rain fall is recorded and the quantity of Recharge is calculated for the area.

Rainwater Harvesting Pond



WATER RECOVERY AND REUSE

Through a modern technology reverse osmosis unit which requires NO chemicals only Physical pressure and recover water from waste water and being reused at out utility block for minimizing pure ground water consumption thereby saving ground water.



Energy Management System:

Plant having an Energy Management Team headed by our Plant Manager. Company identified an Energy Coordinator for identifying and implementing the proposals. This energy Management

committee having members in various departments and they meet in a regular basis and review the progress of implementation activity and identify new areas for energy conservation.

Year 2005 Plant have procured a Load Manager. Use this instrument energy audits are being conducted at regular frequencies to monitor the consumption trend. The following activities are identified.

Power Factor Improvement:

1. Plant overall power factor noticed was 0.99. In higher capacity motors, the PF is very low. By compensating the power factor we have connected individual capacitors directly connected to the motor terminals in Air Compressors and Refrigeration Plant main drive motors.

Plant Air Conditioners:

2. Energy audit conducted in the plant Air conditioners and packaging units. Based on the audit we have planned to install fans instead of room air conditioners.

3. Compressed Air Usage:

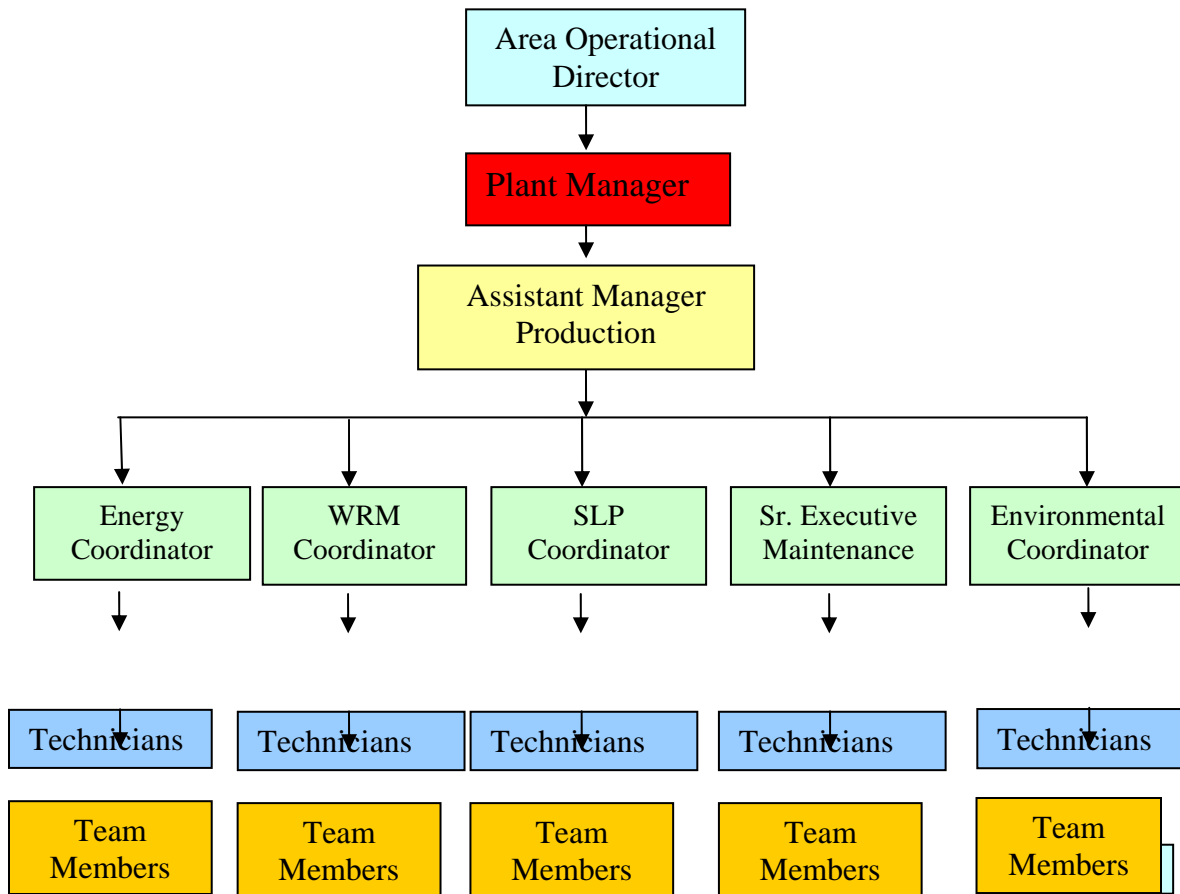
After beverage filling, we have an inkjet printer for printing batch number and MRP in the bottles. For improving the print quality we have used compressed air for removal of water substances on the bottles. The air usage estimated was 25 CFM. By avoiding the compressed air usage we have installed an individual lower capacity blower with the capacity of 2.2 Kw motor.

4. Insulation of Bottle washer outer Surface:

Washer which one is used for washing the dirty bottles collected from the market. The temperature maintained for washing is 74 deg C. By avoiding the thermal radiation and heat loss plant has decided to insulate the outer surface of the bottle washer by 75 mm rigid glass wool LRB to the density of 48 kgs/m³ in the form of sandwich insulation with stitched glass cloth with suitable weather protecting coating.

The investment required for insulation of bottle washer is 16 lacks. The savings estimated is 13 lacks annually. The payback period estimated is 15 months.

Energy Conservation Cell Structure



Energy Audit:

In year 2001 our Corporate Energy Audit team conducted an Energy Management training program with the help of **Confederation of Indian Industry Energy Management Cell (CII)** for our team and issued certificates for qualified Associates.

In year 2002 August **Confederation of Indian Industry Energy Management Cell (CII)** conducted a detailed Energy Audit in the plant. The audit comprised the following activities

1. Detailed data collection of major power consumption equipments.
2. Operating parameters and production process.
3. Power measurements of major feeders
4. Analysis of collected data's
5. Report submission

During the audit 14 Proposals are identified. All the proposals are completed within the time limits and the reports were submitted to the State Government Electricity Board.

In Year 2003 our corporate energy Audit team conducted an audit and they have identified some areas. They had recommended procuring a load manager for our plant. Now we are conducting energy audits internally.

Commendable Landmarks of our Plant Till date:

- a. **WRM Award:** Awarded "WRM Award" for the year 2002 for better & optimum utilization (Lowest Water Ratio) of natural resource "**WATER**" by deploying different types of "Reduce, Recover, Recycle, Reuse & Recharge" schemes in our plant.
- b. **PLP Rating:** Moved from "**Double Penalty**" to "**Single Penalty**" rating in terms of **Property & Loss Prevention system**.
- c. **Safety Performance:** Awarded Runner Up for the Best Safety Performance activities among our bottling units in India.
- d. **First Plant in India to initiate Recruitment of **Physically Challenged Personnel** (Deaf & Dumb):**

In the Year 2002, 30 Physically Challenged personnel were trained for bottle inspection, since the job involves mere visionary skills & negligible physical strain, suiting the abilities of the above personnel. It was a Win Practice for both Company & the Society. The personnel are identified from **Vocational rehabilitation Centre for Handicapped, Guindy-Chennai- 32**

Till date the No. of Physically Challenged personnel working stands to **75**. **The Government of Tamilnadu has recognized the Practice as best initiative towards recruitment of physically challenged among the Industries & awarded "**Best Private Employer**"** on the eve of Independence Day for the year 2004. This Best practice was shared with plants across India & majority of the plants have started to implement the same.

Major Energy Saving Activities Implemented in the Plant from year 2002:

1. Steam Heater for Boiler Furnace Oil Pre heating
2. Steam Condensate water recovery
3. Increasing the boiler feed water temperature by reducing the feed water capacity and insulation of tanks
4. Adding additives in Furnace oil
5. Using transparent sheets in plant warehouses for natural lights.
6. Solenoid valve auto cut off for major compressor air usages
7. Refrigeration type coolers for compressed air moisture separation
8. Pressure optimization in pneumatic operations
9. Using proximity and Photo electric sensors for conveyor cut off
10. Timers for ETP Aeration tanks with respect to the Dissolved Oxygen Level
11. Timers for Biox Air blowers
12. Providing opaque glass in Air conditioned rooms windows
13. Danfoss make Variable Frequency Drives (VFD) for Pumps
14. Using Pressure transmitters for Water treatment treated water pumps
15. Transferring raw water to treatment plant by Gravity
16. Using Flue gas analyzer for measuring boiler thermal efficiency
17. Avoiding daily run checks and idle runs in Generators for fuel wastages
18. Using automatic power factor controllers in capacitor banks for improving the Power Factor ratio to 0.99
19. Individual capacitors connected directly to the motor terminals for improving the motor efficiency
20. Limit switches for Air Curtain doors
21. Energy saver- Electromizer for Plant lighting
22. FRP Fans instead of Metal fans in cooling towers
23. Variable frequency drives for Air handling Units
24. Flat belts instead of V belts in Air compressor
25. Water recovery systems

26. Using ETP RO water for plant Utilities
27. Using energy efficiency lamps instead of conventional fluorescent lamps
28. Interlocking of condenser pumps and fans in refrigeration plants.
29. Variable frequency drives for raw syrup transfer
30. Single glycol well system in refrigeration plant - hot well by pass

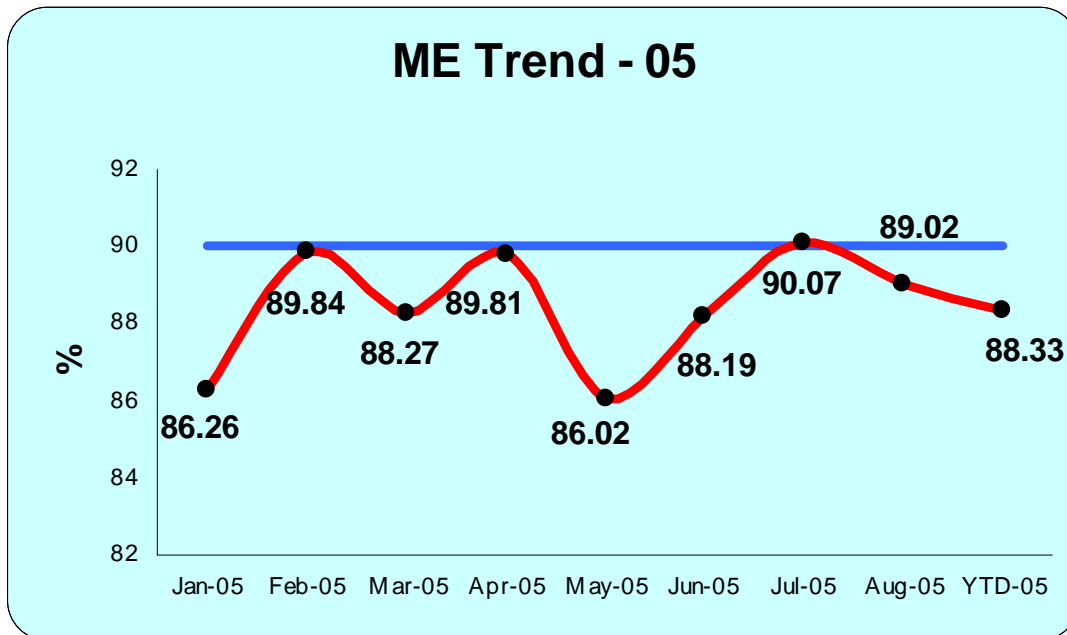
Goals and Objectives year 2005: *More products with less energy*

1. To maintain the Electricity usage at 12.0 (Liters of Bev / KwHr Usage)
2. To Maintain Furnace Oil usage at 65.00 (Lt of Bev/Lt of Oil)
3. To Maintain the water ratio at 2.67 liter of beverages
4. To Maintain the Mechanical Efficiency at 90 %
5. To maintain the Plant Efficiency at 75%

Year 2005 Mechanical Efficiency Trend Target is 90 %

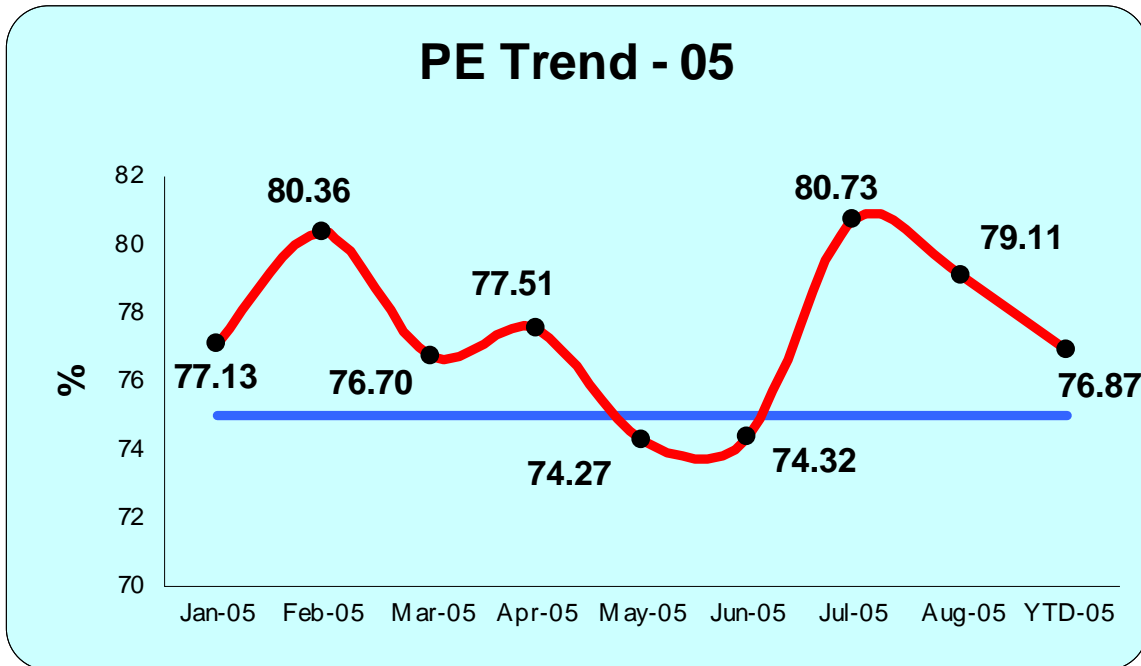
By adopting following bullet principles we have achieved the Mechanical efficiency 90%

- *Daily hourly monitoring of production outputs and break downs*
- *Taking Corrective actions*
- *Continuous Production plans*
- *Lengthier batch sizes*
- *Total predictive maintenance system in place - **Computerized maintenance management system***
- *Skill gap analysis and training to the operates based on the gaps*
- *Regular periodic maintenance*
- *Spare management*



Year 2005 Plant efficiency trend Target is 75

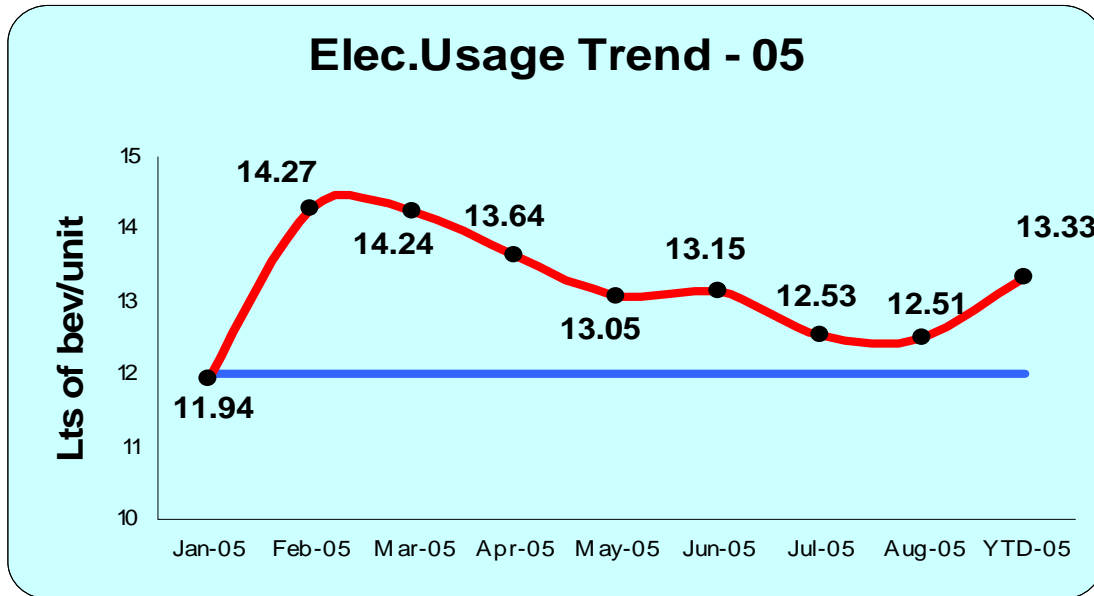
Reduction of changeover timings by multi skills -inspectors assist operators during change over.



Year 2005 Electricity trend - Target is 12

Electricity yield is calculated on the basis of Kwhr consumed for producing one liter of beverage produced.

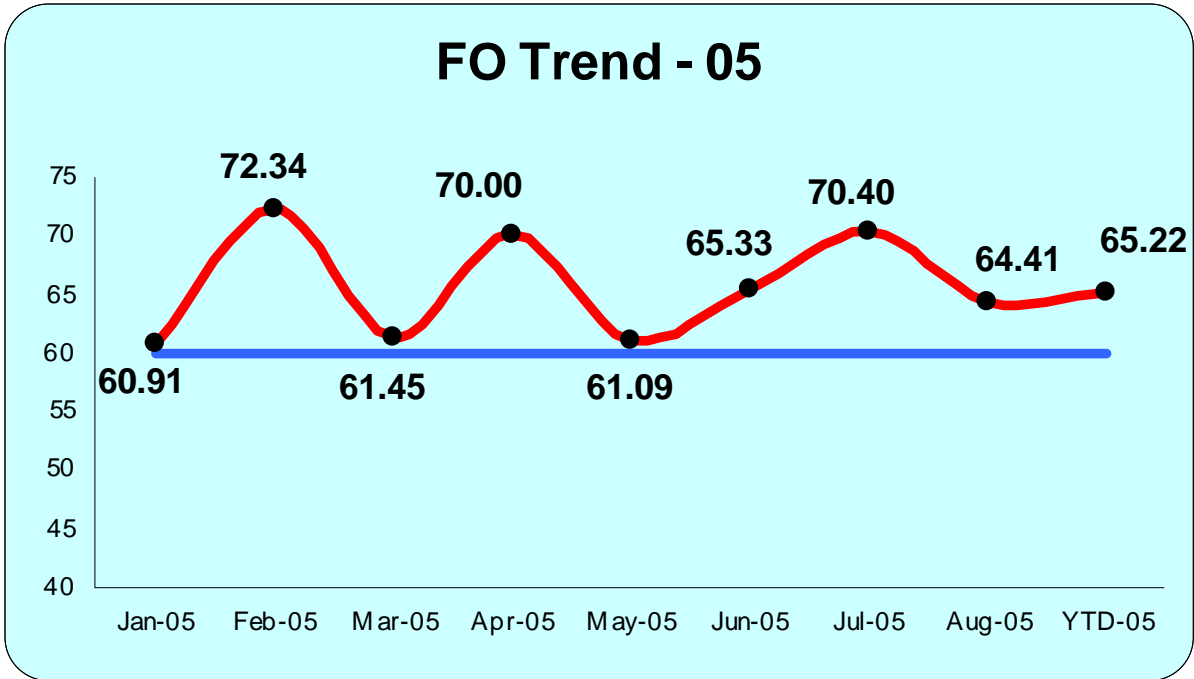
- *Implementing new energy saving activities*
- *Avoiding unwanted loads*
- *Energy Audits*
- *Monitoring of daily consumption by department wise and machine wise.*
- *Identifying major consumption areas and equipment*
- *Adopted scientific approach in optimizing the consumption in major consumption areas. For e.g. Refrigeration plant single glycol well system*



Year 2005 Furnace oil trend - Target is 65

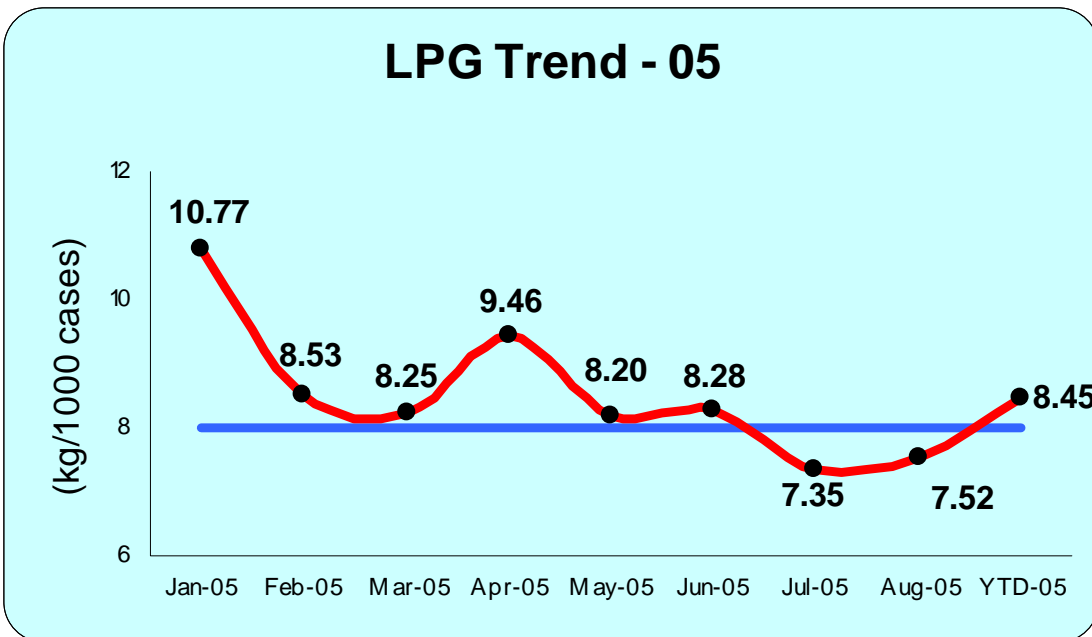
Furnace oil yield is calculated on the basis of liters of oil consumed for producing one liter of beverage produced.

- *Increasing the feed water temperature by de rating the capacity of feed water tank and insulation of lines*
- *Switchover the 5 ton capacity boiler to 2 Ton*
- *Insulation of bottle washer outer surface for heat radiation loss*
- *Increasing the condensate recovery by changing the type of steam traps from TD type to float type.*
- *Increasing the condensate recovery from 35 to 70 percent.*



LPG usage Trend Target is 8.5gm/1000 cases

LPG gas is used for only fork lift operation. It is calculated in terms of LPG in grams consumed for shifting 1000 cases.



2005 Goals and Targets YTD

2005 YTD Mechanical Efficiency is 88.33. For achieve 90 we have planned to change the production pattern in lengthier batch sizes.

For Electricity yield the target is 12.00/Lts of bev/Kwhr Consumption. Actual Ytd 2005 is 13.33. This is by adopting new technologies and energy studies in the plant.

For Furnace oil consumption we have planned to install 2 Ton boiler instead of 5 Ton.

Major Energy Conservation Activities implemented during the year 02-05

1. Variable frequency drives for Treated water pumps:-

Previously the treated water supplied to the process with a capacity of 7.5 Kw pumps 2 nos in a working pressure of 5-6 kg/cm² in a common header. After modification two treated water pumps are operated in closed loop with a pressure feedback from the pressure sensor and the pressure transducer fixed on the common header. The pressure was maintained at a optimum level of 4 bar to meet the process requirement of beverage production. VFD frequency was clamped between 35 Hz and 50 Hz.

Capacity of the VFD 15 Kw

Cost of VFD 100000/-



Pressure Transmitter



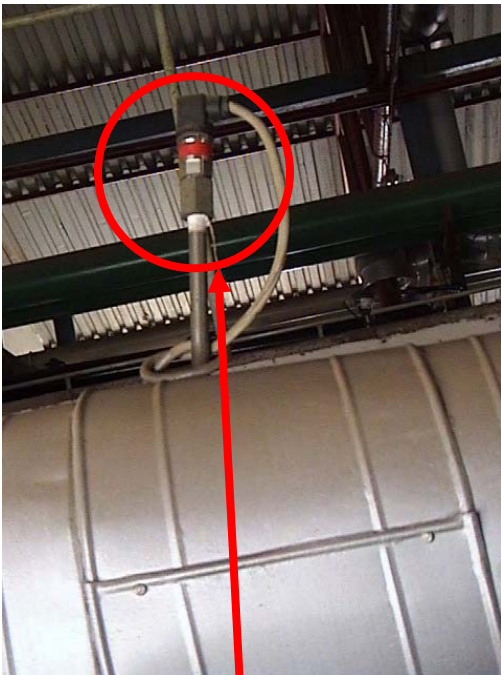
VFD Panel

VFD commissioned on	Mar-02
Connected load	7.5 Kw X 2
No of VFDs connected	1
Treated water pumps operating frequency	42.8 Hz
Total hours of operation	16113.1
Units consumed per hour	3.58

Existing consumption without VFD	7.8
Savings per hour in treated water pump	4.22

2. Variable frequency drives for Refrigeration Plant Cold well pumps:

Two secondary Glycol cold well pumps with a capacity of 9.3Kw are operated in closed loops with a pressure feed back from the pressure sensor and the transducer fixed on the discharge header. The pressure was maintained at a optimum value of 1.5 bars to meet the cooling requirement of the beverages. The Cold well Glycol pumps operating frequency is clamped between 35 to 50 Hz operations.



Pressure Transmitter



VFD Panel in Chilling Plant

VFD commissioned on	Mar-02
Connected load	9.3Kw X 2
No of VFDs connected	2
Treated water pumps operating frequency	40.7
Units consumed per hour	3.94
Existing consumption without VFD	8.9
Savings per hour in cold water pump	4.96

3. Variable frequency drives for Air Handling Unit:

The syrup room having 20 000 cfm capacity of Air handling units 2 nos with a connected load of 7.5 Kw Motors. With the help of Anemometer the air volume is calculated. The recommended air change inside the syrup room is 18. Based on the readings the operating frequency of the Air handling motors speed is reduced with the help of Variable frequency drives.



VFD commissioned on	Mar-02
Connected load	11Kw X 2
No of VFDs connected	2
AHU operating frequency	37.5
Exiting consumption per hour	6.90
Consumption with VFD	3.19
Savings per hour in AHU Motor	3.71

4. Limit Switches in Door Air Curtain Fans:

In most of the Plants air curtains are running continuously. By providing limit switches or sensors, these air curtains can be switched ON or OFF when ever required. By providing limit switches or Sensors in the Air Curtains control system, the air curtains will get switched ON/OFF whenever the door gets opened and closed. Savings potential depends on the number of air curtains.

We have completed this modification on July 02

Investment required for fixing arrangements and Switch Rs. 1100/-

Connected Load is 0.375 x 4 Nos = 1.5 Kw

Energy Consumption in the air curtains before modification 1.2 Kw/Hr.

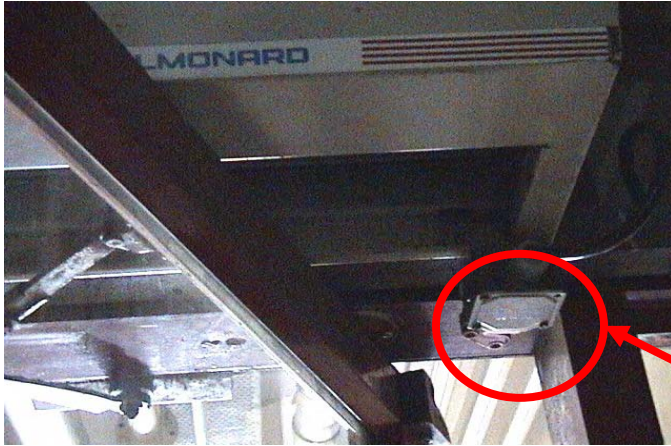
Total consumption in a day 1.2 x 24 = 28.8 KwHr

Approx energy consumption in a day after this modification 1.2 x 2 = 2.4 KwHr

Savings estimated in a day 26.4 Kw

Pay back period = Savings in a day x No of working days in the Month/investment

26.4 x 4.75 x 25 / 4400 = 1.4 Months.



Door limit Switch

For smooth operation and increasing motor life Sensors and timers to be used and activate the operation of the sensors at least one meter distances before entering the hall.

5. Electromizer - Lighting Energy Saving Device

Electromizer" is specially made for applications on discharge lighting devices such as Sodium, Mercury and fluorescent lights. The electromizer is essentially a **loss less** reactance coil introduced in the lighting feeder which reduces the voltage applied across lighting devices which are connected in parallel to the feeder. Such reduction in voltage with in certain range improves the lighting device efficiency without affecting operations of that area.

The design of electromizer ensures that the total losses do not exceed 0.6% of the total input electrical energy. While the resulting savings are of the order of 20 to 25 percent of the input energy.

Some additional features incorporated in the Electromizer is

1. By pass switch for emergency use in the event of very low input voltage
2. Switch Fuse Unit provision to prevent the damage of the Electromizer in case of over load of short circuit.
3. Three tapings are provided for selection of output voltages for varying input voltages



Before doing this modification in the lighting feeder our lighting consumption is 15 % in overall plant consumption.

After this modification the lighting consumption is drastically reduced to

Connected capacity is 225 KVA
Investment for this Project Rs.225000.00

Month	2001-02	2002-03	Savings	
Apr-01	23504	21848	1656	7.05%
May-01	27128	19960	7168	26.42%
Jun-01	31024	22424	8600	27.72%
Jul-01	20960	15120	5840	27.86%
Aug-01	21712	14616	7096	32.68%
Sep-01	30096	17064	13032	43.30%
Oct-01	20472	11560	8912	43.53%
Nov-01	20184	11312	8872	43.96%
Dec-01	23488	17440	6048	25.75%
Jan-02	15848	13384	2464	15.55%
Feb-02	19552	17000	2552	13.05%
Mar-02	27648	20152	7496	27.11%
Total	281616	201880	79736	28.31%

Pay back Period = Investment / Savings per year / 12 = 7 Months.

6. Individual capacitors in Air Compressors:

Since our plant maintained an overall power factor of 0.99. In air compressor the motor end power factor noticed was 0.8 lag during loading and 0.38 lag in unloading. This is due to the increasing of KVAR factor in the motor end. By compensating the KVAR factor we have to connect an additional capacitor of 10 kvar in the motor terminals. By connecting the capacitors near the load side, the magnetizing current near the load points to be eliminated hence there is a reduction in the system current. It will help us for improving the voltage, PF and reduce the cable loss.

The following readings were noticed during the time of audit

Parameters	without capacitor		with 10kvar capacitor	
	Load	Unloading	Load	Unloading
KVA	23.5	13.92	18.45	6.9
KW	19	6.1	17.73	5.2
KVAR	13.74	12.5	4.6	3.6
PF	0.8	0.38	0.96	0.78
Voltage	412	413	414	415
Current	32.09	19.16	25.58	9.5
Frequency	49.69	49.73	49.69	49.69

Investment for capacitor is 2000.00

Savings is $1.27 \times 20 \times 4.75 \times 250 = 33178$ PA

Pay back period is $2000 / (33178/12) = 0.72$ months, i.e. 22 days.

We have completed the project on Jan 2005

7. Down sizing of Boiler feed water tank

Previously the insulated feed water tank used for boiler operation is 10 KL. The condensate water recovery collecting from various application in the plant measured was 75 deg. But in boiler in feed the temperature in the boiler feed water is around 50 deg. This is due to over size of the boiler feed water tank. (10 KL). For increasing the boiler feed water temperature, the exiting tank was down sized to 4 KI capacity.

After this modification in the feed water tank the in feed water in the boiler was 80 deg C.



New 4 KL
Tank



Old 10 KL
Tank

8. Conversion of Cooling Tower metal fan blades to Aluminum:

Aluminum Fan Blade is heavier in weight and the angle of Blade was 12 degree while in rotation. Current recorded earlier was 7.1 A for 5.0 HP motor.

After replacing the lighter weight FRP Blade and adjusting the blade angle to 8 degree in rotation. Current is reduced to 6.0 to 6.1 A for the same motor.

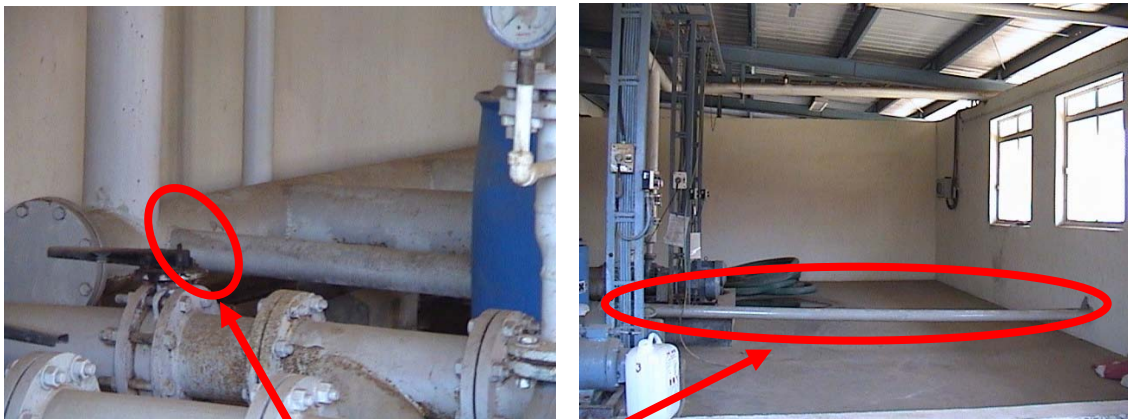
The savings estimated was Rs.8520/- per annum.

9. Gravity water transfer from raw water tank to Water Treatment plant:

Water from the bore well is collected in the raw water storage tank with a positive static head of 3 meter. From the tank water is transferred to an underground tank in water treatment plant. For this transferring 11 Kw centrifugal pump is used. The positive head available in the raw water tank is more than sufficient to transfer water from raw water tank to UG sump in treatment plant.

For this modification the exiting over head water pipe lines has modified to ground level. By this the operation of the centrifugal pump is totally eliminated

Present power consumption is 12.5 Kw



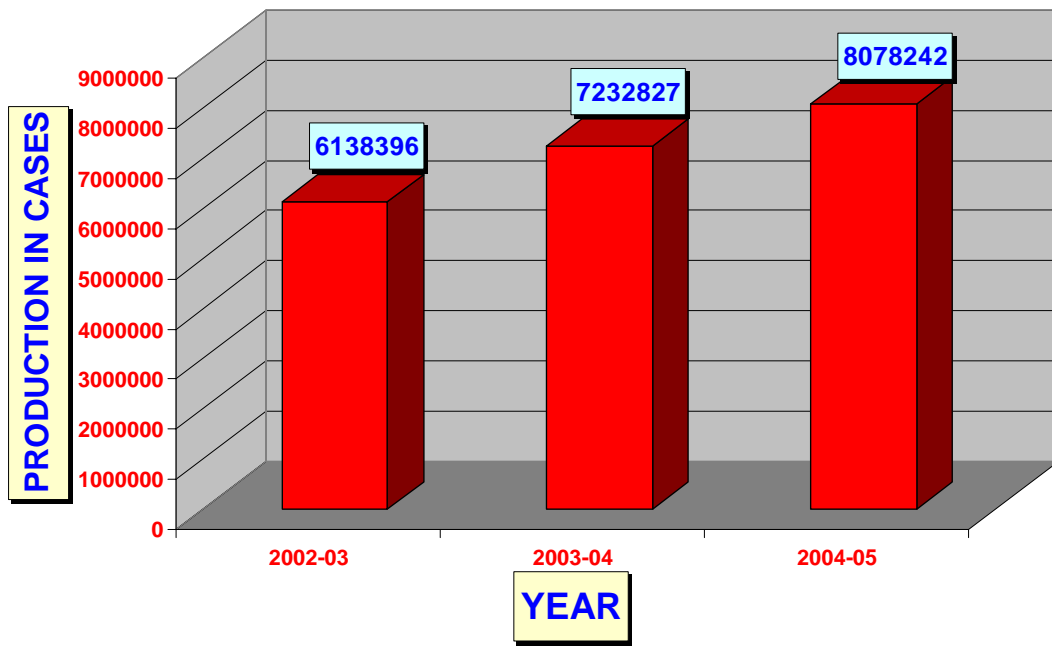
Gravity Flow
Tapping

10. Voltage drops in Feeder:

The overall power factor of the plant is 0.99 Lag. The Power factor of SSB -7 feeder is found 0.77 and an voltage drop of 4 volts was found during audit.

By compensating the voltage drop and increasing the power factor in the load end we have connected 25 KVAR capacitor with SFU arrangements and interlocking arrangements with the feeder for avoiding the switching of no load times.

Production Trend



Environment



Coca-Cola India

ENVIRONMENTAL POLICY

We at Coca-Cola India are in the business of beverages that refresh people. We will carry out our operations in ways that Protect, Preserve and Enhance the Environment we work in. Our activities are guided by Coca-Cola eKOs^{ystem}, which provides a framework to transform this principle in actions.

Towards this objective, we shall endeavor to:

1. Establish, maintain and operate facilities to comply with all applicable Environmental Safety and Health laws, Statutes and Consents.
2. Formulating sound environmental objectives and targets and integrate a continuous process review in all essential elements of corporate management.
3. Conservation of natural resources specifically in water, energy and Fuel by continually improving its usage and reducing wastage.
4. Working as a catalyst to enhance collection of post consumer PET bottles through awareness programs and synergizing relevant agencies for getting better pricing to the consumer.
5. Seek co-operation with Public, Private and Governmental Organisations in identifying solutions to relevant environmental issues.
6. Advertising initiatives are to be critically evaluated while advertising in Eco-sensitive areas. Do not put advertisements on Historical Monuments, Religious, Political Buildings & Structures and other specially protected and sensitive areas.
7. Using cooling equipment with environmentally friendly technologies.
8. Managing fleet operations in a manner to minimise environmental impacts by ensuring good maintenance, improving and tracking fuel efficiency and managing wastes.
9. Ensuring procurement policies that consider the environmental impact of packaging materials and all direct and indirect process aids used within the operation.
10. Ensuring all operations implement eKO Management System and requirements under ISO 14001 before December 2004.

This policy has been communicated to all associates of Coca-Cola India to ensure compliance and shall be made available to public and interested parties on demand.

Sanjiv Gupta

Sanjiv Gupta
President
Coca-Cola India



September 21, 2003

Safety and Loss Prevention Policy

We at Coca-Cola have high regard for all associates and are committed to provide a Safe and Healthy work environment. We believe that Safety must function as an integral part of each of our operations throughout the value chain. It is the responsibility of the management to provide leadership in implementation of Safety standards and programs. We also believe that it is the responsibility of each associate to ensure the compliance of these programs.

In fulfilling this responsibility, we adhere to the following guiding principles:

1. We proactively seek to identify and control potential health, workplace and fleet safety hazards.
2. We strive to consistently adhere to standard operating procedures, which are designed to prevent injury, illness and accidental loss to the person or property.
3. We establish and maintain programs to ensure the compliance with applicable laws and regulations and wherever laws and regulations may not be adequately protective or do not exist, we adopt The Coca-Cola Company standards.
4. We continually train and educate our associates to perform their job without endangering themselves or others and also preventing vehicle accidents and minimizing risk to property.
5. We prepare for potential emergencies to protect associates, prevent property losses and business interruptions.

The success of this Safety and Loss Prevention Program is the responsibility of everyone from Chief Executive Officer to the most recently hired associate.