



## ITI Limited ,Mankapur, Gonda(UP)

### UNIT PROFILE:

ITI Limited is the first Public Sector Undertaking established in the year 1948 at Bangalore to meet the total telecom requirement of country. Mankapur Unit was set up by the former Hon'ble Prime Minister late Smt.Indira Gandhi in the year 1982 in the eastern part of U.P. to manufacture 500 Kilo Line of Digital Switching Equipments (E10-B) under the technical collaboration with M/s ALCATEL, France. The Capacity extended to manufacture 500 Kilo Line of CSN (OCB 283 technology) during 1993-94. The unit started MAX-L/XL production also during the year 1998-99, and established all necessary infrastructure/facility by the end of year 1999.Hon'ble Chairperson UPA Smt.Sonia Gandhi inaugurated GSM – BTS manufacturing facility under the technical collaboration with M/s ALCATEL, France on 07<sup>th</sup> July 2005.

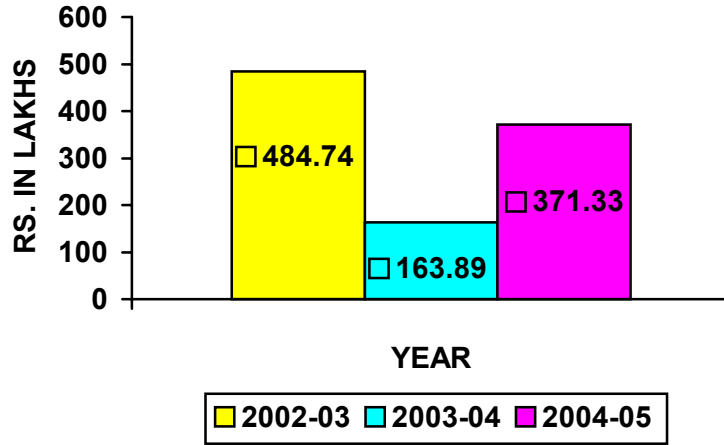
### ENERGY CONSUMPTION:

The unit is well aware about energy efficiency & its benefits, which not only provides a highly cost effective and environmentally benign solution to meet energy demand, but also help in reduction of power cost. The Unit has accorded priority for reduction in energy consumption by putting consistent efforts towards monitoring of production / non-production operations / activities as well as company assets management. The details of energy consumption & saving achieved during last three years are as below:

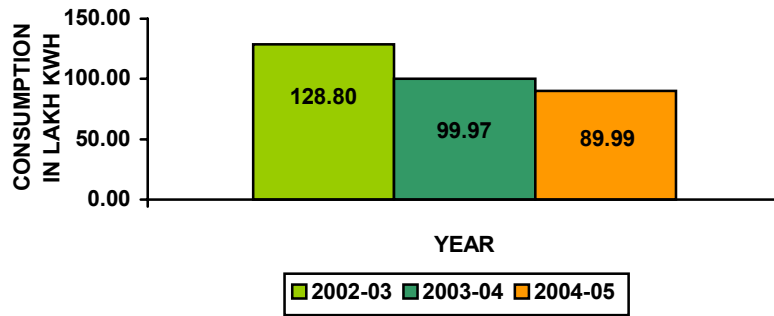
DESCRIPTION	2002-03	2003-04	2004-05
Power Purchased in L.KWH	124.94	98.36	86.29
In-House generation in L. KWH	02.86	01.61	03.70
Total Power consumption in L. KWH	127.86	99.97	89.99
Total energy cost in Rs. Lakhs	617.46	469.70	429.95
% Reduction in energy consumption over 2002-03	-	21.82	29.61
% Reduction in energy cost over 2002-03	-	23.93	30.37
Sales turnover in Rs. Lakhs	48470.57	16389.07	37133.57
Specific energy cost in % over sales	01.27	02.87	01.16

The generation cost has increased due to steep rise in fuel/lub.oil cost and enhancement of imported spare of 05X1450KVA Yanmar- Toyo Denki' make captive power plant. Though there is not considerable saving in consumption over last year but we have achieved saving in respect of last year in spite of capacity addition & extended working hours of factory to meet the production target.

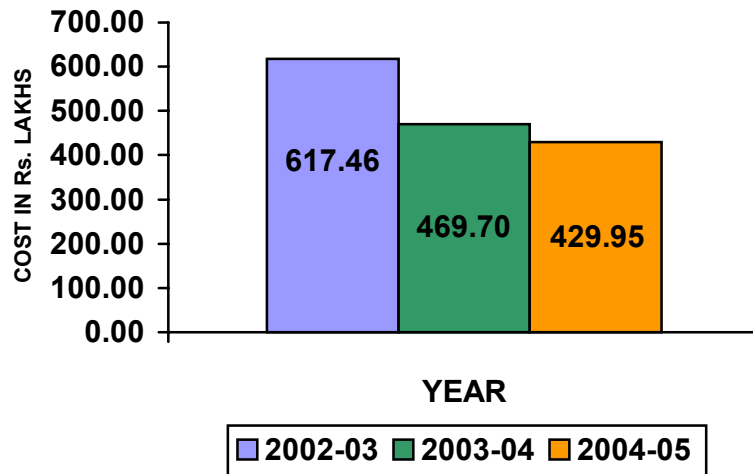
### SALES TURNOVER



### POWER CONSUMPTION



### ENERGY COST



## REDUCTION OF ELECTRICAL ENERGY CONSUMPTION:

The entire Plant load is categorized as follows:

- ❖ Air Conditioning
- ❖ Lighting
- ❖ Compressed Air
- ❖ Machine Load
- ❖ Misc

The Plant has 44,300

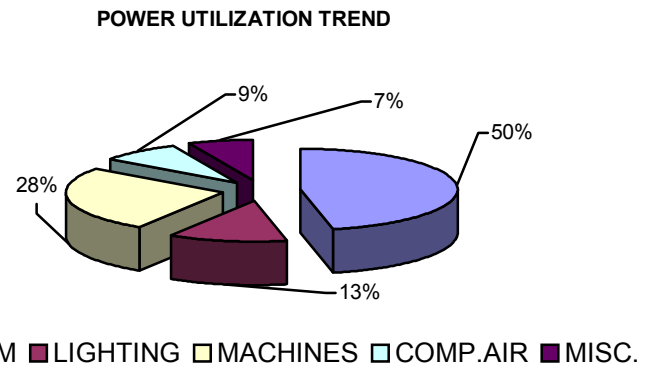
Square Meter air-

Conditioning area,

2000 Square Meter

FDV area having a

total of 77,500 Square Meter covered area. Special effort was made to reduce the energy consumption by re-scheduling the operation central air conditioning and central compressed air plants for operation of all the shops by providing dedicated window A/C and local smaller compressors to the shops for operation as per requirement. It is further to mention that since inception of mobile communication, production of landline exchange equipment has been considerably affected. Due to this reason production of any major products has not lasted for more than a year.



## Energy Conservation Commitment, Policy and Set Up:

### Commitment:

- ☞ The Unit is committed to promotion of energy efficiency and to reduce the need to create new capacities which require mobilization of huge resources.
- ☞ To intensify the in-house efforts for improving energy efficiency, Energy Conservation Cell and Core Committee have been set up by the Management.

# ENERGY CONSERVATION POLICY

We, at ITI Limited Mankapur Unit are committed to adopt energy conservation measures in all our activities, products and services across the unit.

**Our Mission is:**

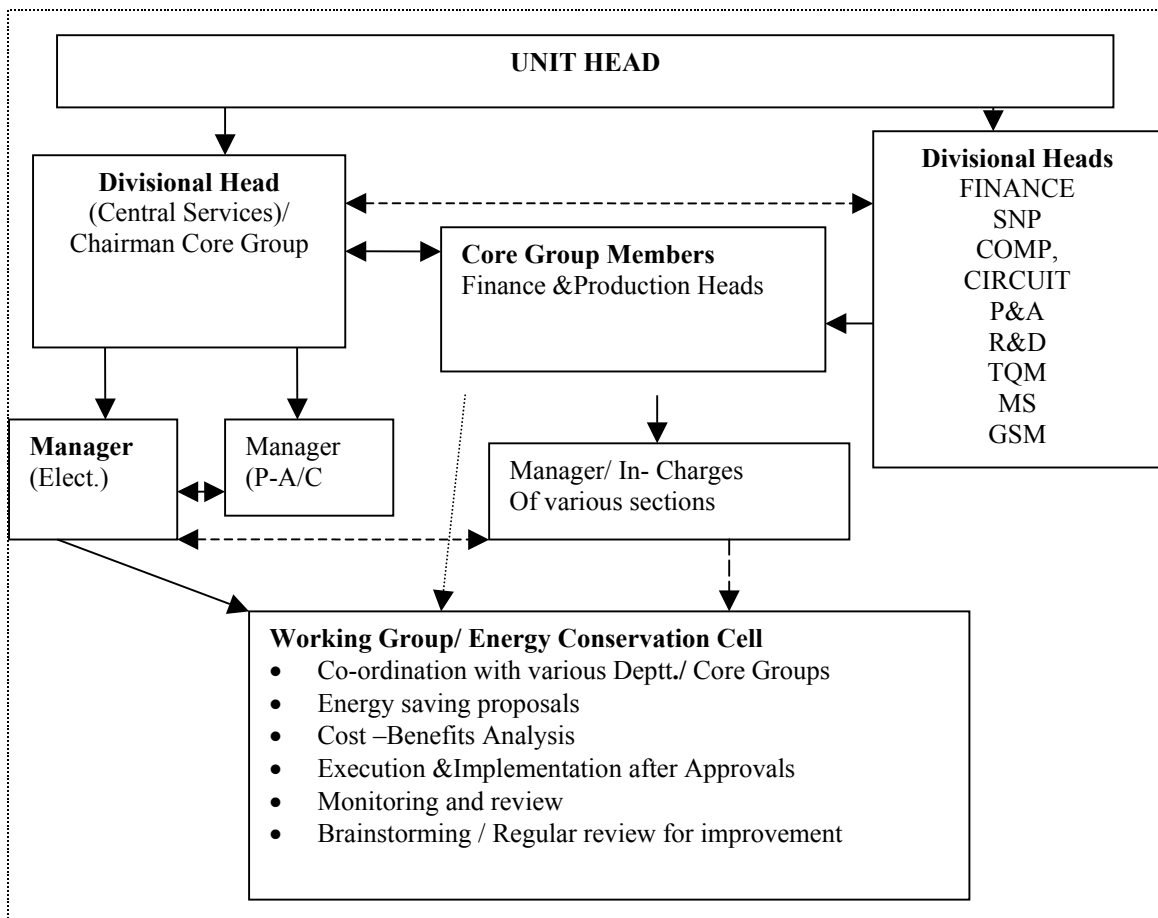
- ❑ To control energy consumption by adopting best practices and energy efficient processes.
- ❑ To control energy consumption by producing energy efficient products.
- ❑ To conduct regular management reviews to ensure continual improvement.
- ❑ To conduct energy conservation awareness programs throughout the unit.
- ❑ To recognize efforts of our employees and their families in energy conservation initiatives.
- ❑ To ensure energy consumption reduction by 05% each year.

Date : 28.09.04

Place : ITI Limited , Mankapur

(S.P.TRIPATHI)  
UNIT HEAD

## ENERGY CONSERVATION STRUCTURE:



## EC Mechanism


- \* **Monitoring and targeting** is the key to energy conservation on daily basis.
- \* **Norms** are set up on the best performance and practices in past three years.
- \* **Process Modifications** are focused to conserve the environment, economy and energy & use of non- hazardous chemical.
- \* **Small Group Activities** are conducted in –house for CAPA (corrective and preventive action) on the basis of planned and actual performance.
- \* **Brainstorming** – To promote the innovative ideas from brainstorming sessions of various groups.
- \* **Volunteers participation schemes** from all individuals, suggestions are invited for improvement in a constructive structured manner.
- \* **Six –Sigma Approach** is adopted to maintain the improvement techniques.
- \* **Create awareness** among employees and their families by conducting programs on the eve of National Energy Conservation Day.

### National Energy Conservation Campaign\_2005:




## ENERGY CONSERVATION ACHIEVEMENTS:

Major energy conservation achievements in the Unit during FY: 2004-2005 are as follows:

1	<p><b>Reduction of Contract demand from 7000 KVA to 4500 KVA</b></p> <p><b>Background:</b> Contract demand of our plant was 07 MVA. We were paying Demand Charge @Rs.180/KVA on the Contracted Demand per month in addition to Energy Charge which has the major impact on the energy bill.</p> <p><b>Observation made:</b> To reduce the contracted demand, it was necessary to have the load pattern for a year so that some of the load can be shifted from peak hours to non-peak hours. For this computerized energy management system was required to study the load pattern.</p> <p><b>Technical and financial Analysis:</b> The cost of EMS including 4 nos. energy meters were Rs.1.75 Lakhs where as reduction of 1000 KVA demand was having a saving potential of Rs.1.80 lakhs/month.</p> <p><b>Action Taken:</b> We have installed computerized energy management system by installing 4 nos. energy meters on incoming feeders .By analyzing the load pattern of one year, it was gathered that by shifting the loads from peak hours to non peak hours, we can reduce our contracted demand from 7000 KVA to 4500 KVA &amp; subsequently demand charges in our monthly energy bill. Accordingly, some of the loads was shifted from peak hours to non-peak hours. Subsequently we approach to M/S UPPCL for reduction of our contracted demand from 7 MVA to 4.5 MVA which was agreed by them w.e.f.01.04.2004. We have saved Rs.36.12 Lakh during the FY: 2004-05 towards demand charges.</p> <p><b>Savings:</b> Rs.36.12 Lakhs</p>	 <p><b>Investment:</b>Rs.1.75 Lakhs</p>
2	<p><b>Replacement of 05 nos. Cooling Tower at D.G.Sets :</b></p> <p><b>Background:</b> 05 Nos. Cooling Tower installed for cooling of our 5X1450 KVA D.G.Sets, Due to aging effect efficiency of these cooling tower has become poor and which also cause high temperature tripping of D.G.Sets while running. This is also consuming much power.</p> <p><b>Observation made:</b> We undergone through the study &amp; it was observed that efficiency of cooling towers can be improved by replacement of existing Aluminum Blades Wooden film - fill with new FRP blades and fills.</p> <p><b>Technical and financial Analysis:</b> The existing DG Sets 05Nos. Independent cooling towers have been replaced with Paharpur Cooling Towers, which is more economical and energy efficient. The saving was achieved Rs.02.38Lakhs against investment of Rs.04.80 Lakhs . The operational trouble of high temperature tripping has also been resolved automatically.</p> <p><b>Action Taken:</b> Existing old cooling towers have been replaced with new more efficient cooling towers using FRP blades and fills to resolve the operational tripping.</p> <p><b>Saving:</b> Rs. 2.38 Lakhs /annum</p>	

	<p><b>Investment:</b> Rs.4.80 Lakhs.</p>
<p>3</p>	<p><b>Replacement of under loaded low efficient UPS system at SEA Division:</b>  <b>Background:</b> The existing UPS i.e. 02X120 KVA &amp; 2X25 KVA UPS System in technical building to meet the UPS Power requirement of critical machines at SEA division.</p> <p><b>Observation made:</b> Due to age of the equipments (18 years) and old technology of existing UPS, it has been observed that efficiency has become poor and spares are being scares. The Capacity utilization was only 20-30 % This was consuming much power even on low Load .</p> <p>It was gathered that thyristor based/IGBT (energy efficient) based UPS is available in the market which is Energy efficient.</p> <p><b>Technical and financial Analysis:</b> The existing UPS works on old thyristor based technology, which have low efficiency due to large commutation involved. At the other hand the capacity utilization was less than 30 %. Power losses per anum was to the tune of Rs.12 Lakhs where as cost of one unit of 40 KVA (KW) was around Rs.05.125 Lakhs. The pay back period was less than two years. The annual saving achieved Rs.06.14 Lakhs against investment of Rs.10.25 Lakhs for 02 units of 40KVA UPS.</p> <p><b>Action Taken:</b> 2X25 KVA &amp; 2x120 KVA UPS load was replaced by installing 2X40 KVA (KW) UPS, APC make.</p> <p><b>Savings:</b> Rs.06.14 Lakhs  <b>Investment:</b> Rs.10.25 Lakhs</p>
<p>4</p>	<p><b>Decentralization of compressors:</b>  <b>Background:</b> We have 07 nos. compressors at our centralized compressor house, each compressor has 180 KW Motor. To meet the load requirement 02 compressors operate in General Shift &amp; at least one compressor operates to meet the requirement of partial load beyond the General Shift.</p> <p><b>Observation made:</b> It was gathered that BTS/CSN shops were working in A Shift &amp; B Shift. For this shop 1 no air compressor having 180 KW motor is running It is also observed that required pressure i.e.07 bar of the area can be met by providing low capacity small compressors with 0.5 cubic meter receiver near the user shops, which improve air quality as well as optimal distribution losses at lower power consumption.</p> <p><b>Technical and financial Analysis:</b> The existing higher capacity of centralized air compressors consumed more energy and more operational period due to net receiver pressure drop &amp; distribution losses .The annual saving achieved Rs.10.85 Lakhs against investment of Rs.03.05 Lakhs.</p> <p><b>Action Taken:</b> 01 no TC 50 &amp; 01 no TC 100 Compressors have been installed near the load which can operate as per load requirement during extra hours.</p>



	<p><b>Savings:</b> Rs.10.85 Lakhs  <b>Investment:</b> Rs.03.05 Lakhs</p>
5	<p><b>Relocation of Capacitors banks for PF improvement:</b></p> <p><b>Background:</b> 1700 KVAR Capacitors were installed at various substations in the plant to improve power factor of the system.</p> <p><b>Observation made:</b> It has been observed that 20 nos. of capacitors have lost their capacity due to aging effect &amp; frequent switching. It needs replacement with new ones and reallocation near the Motor Control Center.</p> <p><b>Technical and financial Analysis:</b> The capacitive current of 20 nos. capacitors was considerably less &amp; it is not improving the P.F. being KVAH base tariff .Any slight improvement in P.F. reduce the KVAH consumption as well as KVA Demand &amp; subsequently energy cost. With the present consumption trends, even though improvement of P.F. from 0.94 to 0.96 have the saving potential of at least Rs.6.65 lakhs per anum. Whereas replacement cost of 20 nos. capacitor is Rs.5.25 lacs</p> <p><b>Action Taken:</b> 20 nos. defective 25 KVAR capacitors replaced with new Capacitor (APP), which leads to improvement of power factor of the system after reallocation at MCC panel.</p> <p><b>Savings:</b> Rs.06.65 Lakhs <b>Investment:</b>05.25 Lakhs</p> 
6	<p><b>Replacement of HPMV Lamps by Metal Halide Lamps.</b></p> <p><b>Background:</b> 50Nos of HPMV lamps were installed for street lighting, which are more energy consuming &amp; less efficient lighting fixture</p> <p><b>Observation made:</b> - It has been observed that HPMV Lamp are consuming more energy to produce required lighting luminous &amp; same can be replaced with higher efficient and less cost of Metal Halide lamps.</p> <p><b>Technical and financial Analysis:</b> The existing 50nos. of HPMV 250W lamps were consuming 30000 kWh power that have 0.7 diversity factor .The Metal halide lamps have same lumens output in 25 nos lamps only. The annual saving achieved Rs.1.02 Lakh against Rs.01.10 Lakh investment.</p> <p><b>Action Taken:</b> 25 nos. of Metal halide lamps are replaced for street lighting.</p> <p><b>Savings:</b> Rs.01.02 Lakhs <b>Investment:</b> Rs.01.10 Lakhs</p>
7	<p><b>Provision of remote switching of extraction system of circuit and component division: -</b></p> <p><b>Background:</b> - The 32 nos. of extractors are installed for toxic fumes and proximity treatment of air emitted from different production processes or machines. These are taken in operation at beginning of the shifts.</p> <p><b>Observation made:</b> - It is observed that the processes and machines required the system at the time of operation to exhaust the fumes for air treatment cycle to remove the toxicity emitted from the process or machines.</p> <p><b>Technical and financial Analysis:</b> The existing 28 nos. Fumes Extractors were installed at Roof of the respective shops. These were started for entire hours of working. The remote switching has been installed to facilitate the machine/ process need basis operation. It resulted Rs.0.95 Lakh saving against implementation cost of Rs.0.22 Lakh.</p> <p><b>Action Taken:</b> - The remote switching stations are made nearby the workstations to</p>

	control excess energy consumed in the existing system. <b>Savings:</b> Rs.0.95 Lakhs <b>Investment:</b> Rs.0.22 Lakhs
8	<p><b>Retrofit and modifications made in compressed air distribution system:</b></p> <p><b>Background:</b> large and old distribution network system involved for compressed air distribution caused heavy losses in the form of leakage and pressure drop.</p> <p><b>Observation made:</b> To meet the existing requirement of manufacturing shops in A Shift &amp; B Shift, it is observed that existing distribution network had leakage and pressure drop resulting extra loading on air-compressors system.</p> <p><b>Technical and financial Analysis:</b> The existing compressed air distribution network system was installed in 1985 –86 when 04 nos. of 180KW centralized air compressors were running. The machines locations and requirements were shifted downward. Hence, low capacity dedicated decentralized air compressors of Elgi/Kirlosker make have been installed bypassing distribution network. The modifications and retrofit made smooth functioning of the Compressed-air system. The implementation cost of Rs.02.35 Lakh has saved Rs. 05.83 Lakh.</p> <p><b>Action Taken:</b> The pressure 07 bar required for the existing network was made possible through modifications and retrofit in distribution network system to improve the efficiency at lesser loading on the air compressors. It also arrested air leakage in the system.</p> <p><b>Savings:</b> Rs.05.83 Lakhs <b>Investment:</b> Rs.02.35 Lkajs</p>

## ENERGY CONSERVATION PLANS AND TARGETS:

Energy conservation is an ongoing process at ITI Limited, Mankapur and Plant is committed for it and always looking for new avenues on continual improvement basis. Following major proposals are in hand as a part of its future plans for energy conservation:

- ❖ Installation of Computerized Energy Monitoring Energy Management System for all production & non-production activities.
- ❖ Replacement of old version of 2X40 KVA, 3X120 KVA UPS of HCB &PCB which is consuming much power by energy efficient UPS
- ❖ Replacement of V-Belts with synthetic belts
- ❖ Replacement of secondary chilled water pumps
- ❖ Off loading of Central Compressed Air Plant by installation of small capacity air compressors
- ❖ Use Exhaust fan controllers
- ❖ Installing VSD (variable speed drives)
- ❖ Retrofit in electric drives by star mode /Use of Energy Efficient Motors
- ❖ Retrofit in Air – conditioning cooling tower by using FRP blades.