

ENERGY CONSERVATION IN AUTOMOBILE INDUSTRIES

BY

T.S.NARAYANAN , DIRECTOR

NPC -MUMBAI

3rd AUGUST 2010

ENERGY CONSERVATION IN AUTOMOBILE INDUSTRIES

- **Energy used**
- **Major Equipments /Departments**
- **Plant utilities**
- **Plant operating characteristics**
- **Energy savings opportunities**
- **Metering Monitoring**

ENERGY CONSERVATION IN AUTOMOBILE INDUSTRIES

ENERGY USED

- **ELECTRICITY**
- **FURNACE OIL**
- **HSD/LDO**
- **LPG/NATURAL GAS**
- **COKE**

ENERGY CONSERVATION IN AUTOMOBILE INDUSTRIES

MAJOR EQUIPMENTS/DEPARTMENTS:

- **MACHINE SHOP**
- **BODY SHOP**
- **PAINT SHOP**
- **ASSEMBLY SHOP**
- **FOUNDRY**
- **HEATING AND MELTING FURNACES**
- **DG sets/ Captive Power Generation**

ENERGY CONSERVATION IN AUTOMOBILE INDUSTRIES

PLANT UTILITIES

- **Air compressors**
- **Cooling water pumps**
- **Chilled water system**
- **Coolant oil system**
- **Hot oils system(Themopacks)**
- **Plant lighting systems**

ENERGY CONSERVATION IN AUTOMOBILE INDUSTRIES

PLANT OPERATING FEATURES

- **FIRST SHIFT - FULL OPERATION**
- **SECOND SHIFT – 60 -70 %**
- **3 RD SHIFT - Heat treatment and essential loads**

ENERGY CONSERVATION IN AUTOMOBILE INDUSTRIES

EFFICIENCY OF MAJOR EQUIPMENTS:

- Transformers : 98-99.5%
- Motors : 85 – 96 %
- Electrical Heating furnaces: above 90 %
- Electrical melting furnaces: 65 %
- Thermo packs : 65- 82 %

ENERGY CONSERVATION IN AUTOMOBILE INDUSTRIES

ELECTRICAL SYSTEMS:

- **Maintaining Average billing power factor as per tariff**
- **Peak power factor improvement as per load monitoring**
- **Relocation of capacitors/ Auto PF panels**

ENERGY CONSERVATION IN AUTOMOBILE INDUSTRIES

ELECTRICAL MOTORS/ DRIVES

- MOTOR LOAD SURVEY
- IDENTIFICATION OF UNDERLOADED MOTORS
- INSTALLATION OF HIGH EFFICEICNY MOTORS FOR SELECT EQUIPMENTS.

ENERGY CONSERVATION IN AUTOMOBILE INDUSTRIES

Cooling water pumps:

- **Estimation of Combined efficiency of pumping system**
- **Estimation of pump efficiency**
- **Replacement of old pumps**
- **Capacity matching as per shift requirements**

ENERGY CONSERVATION IN AUTOMOBILE INDUSTRIES

Air compressors:

- **Estimation of Compressor loading**
- **Review of Compressor capacity Controls**
- **Capacity matching as per shift requirements**
- **Reducing leakages**
- **Segregation of cleaning air requirements**

ENERGY CONSERVATION IN AUTOMOBILE INDUSTRIES

Hot oil systems/ Thermopacks

- **Estimation of combustion efficiency**
- **Combustion efficiency of Thermopacks at Low/ high fire conditions**
- **Review of forward/ Return oil temperature settings**
- **Estimation of thermopack loads**

ENERGY CONSERVATION IN AUTOMOBILE INDUSTRIES

Painting oven/Dryer

- **Review of combustion efficiency**
- **Estimation of WHR potential**
- **Operating economics of energy sources**
- **Process improvements**

ENERGY CONSERVATION IN AUTOMOBILE INDUSTRIES

Heat treatment furnaces:

- **Application of ceramic fiber insulation**
- **Estimation of specific fuel consumption**
- **Review of waste heat recovery potential & WHR systems.**

ENERGY CONSERVATION IN AUTOMOBILE INDUSTRIES

Chilled water / Cooling water systems:

- **Review of chilled water temperature settings**
- **Review of operating efficiency of chiller systems**
- **Estimation of cooling tower effectiveness**

ENERGY CONSERVATION IN AUTOMOBILE INDUSTRIES

Cupola operation:

- **Specific fuel consumption**
- **Warm/ Hot blast cupola**

Induction melting:

- **Delay analysis**
- **Review of holding furnace operations**

ENERGY CONSERVATION IN AUTOMOBILE INDUSTRIES

Core ovens:/ Sand dryers

- **Combustion efficiency improvement**
- **Effective loading of ovens/ dryers.**
- **Planning and scheduling of operation**

ENERGY CONSERVATION IN AUTOMOBILE INDUSTRIES

Plant lighting:

- **Shift wise lighting consumption monitoring**
- **Application of energy efficient lighting systems**
- **Review of lighting controls as per shift requirements**
- **Installation of lighting transformers.**

ENERGY CONSERVATION IN AUTOMOBILE INDUSTRIES

Metering and monitoring:

- **Department wise energy monitoring**
- **Energy Monitoring of major utilities**
- **Operating hour monitoring for air compressors and specific equipments.**

ENERGY CONSERVATION IN AUTOMOBILE INDUSTRIES

THANK YOU