



# Acharya Engineering Services

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## **ENERGY AUDIT FOR ELECTRIC MOTORS**

### ▪ **PREAMBLE:**

In any type of industries, Electrical Motors over period of years, start consuming more power due to following reasons:

1. Weak windings
2. Improper Maintenance
3. Improper Rewinding job
4. Changes in the Load patterns
5. Wrong selection of Motor Ratings

- **NEED FOR ENERGY AUDIT:** Nowadays the Electrical power consumption plays a vital role in manufacturing cost of all type of industry. Due to wear and tear in motors, the Electrical motor tends to draw more power and sometime the ratings of Electrical motors needs to be revisited due to change in load patterns. Further due to rapid innovation, more and more energy efficient motors are available in markets today and this can significantly help in reducing the power consumption. But simply going for this higher grade energy efficient motors will not be of that help and whether the motor is to be replaced or not, can be found out by doing the Energy Audit of the Electrical Motors.

- **HOW IS THE ENERGY AUDIT DONE FOR ELECTRICAL MOTORS:** Following steps are followed for the Energy Audit of Electrical Motors:

- A) Data of Existing Running Motors in the Plant
- B) Analysis of Data of Electrical Motors
- C) Selection of Motors for Power Measurement
- D) Payback Calculations.

- A) **DATA OF EXISTING MOTORS:** First and foremost, requirement for any type of energy audit is the Data of Electrical Motors. We have devised one format for collecting the Data of Electrical Motors ( Refer Annexure-1) wherein the following data can be listed and given to us:

- HP / kW Rating
- Name of the machines
- Location of Motor
- Speed and no of poles
- Voltage
- Full Load Current in Amps
- Mounting

- Type of Motors
  - Make
  - Year of Manufacturing
  - Running period
  - Main or standby motor
  - Percentage loading on Motors
  - Physical condition of motors
- B) **Analysis of Data:** Once the above data is available, it is analysed by us and various data like rating, running hours and recent condition of motors are thoroughly studied.
- C) **Selection of Motors for Power measurement with Power Analyzer:** The particular Electrical motors where it is likely to get lesser payback period are selected for real time power measurement with a power analyser. Here we will need the motors:
- a. To be operated at full capacity.
  - b. There should be ease of connection of probes of Power analyser without taking shutdown of motor either in Panel end or at motor end
- D) **PAYBACK CALCULATIONS:** Power Measurement Data is downloaded from the Power Analyser and stored in Laptop for further calculations. The calculation is done as per the format given in Annexure-2. We will need your current Energy Tariff to calculate the Payback period. Current data of higher efficiency motors of Marathon make available with us is referred for payback calculations.